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August 8, 2002

FILED VIA ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: Notification of *Ex Parte* Presentation in FCC Docket Nos.:
ET Docket No. 00-258,
ET Docket No. 95-18,
IB Docket No. 99-81,
WT Docket No. 02-55,
RM-9498, and
RM-10024

Dear Ms. Dortch:

This letter is being filed to notify the Commission of an *ex parte* presentation in the above-referenced dockets. On August 8, 2002, Michael Stima of UTAM, Inc.; Howie Frisch of UTStarcom, Inc.; Eric DeSilva of Wiley Rein & Fielding LLP, representing UTAM, Inc.; and Daniel Adams of Kelley, Drye & Warren, representing UTStarcom, Inc., met with Julius Knapp, Deputy Chief, Office of Engineering & Technology; Alan Scrime, Chief, Policy & Rules Division, OET; Ira Keltz, Deputy Chief, Policy & Rules Division, OET; Geraldine Matise, Deputy Chief, Policy & Rules Division, OET; Anh T. Wride, Policy & Rules Division, OET; and Thomas Derenge, Chief, Spectrum Policy Branch, OET to discuss a consensus plan for revisions to Part 15, Subpart D of the Commission's rules. The parties also discussed the status of microwave clearing efforts in the UPCS band and reiterated arguments in their comments in the above-referenced proceedings against reallocation of the UPCS band. Copies of materials left with the FCC staff have been attached hereto.

In accordance with the FCC's rules, copies of this letter and the attachments are being filed in the referenced docketed proceedings and being sent, via email, to the FCC staff in attendance.

Should any questions arise concerning this notification, please do not hesitate to contact Eric DeSilva at 202.719.3182.

Sincerely,

/s/ Eric W. DeSilva

Eric W. DeSilva

Encl: Consensus Part 15 Rule Changes
UTAM Band Clearing Update

cc: Julius Knapp, Deputy Chief, Office of Engineering & Technology
Alan Scrime, Chief, Policy & Rules Division, OET
Ira Keltz, Deputy Chief, Policy & Rules Division, OET
Geraldine Matise, Deputy Chief, Policy & Rules Division, OET
Anh T. Wride, Policy & Rules Division, OET
Thomas Derenge, Chief, Spectrum Policy Branch, OET
Michael Stima, UTAM, Inc.
Howie Frisch, UTStarcom, Inc.
Daniel Adams, Kelley Drye & Warren, counsel to UTStarcom, Inc.

WRFMAIN 1157472.1

REVISED AND RESTATED PART 15, SUBPART D

Subpart D -- Unlicensed Personal Communications Services Devices

§ 15.301 Scope.– This subpart sets out the regulations for unlicensed personal communications services (PCS) devices operating in the 1910-1930 MHz and 2390-2400 MHz frequency bands.

§ 15.303 Definitions.

(a) *Asynchronous devices*. Devices that transmit RF energy at irregular time intervals, as typified by local area network data systems.

(b) *Available Band*. A band (1910-1920 MHz or 1920-1930 MHz) is available to a coordinatable UPCS device in a particular location if that location has been coordinated by UTAM, Inc. for that band, and if the device is designed to use that band.

(c) *Cooperating Devices*: A group of two or more devices among which there is RF communication that is coordinated either by a central control entity or by a distributed protocol. An example of a group of cooperating devices is a base station or access point and the portable units communicating with it.

(d) *Control Channel*: A channel that broadcasts system information and carries control information necessary for call connection (including paging information).

(e) *Controlling Device*: A component of a system that selects transmission channels and sends instructions on frequency and time election to a controlled device over a control channel. An example of a Controlling Device is a fixed base station that provides instructions to a portable unit.

(f) *Controlled Device*: A component of a system that transmits based on instructions received from a Controlling Device over a Control Channel. An example of a Controlled Device is a portable unit that takes instructions from fixed infrastructure.

(g) ~~(b)~~ *Coordinatable PCS device*. PCS devices whose geographical area of operation is sufficiently controlled either by necessity of operation with a fixed infrastructure or by disabling mechanisms to allow adequate coordination of their locations relative to incumbent fixed microwave facilities.

(h) ~~(c)~~ *Emission bandwidth.* For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

(i) ~~(d)~~ *Isochronous devices*. Devices that transmit at a regular interval, typified by time~~-~~ division voice systems.

(j) ~~(e)~~ *Noncoordinatable PCS device*. A PCS device that is capable of randomly roaming and operating in geographic areas containing incumbent microwave facilities such that operation of the PCS device will potentially cause harmful interference to the incumbent microwave facilities.

