

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

In the Matter of)	
)	
The Amateur Radio Service:)	RM-10781,
Proposed Changes to the Morse Code (CW))	RM-10782,
Proficiency Requirement for Operator)	RM-10783,
Access to the Amateur Radio Bands)	RM-10784,
Below 30 MHz)	RM-10785,
)	RM-10786, and
)	RM-107873
)	

To: The Commission

**Reply Comments in Rebuttal to Comments of Scott A. McMullen
Made on 3 November 2003 On The Seven Petitions**

I, Leonard H. Anderson, respectfully wish to make some general Comments to Mr. McMullen's comment statements and all others who have made similar remarks in other comments. 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.

Proficiency At Morse Code Leads To Learning Construction Of Amateur Radios

This is a remarkable bit of sophistry. To quote from McMullen's 7th paragraph:

“Clearly, an important activity within the Amateur Service is the acquisition of the skill of designing, constructing, and operating one's own Amateur Radio apparatus. The amateur skilled in the use of the International Radiotelegraph Code is in an excellent position to begin such a program, because of the relative simplicity of the equipment required for radiotelegraph code operation. Simple direct conversion receivers, and two stage crystal-controlled transmitters, are simple to construct and debug; and several are available in kit form, and form an excellent basis from which to advance to the construction and testing of more complex

apparatus, including equipment for the voice and digital modes.”

The common direct-conversion “QRP” receiver (a single local oscillator, difference mixing product direct to audio) **receives AM and SSB as easily as “CW”** without any changes in the circuit. There is no technical advantage in hardware at any stage to be gained by “CW” proficiency.¹ Any simple Class C oscillator-amplifier becomes FM capable with the addition of a single voltage-variable-capacitor in the oscillator tuning circuit. Hardly complex. McMullen is technically incorrect on either statement.

The Commission **already provides the option of equipment use** by not requiring type-accepted radio transmitting equipment.² The only regulations on receivers is that ready-built units may not tune to cellular telephone bands. Other than two minor exceptions this provides an unlimited option of radio equipment kind and origin for any class of amateur licensee.

But, the Commission also makes a number of requirements on technical characteristics of transmitters which must be met regardless of mode of operation or modulation type.³ Those apply to all amateur licensees whether beginner or long-timer. As one who has made a career of designing radio and electronics equipment, or anyone in that same field knows, one cannot just assemble something according to instructions, turn it on, and hope that it meets all technical requirements of sub-part D.

Testing of radio transmitting equipment should be done with a substitute non-radiating load in place of an antenna. Testing involves **knowledge and use of test equipment**, however simple or complex and that has absolutely **no relationship to “CW” proficiency**.

¹ If rejection of signals to either side of the local oscillator is desired, as would be desired for SSB, that applies equally well to “CW” or to AM. That can be done with a Gingell polyphase audio network following a Tayloe mixer. While not as simplistic as a 1920s era crystal set receiver, neither is it complex or difficult to debug.

² Exception is with external RF power amplifier equipment operating below 144 MHz, Title 47 C.F.R. Part 97.315, including inadmissibility of type-acceptance of amplifiers operating between 24 and 35 MHz as stated in Part 97.317.

³ All of sub-part D, 47 C.F.R.

The Commission must assume that all amateur licensees will obey regulations. The Commission need not assume that it must act is the equivalent of a radio construction school. The options for type and kind of equipment is open to all amateur licensees just as all allocated modes and modulation types are optional to use for any amateur licensee. That is a fair and equitable policy in this commenter's opinion and should remain. It should not be suborned by some alleged need to meet "CW" proficiency testing.

McMullen implies that all licensees or those interested in amateur radio are beginners. This is wrong since there already are hundreds of thousands of individuals engaged in radio communications services outside of amateur radio...and most such individuals already possess some knowledge of radio construction and testing. Electrons, fields and waves obey the laws of physics, regardless of the distinction placed on radio service designations by humans.

On The Allegation That Voice Or Data Modes Are Too Complex To Construct Without Morse Code Proficiency, McMullen Paragraph 8

Firstly, there is no real relationship of construction of radios requiring Morse Code proficiency. The construction of any electronic circuit and the testing and calibration (if required) of same requires intellectual knowledge which may be acquired as readily through non-radio-related electronics as with radio communications apparatus. Morse Code proficiency is a psychomotor skill that has minimal intellectual attributes. The two skills are not related in any real way.

