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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
Room 222, Mail Stop 1170
Washington, DC 20554

Re: Petition for Rule Making to Amend Section 15.225 of the Commission's Rules

Dear Ms. Salas:

On behalf of the National Council for Information Technology Standardization Technical Committee B10 ("NCITS B10"), I am submitting the enclosed Petition for Rule Making asking the Commission to amend Section 15.225 of the Rules to bring the provisions pertaining to radio frequency-based identification cards and related devices that operate at 13.56 MHz into closer harmony with the standards for such devices proposed by the European Telecommunications Standards Institute.

NCITS B10 urges the Commission to move forward promptly in its consideration of this petition. We appreciate the interest in this matter shown by the Commission's staff and look forward to working with the Commission in this effort to offer the advantages of new technologies to American consumers and to facilitate world trade through the implementation of compatible standards.

Sincerely,

Dr. Joseph VJ Ravenis II
Chair, NCITS B10.5
9333 Balboa Avenue
San Diego, CA 92123

Enclosure
cc (w/encl.): Mr. Dale Hatfield, Mr. Julius Knapp,
Ms. Karen Rackley, and Mr. John Reed - OET
Mr. Joseph A. Naujokas - Chair , NCTIS B10

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Before the
Federal Communications Commission
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of Amendment of Section 15.225 of the Commission's Rules to Facilitate the Operation of Short-Range Devices in the 13.56 +/- 0.007 MHz Band	RM No.

Petition for Rule Making

The National Council for Information Technology Standardization Technical Committee B10 ("NCITS B10") respectfully asks the Commission to issue a notice of proposed rule making to amend Section 15.225 of the Rules, 47 C.F.R. § 15.225 (1997), to adjust the field strength limits set forth in the U.S. requirements to conform more closely to those proposed by the European Telecommunications Standards Institute ("ETSI"). The proposed change will remove a burden imposed by the current rules without undermining the efficacy of the existing regulations as a means for managing spectrum in order to prevent interference.

NCITS B10 is accredited by the American National Standards Institute ("ANSI") to develop national standards for "Identification Cards and Related Devices". "NCITS B10" also serves as ANSI's technical advisory group to represent the United States on the ISO/IEC Joint Technical Committee 1, Subcommittee 17 ("ISO/IEC/JTC1/SC17"), which develops international standards for Identification Cards and Related Devices.

Background

Worldwide, many different companies are developing technology for use in systems designed to employ contactless inductive responders. These devices, sometimes known as cards, tags, or transponders (hereinafter "cards" or "devices") are used as part of radio frequency identification systems (RFID) for a host of applications that enhance the efficiency of a wide variety of operations in transportation, manufacturing, retail sales, and access security. Operating over a relatively short range of a few inches to a few feet, these devices utilize the magnetic field (the H field) that is one component of a radio frequency signal. In typical applications, these systems transfer electrical power to a batteryless card by coupling energy from the reader to the card by induction.[1] Either simultaneously with the powering function or following the transmission of power to the card, the reader may send information to the card by a modulated radio signal. The card can then respond either in a full, half duplex or simplex mode to convey information to the reader. In most cases, the information will involve a unique identification number associated with the card. Additional information can be included at the system developer's option.

ANSI's NCITS B10 represents the United States on the ISO/IEC/JTC1/SC17 committees for ISO contactless cards, which are responsible for drafting ISO 14443/15693, the international standards for contactless integrated circuit cards such as proximity coupling cards ("PICC") (also known as "smart cards") and vicinity coupling cards ("VICC"). ANSI's NCITS also represents the United States on the ISO/IEC/JTC1/SC31, for item management. Both ISO standardization subcommittees SC17 and SC31 deal with the inductive card technology.

[1] While such systems could operate in various parts of the spectrum, the 13.56 +/- 0.007 MHz band with its comparatively high field strength provides for both efficiency and relatively low costs as compared to operations in other portions of the spectrum.

The Current U.S. Regulations

The spectrum within the band 13.56 +/- 0.007 MHz is set aside for use as an Industrial, Scientific and Medical ("ISM") band.[2] Thus, these are portions of spectrum in which high noise levels from unlicensed equipment may be emitted.