(k) ~~(f)~~ *Peak transmit power*. The ~~peak~~maximum transmit power ~~output as measured~~averaged over ~~an~~a time interval of ~~time equal to~~at most 30/B (where B is the ~~frame rate~~emission bandwidth of the signal), or the transmission burst ~~of the device~~duration, whichever is less, under all conditions of modulation. Usually this parameter is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used.

(l) ~~(g)~~ *Personal Communications Services (PCS) Devices [Unlicensed]*. Intentional radiators operating in the frequency bands 1910-1930 MHz and 2390-2400 MHz that provide a wide array of mobile and ancillary fixed communication services to individuals and businesses.

(m) ~~(h)~~ *Spectrum window*. An amount of spectrum equal to the intended emission bandwidth in which operation is desired.

(n) ~~(i)~~ *Sub-band*. For purposes of this subpart the term sub-band refers to the spectrum allocated for isochronous or asynchronous transmission.

(o) ~~(j)~~ *Thermal noise power*. The noise power in watts defined by the formula N=kTB where N is the noise power in watts, ~~k~~K is Boltzmann~~'~~'s constant, T is the absolute temperature in degrees Kelvin (e.g., 295° K) and B is the emission bandwidth of the device in hertz.

(p) ~~(k)~~ *Time window*. An interval of time in which transmission is desired.

§ 15.305 Equipment authorization requirement.~~–~~ PCS devices operating under this subpart shall be certificated by the Commission under the procedures in Subpart J of Part 2 of this Chapter before marketing. The application for certification must contain sufficient information to demonstrate compliance with the requirements of this subpart.

§ 15.307 Coordination with fixed microwave service.

(a) UTAM, Inc. is designated to coordinate and manage the transition of the 1910-1930 MHz band from the Private Operational~~-~~ Fixed Microwave Service (OFS) operating under Part 101 of this chapter to unlicensed PCS operations.

(b) Each application for certification of equipment operating under the provisions of this Subpart must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations

attendant to participation in UTAM, Inc., the Commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.

(c) An application for certification of a PCS device that is deemed by UTAM, Inc. to be noncoordinatable will not be accepted until the Commission announces that a need for coordination no longer exists.

(d) A coordinatable PCS device is required to incorporate means that ensure that it cannot be activated until its location has been coordinated by UTAM, Inc. The application for certification shall contain an explanation of all measures taken to prevent unauthorized operation. This explanation shall include all procedural safeguards, such as the mandatory use of licensed technicians to install the equipment, and a complete description of all technical features controlling activation of the device.

(e) A coordinatable PCS device that is able to operate without a fixed infrastructure shall incorporate an automatic mechanism for disabling operation in the event it is moved outside the geographic area where its operation has been coordinated by UTAM, Inc. The application for certification shall contain a full description of the safeguards against unauthorized relocation and must satisfy the Commission that the safeguards cannot be easily defeated.

(f) At such time as the Commission deems that the need for coordination between unlicensed PCS operations and existing Part 101 Private Operational- Fixed Microwave Services ceases to exist, the disabling mechanism required by paragraph (e) of this section will no longer be required.

(g) Operations under the provisions of this subpart are required to protect systems in the Private Operational-Fixed Microwave Service operating within the 1850-1990 MHz band until the dates and conditions specified in §§ 101.69 through 101.73 of this chapter for termination of primary status. Interference protection is not required for Part 101 stations in this band licensed on a secondary basis.

(h) The operator of a PCS device that is relocated from the coordinated area specified by UTAM, Inc., must cease operating the device until coordination for the new location is verified by UTAM, Inc.

§ 15.309 Cross reference.

(a) The provisions of Subpart A of this Part apply to unlicensed PCS devices, except where specific provisions are contained in Subpart D.

(b) The requirements of Subpart D apply only to the radio transmitter contained in the PCS device. Other aspects of the operation of a PCS device may be subject to requirements contained elsewhere in this Chapter. In particular, a PCS device that includes digital circuitry

not directly associated with the radio transmitter also is subject to the requirements for unintentional radiators in Subpart B.

§ 15.311 Labelling requirements. – In addition to the labelling requirements of § 15.19(a)(3), all devices operating in the frequency band 1910 – 1930 MHz authorized under this subpart must bear a prominently located label with the following statement:

> Installation of this equipment is subject to notification and coordination with UTAM, Inc. Any relocation of this equipment must be coordinated through, and approved by UTAM. UTAM may be contacted at [insert UTAM's toll-free number].

§ 15.313 Measurement procedures. – Measurements must be made in accordance with Subpart A, except where specific procedures are specified in Subpart D. If no guidance is provided, the measurement procedure must be in accordance with good engineering practice.

