Before the

FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Amendment of Parts 2, 25, and 73 of the Commission's Rules to Implement Decisions from the World Radiocommunication Conference (Geneva, 2003) (WRC-03) Concerning Frequency Bands Between 5900 kHz and 27.5 GHz and to Otherwise Update the Rules in this Frequency Range	)	**ET Docket No. 04-139**

To: The Commission

COMMENTS of Nickolaus E. Leggett
Electronics Technician and Amateur Radio Operator

The following is a set of comments from Nickolaus E. Leggett, an amateur radio operator (Extra Class licensee – call sign N3NL), inventor (U.S. Patents # 3,280,929 and 3,280,930 and one electronics invention patent application pending), and a certified electronics technician (ISCET and NARTE). I also have a Master of Arts degree in Political Science from the Johns Hopkins University (May 1970).

My comments are directed at the proposals in this Notice of Proposed Rulemaking (NPRM) that apply to the high frequency broadcasting (HFBC) service. HFBC is also known as short-wave broadcasting.

Use of Double Sideband Transmission

The Notice of Proposed Rulemaking includes the statement: "The effect of these proposals would be to grant U.S.-licensed international broadcast stations the flexibility to continue to transmit analog DSB signals or to transmit SSB or digital signals,

including DRM signals (currently the only ITU-recommended digital standard for use in HFBC bands), which would allow international broadcast stations to provide FM-like sound quality to listeners in foreign countries." (Paragraph 19 on Page 9)

I strongly support allowing U.S. short-wave broadcasters the option of continuing to broadcast using double sideband (DSB) transmission. Double sideband is traditional amplitude modulation (AM) transmission where a carrier wave and two sidebands of frequencies transporting audio information are sent over the air. At the listeners' receivers, the sidebands and the carrier wave mix to output the original audio information.

DSB is particularly valuable because it allows very simple radio sets (receivers) to receive the HFBC broadcasts. This vital advantage is not available to the single side band (SSB) or digital modes of broadcasting.

Single side band (SSB) uses a single sideband range of frequencies to transmit the audio program. The carrier wave can be omitted entirely or it can be transmitted. If the carrier wave is omitted, a complex multi-stage superheterodyne radio receiver is required including a special oscillator that reinserts a carrier wave to detect the audio information. If the carrier wave is transmitted, the listener can use a less complex radio receiver.

Digital HFBC broadcasting requires special circuitry to be used in each listener's receiver.

Double Sideband and Third-World Listeners

Many listeners to HFBC broadcasts are residents of nations where the standard of living is much lower than it is in the United States. Many of these people are fairly poor or almost poor. They can use quite simple radio receivers to listen to DSB short-wave

broadcasts. In many cases, a very simple radio using a diode detector stage followed by a one-transistor audio amplifier stage is sufficient. This means that a simple and inexpensive transistor radio is suitable for listening to the fairly strong (50 KW) short-wave broadcasts. This maximizes the potential audience for any HFBC broadcast.

In contrast, SSB and digital broadcasting requires the use of more complex radio receivers that are more expensive to purchase and to service.

In addition, DSB (amplitude modulation) broadcasts can be received on homemade or improvised receivers. This is especially useful in totalitarian and dictatorial regimes where short wave listening is restricted or banned. In such regimes, people can construct their own receivers to learn about the outside world. For example, during World War 2 in occupied France, people built improvised radios hidden into doorframes. These radios used salvaged parts and improvised diode detectors to produce the audio signal.

United States Foreign Policy and DSB Broadcasting

DSB broadcasts support the goals of United States foreign policy by making American program material available to a diverse listening audience throughout the World. This audience includes people of limited economic means and people trapped in dictatorial societies. When regimes such as the Taliban shut down free media, DSB broadcasting is often the only means to hear news and program material from the outside world. In the case of the Taliban, short-wave DSB broadcasting made the forbidden art of music available to people who were otherwise cut off from it.

The program material transmitted by HFBC increases overseas knowledge of America and our democratic values.

Children and Double Sideband Short-wave Broadcasting

There is another, less visible, benefit to DSB broadcasting. Children throughout the World are introduced to foreign cultures by short-wave broadcasting. In addition, children first learn about electronics technology by building their own very simple short-wave radios. In general, children are not going to have access to expensive SSB or digital radio receivers. However, they often will have the resources to build their own very simple receiver that can receive powerful DSB broadcasts. Indeed, it has been demonstrated again and again that a simple crystal set (using a diode but no amplification at all) can be used to receive international DSB broadcasts.

Digital Broadcasting

HFBC broadcasters should be allowed to use digital broadcasting technology if they judge that it will be useful. However, they should not be required to purchase transmitters that are digital-capable. Rather, we should leave it to the World marketplace to decide when or if international digital broadcasting is a suitable mode.

Many people have commented that the Digital Radio Mondiale (DRM) technology works quite well in broadcasting high-quality audio program material to especially equipped receivers. For example, refer to the article "Digital Radio Mondiale" in the October 2003 issue of **QST** magazine (published by the American Radio Relay League, Inc. in Newington, CT). In this article, Steve Ford of the ARRL staff describes retro fitting an older short-wave receiver with the circuitry and software for DRM reception. Ford reports excellent audio quality when receiving foreign DRM transmissions.

It is likely, that the DRM technology will see increased use as the World becomes more affluent and digital short-wave broadcasting increases. As the market grows, more short-wave broadcasters will purchase the equipment required to transmit DRM signals. The fact that DRM transmits music very well will increase its appeal to both the listeners and to the broadcasters themselves.

Power Levels for Broadcasting

The effectiveness of DSB short-wave broadcasts to very simple radio sets is partly due to the high power transmitters (50 KW) that are used. The signals are quite strong even at international distances and so a simple receiver works quite well. Even music is reproduced at an AM level of quality although some fading often occurs. The current 50 KW requirement should be maintained for DSB transmission.

SSB transmissions are generally more efficient than DSB transmissions. Thus a lower minimum power can be allowed for SSB operation. However, the power level selected should be such that the SSB signal will at least be equivalent to a DSB signal over the same signal path from transmitter to listener.

Suggested Actions

The Commission should continue and enact its proposed rule that will allow HFBC broadcasters to transmit DSB signals as well as SSB and digital signals. DSB has the numerous advantages that have been described in these comments.

The Commission should consider that HFBC broadcasting has important foreign policy implications and that DSB broadcasting directly supports U.S. foreign policy goals of fostering democratic values and open societies.

Respectfully submitted,

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