Under Section 15.225 of the Commission's Rules, this band may also be used by unlicensed communications devices with a relatively high field strength limit of 10,000 uV/m at 30 meters (*i.e.* 80 dBuV/m at 30 meters). Section 15.225(b) provides that the "field strength of any emission appearing outside of this band shall not exceed the general radiated emission limits shown in Section 15.209" of the FCC Rules. While Section 15.209 sets forth general radiated limits, it also refers to Section 15.205 of the Rules, which provides that only *spurious* emissions may fall within the restricted bands listed in Section 15.205(a). These include the 13.36 - 13.41 MHz radio astronomy band.

The greatest practical problem with applying the current regulations to PICCs and VICCs operating in the 13.56 +/- 0.007 MHz band lies in the definition of *spurious emission*. Although in common technical parlance, the term *spurious emission* generally means any unwanted emission, the legal definition is far more specific and limited. As set forth in Section 2.1 of the FCC Rules, the term *spurious emission* includes an

> [e]mission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

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[2] ISM bands are set aside for the operation of devices that employ radio frequency energy for purposes other than communications such as heating, the transfer or power, or the transformation of materials. *See generally* 47 C.F.R. § 18.101 *et seq.* (1997). Within the ISM bands, the amount of energy that may be emitted is generally not limited. There are, however, limits applicable to out-of-band emissions.

In the design of short-range device systems, the most challenging aspect of compliance with the Part 15 requirements lies not in suppressing undesired emissions, but rather with the characterization of these emissions as *spurious emissions.* In practice, the emissions most likely to fall within the restricted band of 13.36 - 13.41 MHz are more likely to be deemed to be "out-of-band emissions" produced as products of the modulation applied within the 13.56 +/- 0.007 MHz band.

Section 2.1 of the FCC Rules defines *out-of band emissions* as consisting of an

> [e]mission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

In determining whether the energy that falls into a restricted band is a *spurious emission* or an *out-of-band* emission, the term "necessary bandwidth" as defined in Section 2.1 of the FCC Rules must be considered. *Necessary bandwidth* is defined as

> [f]or a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

Thus, while it is possible to define arbitrarily the performance limits of a system so that emissions falling into the 13.36 - 13.41 MHz band would be construed as *spurious*, to do so would turn the application of Section 15.205 into a semantic exercise in order for certain emissions to be classified as *spurious* instead of *out-of-band.* [3]

If short-range systems are to be developed for use in the United States in the 13.56 +/- 0.007 MHz band in a manner that is compatible with other applications worldwide, the Part 15 regulations should be revised to guard against interference without forcing the sort of "fine line

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[3] Using the formulae set forth in Section 2.201 of the FCC Rules, one can calculate the necessary bandwidth, but even this approach effectively mandates an arbitrary limit on modulating frequency. Moreover, not all emissions are readily accommodated by the formulae set forth in the rules.

drawing" inherent in the distinction between *spurious* and *out-of band* emissions as applied in this situation.[4] Indeed, in the licensed mobile services, the FCC Rules do not distinguish between *spurious* and *out-of-band* emissions in the treatment of *unwanted emissions*. Instead, the rules prescribe an emissions mask and require that unwanted emissions be attenuated in accordance with the mask.[5] This approach makes sense because to the victim receiver the unwanted emission is noise, regardless of its characterization.

The European Standards

The draft standards for short range devices recently released by the European Telecommunications Standards Institute (ETSI) set forth a limit of 84 dBuV/m at 30 meters for the carrier of devices operating in the 13.56 +/- 0.007 MHz band and 50.5 dBuV/m at 30 meters for the modulation portion of the signal falling outside of the ISM band. Thus, the proposed standard limits emissions outside the 13.56 +/- 0.007 MHz band to 50.5 dBuV/m at 30 meters[6] (*i.e.* 334 uV/m at 30 meters) versus the 29.5 dBuV/m respectively (*i.e.* 30uV/m at 30_meters) of the current U.S. regulation. It is noteworthy that the ETSI draft standard, like the rules applicable to U.S. licensed services, does not set forth a different limit for *out-of band* and *spurious* signals.[7] Instead, it simply applies the emissions mask referred to above.

