



PUBLIC NOTICE

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MEDIA BUREAU TO PERMIT USE OF ENERGY-SAVING TRANSMITTER TECHNOLOGY BY AM STATIONS

By this *Public Notice*, the Media Bureau (Bureau) announces that it will permit AM stations to use transmitter technologies that reduce power consumption while maintaining both audio quality and licensed coverage areas. Such technologies, known generally as Modulation Dependent Carrier Level (“MDCL”) control technologies or algorithms, have long been used by international broadcasters operating high-powered AM transmitters. Easier implementation of MDCL algorithms and higher energy costs have recently made these techniques more attractive to domestic broadcasters. Use of MDCL technologies requires a waiver of Section 73.1560(a) of the Commission’s Rules,¹ which sets upper and lower limits for an AM station’s operating power. We hereby establish procedures for AM broadcasters to seek a rule waiver in order to use energy-saving MDCL technologies.

Transmitter manufacturers have developed different techniques to reduce carrier power as the audio content varies. During the 1980s, several European broadcasting and manufacturing concerns developed algorithms to reduce power consumption by radio transmitters.² These algorithms, known variously as Dynamic Amplitude Modulation, Amplitude Modulation Compadding, Adaptive Carrier Control, or Dynamic Carrier Control, decrease carrier power by amounts up to 6 dB, with the power reductions applied at different modulation levels depending on the algorithm. Today, among manufacturers of AM transmitters for domestic use, Harris Corporation offers both Amplitude Modulation Compadding (AMC) and Adaptive Carrier Control (ACC) features for all its current AM broadcast transmitters,³ and can add the feature to some older transmitters. Nautel Limited includes an option called Dynamic Carrier Control (DCC) on all NX series transmitters, and can also install DCC on other transmitter models.⁴ If other manufacturers of AM broadcast transmitters develop similar technology in the future, we will consider waiver requests for its implementation using the same procedures described herein. The potential for energy savings depends upon the particular technology and its configuration, and also upon the program content. In typical cases, the power consumption of an AM transmitter can be reduced by 20 to 40 percent.

¹ 47 C.F.R. § 73.1560(a).

² The British Broadcasting Corporation developed Amplitude Modulation Compadding, the German firm AEG Telefunken (now Transradio) developed Dynamic Amplitude Modulation, and the Swiss ABB Group developed Dynamic Carrier Control.

³ See *ACC Technical Manual, Harris Corporation*, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-309538A2.pdf, and *AMC Technical Manual, Harris Corporation*, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-309538A3.pdf.

⁴ See Letter from Nautel Limited, August 4, 2011, and “*Energy Conservation in AM Broadcast Transmitters Using Carrier Control Algorithms*,” NAB Broadcast Engineering Conference, April 2009, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-309538A1.pdf

The reduction in AM signal power at certain modulation levels inevitably exacts some penalty upon audio quality. Depending on the content of the audio program, MDCL algorithms may introduce some audio distortion or may decrease the signal-to-noise ratio in the receiver. In addition, MDCL algorithms may erode coverage slightly at the fringes of the AM station's protected service area. Both the long experience of transmitter manufacturers and broadcasters abroad, and the initial reports from experimental operations in Alaska⁵, however, indicate that such adverse effects are generally imperceptible. The Harris ACC, Harris AMC, and the Nautel DCC options which are currently available allow the AM broadcaster to adjust the power-reducing algorithm in order to minimize effects on the quality of the broadcast signal. Based on the available record, we believe it is appropriate to permit broadcasters to use MDCL technology on a voluntary basis.

Occasionally, AM stations perform field strength measurements on their own signals or on those of nearby stations for allocation purposes.⁶ Although use of MDCL technology does not have a significant effect on most consumer receivers within an AM station's coverage area, it is possible that field strength readings could be affected. Therefore, we encourage licensees and engineers to ensure that MDCL technology is disabled before commencing field strength measurements. We expect licensees to cooperate with field strength measurement programs by other stations.

The National Radio Systems Committee has recently convened a subcommittee to investigate the effects of MDCL technologies on the hybrid IBOC AM signal, especially at the receiver. Initial tests by manufacturers have demonstrated that MDCL operation is compatible with hybrid IBOC transmission at the transmitter, including full compliance with the AM IBOC RF spectral mask requirements. Tests of the compatibility of MDCL with hybrid AM IBOC on various types of receivers are underway. We will permit AM stations broadcasting in hybrid AM IBOC mode to implement energy-saving MDCL technology provided the hybrid signal continues to comply with spectral emissions mask requirements in Section 73.44,⁷ and also provided that the relative level of the analog signal to the digital signal remains constant.

AM licensees who wish to implement MDCL technology shall file with the Audio Division a letter requesting waiver of Section 73.1560(a) of the Rules, addressed to:

MDCL Waivers
Federal Communications Commission
Audio Division, Media Bureau
445 12th Street SW, Room 2-B450
Washington, DC 20554

A copy of the request, preferably in .pdf format, shall be sent by e-mail to Ann.Gallagher@fcc.gov. The letter shall specify the technology the licensee plans to use and discuss its implementation at the licensee's station. Upon favorable consideration of the letter request, the Audio Division will issue a modified station license indicating that a waiver has been granted to permit use of a specific MDCL technology, resulting in the variation of transmitter power to levels below 90 percent of the station's nominal licensed power.⁸ We will require, however, that the transmitter achieve full licensed power at

⁵ See, e.g., staff letter of June 24, 2010, to KOTZ, Kotzebue, Alaska (Facility ID No. 35440) granting experimental authorization to use DCC technology, and the associated engineering report.

⁶ 47 C.F.R. § 73.153.

⁷ 47 C.F.R. § 73.44.

⁸ Use of MDCL algorithms does not increase the likelihood of transmitter power exceeding the upper limit (105 percent of licensed power) specified in 47 C.F.R. § 73.1560(a).

some audio input level, or when the MDCL is temporarily disabled. This requirement will permit stations to use energy-saving MDCL technologies, which preserve licensed coverage areas, while distinguishing between such operations and simple reductions in transmitter power, which do not. We will also continue to authorize experimental operations pursuant to Section 73.1510 of the Rules⁹ for stations who wish to evaluate MDCL technology. Requests for experimental authority pursuant to Section 73.1510¹⁰ require only an informal application, typically a letter, and include no fee or form. Although licensees operating under experimental authorizations are normally required to file a report with the Commission, we will not require reports from stations evaluating MDCL technology.

For additional information, contact Ann Gallagher or Susan Crawford of the Audio Division at (202) 418-2700, or e-mail Ann.Gallagher@fcc.gov.

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⁹ 47 C.F.R. § 73.1510.

¹⁰ *Id.*