Secondly, there is no Commission regulation or implication or definition that all licensees must be able to "design and construct" any radio. The Commission gives all licensees that option, imposes no mandate, no specific tests on such skills. That option and freedom should be retained without qualifier other than the existing external power amplifier conditions of Parts 97.315 and 97.317.

As to complexity, a large number of relative beginners have, in the past, constructed many and

varied kits ranging from music systems and color television receivers and other items of electronics rather more complicated than single-sideband voice radios.⁴ Electronics kits are no substitute for design knowledge, but do serve satisfactorily as reduced-cost projects which give the assembler practical knowledge in wiring and construction of circuitry. Design is something that requires a great deal more intellectual skill than simplistic advanced-scouting merit-badge-style “radios.”

Morse Code proficiency is **not an intellectual skill** and has never been such since the first telegraph line in the United States was put into operation in 1844, Baltimore, Maryland, to Washington, D.C., 159 years ago. Morse Code proficiency is a psychomotor skill, nothing else. Morse Code proficiency was once required back in early days of primitive radio when the only means of communications over radio was by on-off keying. Those days are long past and the technology of electronics and radio has advanced far beyond simple crystal sets and spark transmitters.

On The Alleged Regulations’ Evaluation Of License Applicants, McMullen paragraph 2

McMullen states that *“The licensing requirements should evaluate the readiness of the applicant to join the Amateur Radio Service in support of the ‘Basis and Purpose’ of that Service.”*

First, applicants in a license examination session are there to test for joining the amateur radio service. That has been the general condition since the first United States radio regulating agency came into being in 1912 and has continued to this day. Such should be obvious.

The Commission is tasked with regulation of all United States civil radio. As part of that task the Commission requires radio operator licenses for most U. S. civil radio services. A radio operator license is a grant from the Commission that allows operation of a radio frequency emitter under regulations

⁴ Heath Company, Benton Harbor Michigan, well-known for their many Heathkits sold for over three decades beginning in the early 1950s. Those included amateur radio equipment from the simple through the full-function, multi-band HF transceivers of several “generations” of models.

established by the Commission in Title 47 Code of Federal Regulations. That license is in no way an academic document nor is it a certificate of psychological condition as to the applicants' willingness to do anything. Abiding by regulations is a specific requirement of law, common to all laws.

McMullen quotes Title 47 C.F.R. §97.1 (d): "*Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.*" That definition does not single out Morse Code or any other communications mode as a requirement of "trained operators." Since technology knowledge and expertise is an intellectual skill and Morse Code is a psychomotor skill, Morse Code proficiency cannot equate with either "technicians" or "electronics experts."

The "existing reservoir" of Morse Code proficient amateur radio operators have little application to other United States civil radio services. Of those others, only Maritime Radio Services in the United States have requirements for Morse Code operators and proficiency.⁵ The United States military has no need for Morse Code modes in any tactical communications.

Morse Code was put into regular communications 159 years ago. It matured as a skill over a century ago, before the first demonstrations of radio as a means of wireless communications. There is no real advancement of any state of any communications art in the use of Morse Code, nationally or internationally, by radio or other communications means.⁶

⁵ Part 80, Title 47 C.F.R. The international maritime world adopted the Global Marine Distress and Safety System to replace the old Morse Code emergency call on the international distress frequency of 500 KHz. The United States Coast Guard no longer monitors that frequency.

⁶ Basically, Morse Code began as a series of on-off states representing the letters, numbers, and some punctuation of the English language. Many other languages have more letters than the 26 in English and those countries adapted and modified the original Morse Code to fit their written language. That and various occupations involving communications caused a variation in the representation of characters but not the basic on-off impulses of the representation. There was no "state of the art" in the technology of telegraphy caused by variations of character representation. The adoption of International Morse Code as defined in Part 97.3 of Title 47 C.F.R. is to provide an international standard character representation set to enable all amateur radio operators to communicate worldwide. Standardization is a practicality matter, not any increase in technological arts of communications.

A Summary And Conclusion

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. 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. The Morse Code test has proved its worth in the past. We no longer live in that past. 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 3rd day of November, 2003.

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