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[4] This petition addresses only the situation involving equipment designed to operate in with carriers in the 13.56 +/- 0.007 MHz band.

[5] *See e.g.*, 47 C.F.R. §§ 22.359, 24.133, 24.238, and 90.210 (1997).

[6] Electromagnetic Compatibility and Radio Spectrum Matters (ERM) Short Range Devices; Technical Characteristics and Test Methods for Radio Equipment in the 9 kHz to 25 MHz Frequency Range and Inductive Loop Systems in the Frequency Range 9 kHz to 30 MHz, European Telecommunications Standards Institute, prEN 300 330 v1.2.1 (1998-02), Table 2b. The ETSI magnetic field limits have been expressed as electric field limits using the conversion factor set forth in prEN 300 300 (*i.e.* $E_{field} = H_{field} + 51.5$ dB). *Id.* at ¶ 7.2.1.2. A comparison of the current FCC limits and the limits set forth in the ETSI draft standard is set forth in Attachment 1 to this Petition.

[7] *Id.* Consistent with the International Radio Regulations, the ETSI proposal defines *spurious* emissions as "emissions other than those of the carrier and sidebands associated with normal test

(Continued...)

The Australian Standard

The Australian standard, which was issued in 1996, is based on an earlier version of the ETSI standard and provides for RFID transmitters operating in the band 13.56 +/- 0.007 MHz to be subject to an H field limit of 63.5 dBuA/m at 10 meters with an eirp of 1 watt and spurious emissions of 1 uW eirp (*i.e.* 30 dB below the maximum permitted eirp level).[8] This equates to an H field limit at 30 meters of approximately 53.5 dBuA/meter. The E field limit would be 114 dB uV/m at 10 meters, 105 dBuV/m at 30 meters, for the fundamental emission. Thus, the Australian limit within the band is much greater than the ETSI limit.[9] As such, devices built for the European market can be expected to comply with the Australian requirements even though not operating at the maximum permitted field strengths in Australia. The same would hold true for devices built under the regulations proposed in this petition.

Proposed Revision of Section 15.225

The U.S. regulation should be revised to address the international compatibility problems inherent in the authorization of short-range devices such as PICCs and VICCs under Section 15.225. The revision should focus on the limit within the 13.56 +/- 0.007 MHz band and emissions falling outside of that band. The revised limits should be compatible with the ETSI limits so as to foster international harmonization even though the proposed out-of-band limits requested herein are not as high as the proposed ETSI limits. The Commission should also take this opportunity to codify its practices with respect to approval of the devices (*i.e.* the actual

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(...Continued)
modulation..." *Id.* at ¶ 7.4.

[8] Radio equipment systems- Short range devices, Part 1: Technical characteristics and test methods for radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz, AS 4268.1-1996, at 41, Table ZZ1.

[9] At 10 meters, the proposed ETSI limit within the band 13.56 +/- 0.007 MHz is 42 dBuA/m.

VICC or PICC). Accordingly, NCITS B10 urges the Commission to revise Section 15.225 to read as follows:

§15.225 Operation within the band 13.553-13.567 MHz.

(a) The field strength of any emissions within this band shall not exceed 15,848 microvolts/meter at 30 meters (i.e. 84 dBuV/m at 30 meters or 32.5 dBuA/m at 30 meters in the case of magnetic field measurements).

(b) The field strength of any emissions appearing outside of this band shall not exceed 334 uV/m at 30 meters within the band 13.410 - 13.710 MHz (i.e. 50.5 dBuV/m at 30 meters or -1 dBuA/m at 30 meters in the case of magnetic field measurements).

(c) The field strength of any emissions appearing outside of the band 13.410 - 13.710 MHz shall not exceed 106 uV/m at 30 meters (i.e. 40.5 dBuV/m at 30 meters or -11 dBuA/m at 30 meters in the case of magnetic field measurements).

(e) The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of inductively powered tags designed to operate with a device authorized under this section, the tag shall, at the option of the applicant for equipment authorization, be approved with the device or be considered as a separate device subject to its own authorization.

The revisions sought in this petition would increase the limit within the 13.56 +/- 0.007 MHz band by about 4 dB to make the limit identical to that of the proposed ETSI standard.[10] The requested changes would also create an emissions mask (with a limit of 334 uV/m at 30 meters vs. the current 30 uV/m at 30 meters) that would accommodate out-of-band emissions immediately adjacent to the 13.56 +/ 0.007 MHz band in the same manner as the ETSI standard.

[10] See Attachment 1 for a comparison of the requested limit to the proposed ETSI limit and various other limits.

The 334 uV/m level, however, is only 2.5 dB higher than the limit that applies to out-of-band emissions under Part 18 of the FCC Rules. At the same time, the emissions falling into the astronomy band or any other restricted band would be subject to a limit of 106 uV/m, which is still 7.5 dB lower than the general U.S. ISM out-of-band limits.

The proposed limits are conservative. Thus, in recognition of the U.S. restricted band this petition proposes a mask that would step down the level of emissions outside of the 13.410 - 13.710 MHz band to a level that is about 10 dB lower than the proposed ETSI standard. Moreover, the United Kingdom has employed for at least ten years a level for emissions out of the 13.56 +/- 0.027 MHz band that is approximately the same as the -1 dBuA/m at 30 meters H field limit that ETSI proposes.[11] Thus, even the proposed ETSI level has been long used in a congested RF environment populated by a variety of other users similar to what would be expected in the United States. Accordingly, an increase in the U.S. out-of-band limit, albeit to a lower level than that proposed by ETSI, would be reasonable.

The provision set forth above in draft Section 15.225 (d) would accord system designers the flexibility to include the card within the authorization for the reader. Such a change would codify the current practice. At the same time, providing for a separate authorization for the responder device could foster competition in the provision of devices designed to work with multiple readers.

Rationale

Bringing the U.S. regulations governing operations at 13.556 +/- 0.007 MHz into greater, though not identical, conformity with European standards would serve the

[11] The UK limit is 1,000 uV/m at 10 meters outside of 13.56 MHz +/- 0.2%, which is equivalent to approximately -0.5 dBuA/m at 30 meters. Department of Trade and Industry, *Performance Specification, Low Power Devices*, MPT 1339 (January 1987), Para. 4.1.3.

public interest by helping to establish a framework within which globally compatible RF identification systems could be developed. NCITS B10 recognizes, however, that global compatibility and the enhanced trade and lower device costs likely to arise from such a measure do not resolve all the of the concerns that the Commission is likely to have. Any change of this nature should also provide for a reasonable measure of compatibility with other potentially affected users of the spectrum.

From the standpoint of the amount of noise now permitted to emanate from operations within the ISM band to spectrum outside of the ISM band, the proposed change represents a modest step. Thus, the general limit for out-of-band emissions from ISM devices operating in the 13.56 +/ 0.007 MHz band is 25 uV/m at *300* meters, which is far in excess of the general Part 15 limit of 30 uV/m at 30 meters.[12] If one assumes an attenuation factor of only 20 dB per decade, the field strength of unwanted emissions outside of the 13.56 +/- 0.007 MHz band produced by ISM devices within that band would be 251 uV/m at 30 meters. This would be about 2.5 dB less than the ETSI proposal of 334 uV/m (*i.e.* 50.5 dB uV/m). If a factor of 40 dB per decade were employed, the ISM noise allowed at 30 meters would be 2500 uV/m (*i.e.* 68 dB uV/m), which is far greater than the ETSI proposal.[13]

In short, the proposed change would be consistent with the current FCC limitations applied to noise from ISM devices, which are accorded primary status in the 13.56 +/- 0.007 MHz band. As such, the maximum out-of-band noise from a reader designed to interrogate a card would not exceed that now permitted for a wide variety of ISM equipment. Thus, the proposed change would not only foster international harmony

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[12] 47 C.F.R. §18.305(b) and § 15.209(a) (1997).

[13] A factor of 40 dB per decade is allowed by Section 15.35(f)(2), 47 C.F.R. § 15.35(f)(2) (1997).

in standards for equipment of this type, it would also more closely reconcile for this spectrum the noise limits of Part with those of Part 18 of the Commission's Rules.

Finally, the change sought in this petition would be compatible with existing radio services. Attachment 2 sets forth an analysis that addresses the likely effect of the proposed change on other spectrum users.

Conclusion

By issuing a notice of proposed rule making calling for the amendment of Section 15.225 in the manner set forth herein, the Commission will be fulfilling its statutory mandate to foster the development of beneficial technology. The proposed changes will facilitate both the domestic use of this technology and its export for use around the world.

Respectfully submitted,

NATIONAL COUNCIL FOR INFORMATION TECHNOLOGY STANDARDIZATION * TECHNICAL COMMITTEE B10, IDENTIFICATION CARDS AND RELATED DEVICES.

*Accredited by American National Standards Institute

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NATIONAL COUNCIL FOR INFORMATION TECHNOLOGY STANDARDIZATION * TECHNICAL COMMITTEE B10.5, IDENTIFICATION CARDS AND RELATED DEVICES, CONTACTLESS IC CARDS.

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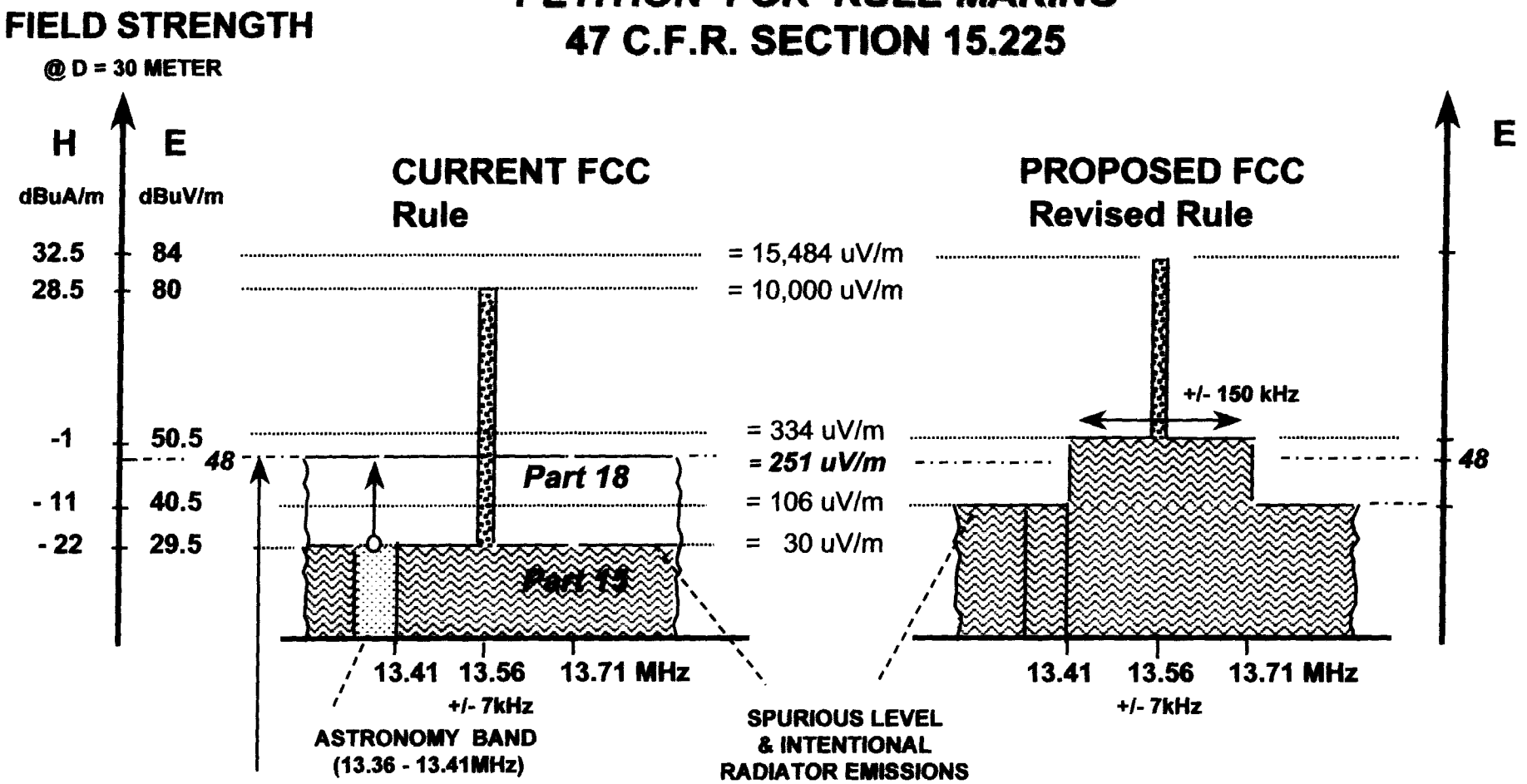
August 27, 1998

SOURCE: ANSI NCITS, B 10.5
REFER.: ISO/IEC JTC1/SC17/WG8/TF2,TF3 ISO14443, 15693

PURPOSE: International Harmonization of Radio Regulation with ETSI EN 300 330

Attachment 1
PETITION FOR RULE MAKING
47 C.F.R. SECTION 15.225



48 dBuV/m EQUALS PRESENT SPURIOUS LEVEL OF SECTION 18.305(b): 25uV/m @ d=300m AS CALCULATED TO 30m WITH 20dB/DECADE ROLL-OFF

COMPATIBILITY ASSESSMENT of RFID SYSTEMS with Other Spectrum Users

RFID systems operating in the 13.56 +/- 0.007 MHz band must exist compatibly with a host of other spectrum users. This attachment examines the likely effect on other spectrum users. Where appropriate, the effects of other users on RFID systems are also addressed. The following categories of other users are considered: ISM uses, Fixed Services, the Amateur Service, Maritime Services, Aeronautical Services, Radio Astronomy, Citizens Band, and other Part 15 RFID systems.

Considering all of the following cases and the possible interaction with RFID Systems, only the RFID reader with its interrogation and its modulation signal can potentially cause interference. This is because the transponder signal is approximately 80 to 100 dB lower than the reader's interrogation signal. At a distance of 5 meters or less, the transponder signal will fall below the terrestrial noise.

To assess the probability of potential interference or compatibility, note that RFID technology will primarily be used in high volume applications such as product coding in warehouses or baggage control applications. This means that the ratio of readers to transponder is on the order of 500 to 10,000 to one. Moreover, the vast majority of readers are likely to be of a handheld type similar to bar code scanners. Their power levels can be expected to be far below the maximum allowed levels because they will be battery powered, designed for short range communications and utilize small antennas. Only in installations with large antennas such as those used in baggage sorting at airports will the maximum power allowed be likely to be emitted.

To cause Interference, several factors must come together. These include

- co-location,
- timely coincidence,
- power levels,
- victim receiver antenna position / directivity relative to the RFID installation, and
- free propagation of the interference source.

ISM band users

RFID → ISM

ISM band equipment is not used for radio communications and thus does not have provisions for receiving. Accordingly, inductive RFID readers with 10 mW of output power will not affect the ISM band users. (Note that the 9dBuA/m limit –outside of the ISM bands- at 10 meters works out to approximately 37 uW ERP.)

ISM → RFID

RFID devices in the 13.56 +/- 0.007 MHz band have a maximum operating range of approximately 1 meter and the induced voltage is some 2 Volts in the near field reading area. This high near-field field strength is not likely to be exceeded by nearby ISM equipment.

Fixed Services

RFID → Fixed Services

These are primarily point-to-point links or point to multipoint links. Such fixed services operating in the shortwave range are intended for long range transmissions that are often government applications designed for international communications. These use high gain directional antennas at elevated positions, unlikely to be influenced by inductive RFID. As a general principle such areas are not likely to coincide with the presence of RFID devices. The antenna directivity will attenuate the potential RFID interference signal into fixed service receivers versus the desired signal.

Fixed Services → RFID

By definition, the RFID and similar systems that operate under Part 15 must accept interference. Typical RFID systems have placed the data return signals from the tag or card outside the ISM bands. Subcarrier technology is used which provides inherent redundancy to interference because of the fact that the subcarrier appears on both sides of the 13.56 MHz powering signal. Additionally, modulation techniques such as high modulation index FSK provide enhanced redundancy because the reader is able to split-up the FSK signal in two ASK signals where each carries the data information as Mark-Space sequences, disturbing one signal leaves the other unaffected. (The FSK shift commonly is in the order of 50-100 kHz, while potential discrete Noise signals from shortwave radio signals commonly occupy a 5-10 kHz width.

Amateur Service

RFID → Amateur service

Typical installations of RFID systems are in industrial and business locations where co-location to Amateur stations would not be assumed.

Amateur service → RFID

See comments under Fixed Services. Although RFID systems might use data return frequencies which are placed near amateur band frequencies, the amateur signal would not be expected to cause harmful interference because RFID systems operate with redundancy due to the subcarrier and redundant modulation techniques or operation. Further, the RFID systems operate over a short distance of typically below 1 meter and are not likely to be influenced by E-fields from an amateur station.

Maritime

Maritime mobile communications is ship to shore and vice versa for communications beyond the range of VHF circuits. Antennas for coast stations have directivity to point off-shore so interference will be suppressed and not likely. Co-location of such equipment with RFID readers is also not likely.

Aeronautical

Long range, primarily international, communications use HF when communicating off-shore beyond the coverage of extended range VHF systems. HF aeronautical ground stations, however, are limited in number and not in very close proximity to commercial air terminals where one could expect to find RFID systems. Additionally, the type and position of the ground antennas are such that terrestrial noise versus the received signals is suppressed. Airborne operated equipment because of its distance from RFID systems will not be affected.

Radio Astronomy

Only a few worldwide receiving stations exist for regular use of the 13.36 - 13.41 MHz band as contrasted with UHF and above sites. Of these, the most important appears to be in Nancay Provence, France. While an internet search revealed that the University of Florida makes use of HF and lower VHF receiving capabilities, these are reported to be in the vicinity of 18 MHz and up. Apart from radio observation of solar activity, the

major worldwide activity for HF radio astronomy focuses on the study of emissions from the planet Jupiter. The prime spectrum for such observations is between 18-22 MHz. These signals are reported to be relatively strong (i.e. they can be heard with simple dipole antennas). Radio observatory sites are remotely located and have efficient high gain antennas beaming some 75 to 80 degrees up which should have a considerable attenuation to the side thereby reducing further the likely effect of HF RFID signals.

It should also be noted that the 13.36-13.41 MHz band is already shared with Fixed services and adjacent to an aeronautical mobile allocation. Apart from Nancay, it appears that radio astronomy installations concentrate their observations outside the 13.36-13.41 MHz band. This calls into focus the practical situation with regard to harmful interference to radio astronomy. If sharing with aeronautical, broadcast and fixed services exists on a worldwide level, the interference from the 37 uWatt erp RFID systems would appear to be tolerable.

CB Radio

These operations are not likely to be affected because the frequency is two times higher and filtering in RFID equipment can be used to maintain signals under the spurious level.

Other RFID Systems

Cross talk or interference between adjacent systems should be considered with regard to two questions:

- Does a transponder of one system "talk" into another system?
- Does an adjacent reader impair the operation of an adjacent system?

The answer to the first is that installations of such inductive systems are designed to cover only the intended reading volume of an installation. Consequently, adjacent readers will not capture signals of transponders in adjacent systems.

RFID reader-to-RFID reader interference cannot be fully excluded, but "site engineering" techniques such as shielding, power reduction, software and time multiplexing are commonly used to eliminate potential residual problems. The question of an adjacent reader interfering into another transponder that is in session with its reader is highly unlikely. This is because each reader works in session with "its own" transponders and uses the transponders' individual addresses to enable directed communications.

CONCLUSION

RFID systems operating in accordance with the limits set forth in the attached petition for rule making are not expected to cause interference to licensed radio services.