§ 15.315 Conducted limits. – An unlicensed PCS device that is designed to be connected to the public utility (AC) power line must meet the limits specified in § 15.207.

§ 15.317 Antenna requirement. – An unlicensed PCS device must meet the antenna requirement of § 15.203.

§ 15.319 General technical requirements.

(a) The 1910-1920 MHz band is limited to use by asynchronous devices under the requirements of § 15.321 and ~~2390-2400 MHz bands are limited to use~~ by ~~asynchronous~~ isochronous devices under the requirements of §~~15.321.~~ 15.320. The 1920-1930 MHz ~~sub-band~~subband is limited to use by isochronous devices under the requirements of § 15.323. The 2390-2400 MHz band is limited to use by asynchronous devices under the requirements of § 15.321.

(b) All transmissions must use only digital modulation techniques.

(c) Peak transmit power.

(1) For devices operating in the 1910-1920 MHz band, peak transmit power for controlled devices shall not exceed 180 microwatts multiplied by the square root of the emission bandwidth in hertz. When a coordinatable PCS device is operating in a county with population not less than 500 per square mile, peak transmit power for controlling devices shall not exceed 250 microwatts multiplied by the square root of the emission bandwidth in hertz. When a coordinatable PCS device is operating in a county with population less than 500 per square mile, peak transmit power for controlling devices shall not exceed 3600 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when

compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(2) For devices operating in the 1920-1930 MHz band, peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(d) Power Spectral Density.

(1) For devices operating in the 1910-1920 MHz band in a county with population greater than 500 per square mile, power spectral density shall not exceed 3 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

(2) For devices operating in the 1910-1920 MHz band in a county with population less than 500 per square mile, power spectral density shall not exceed 9.5 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

(3) ~~(d) Power~~For devices operating in the 1920-1930 MHz band, power spectral density shall not exceed 3 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

(e) The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds ~~3~~6 dBi.

(f) The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. ~~These~~The provisions in this section are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

(g) Notwithstanding other technical requirements specified in this subpart, attenuation of emissions below the general emission limits in § 15.209 is not required.

(h) Where there is a transition between limits, the tighter limit shall apply at the transition point.

(i) Unlicensed PCS devices are subject to the radiofrequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "“general population/uncontrolled"” environment. Applications for equipment authorization of devices operating under this section must contain a

statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

§ 15.320 Specific requirements for associated controlling and controlled isochronous devices operating in the 1910-1920 MHz bands.

(a) Operation shall be contained within the 1910-1920 MHz band for devices that comply with §15.323 (c) through (f) and within the 1910–1918.1 MHz band for other devices. The emission bandwidth of any intentional radiator operating in these bands shall be no more than 1.25 MHz.

(b) All systems shall have their single control channel in the 1910-1912.5 MHz band. It shall be possible to change the control channel used within this band.

(c) The isochronous controlling devices must incorporate a mechanism for monitoring the time and spectrum windows that its transmission is intended to occupy. The following criteria must be met by controlling and controlled devices:

(1) Not more than 2 s prior to initiating transmission, devices must monitor the combined time and spectrum windows in which they intend to transmit for a period of at least 10 milliseconds for systems designed to use a 10 milliseconds or shorter frame period or at least 20 milliseconds for systems designed to use a 20 milliseconds frame period.

(2) The monitoring threshold must not be more than 39 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device.

(3) If no signal above the threshold level is detected, transmission may commence and continue with the same emission bandwidth in the monitored time and spectrum windows without further monitoring. However, occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria. The 8 hour limitation does not apply to any of the control channels in the 1910-1912.5 MHz band.

(4) If access to spectrum is not available as determined by the above, and a minimum of 40 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level below a monitoring threshold of 57 dB above the thermal noise power determined for the emission bandwidth may be accessed. A device utilizing the provisions of this paragraph must have monitored all access channels defined for its system within the last 10 seconds and must verify, within the 20 milliseconds (40 milliseconds for devices designed to use a 20 milliseconds frame period) immediately preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the previously detected value. The power measurement resolution for this comparison must be accurate to within 6 dB. No device or group of cooperating devices located within 1 meter of each other shall occupy more than three 1.25 MHz channels during any frame period.

(5) If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same windows after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available.

(6) The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission and have a maximum reaction time less than 50xSQRT (1.25/ emission bandwidth in MHz) microseconds for signals at the applicable threshold level but shall not be required to be less than 50 microseconds. If a signal is detected that is 6 dB or more above the applicable threshold level, the maximum reaction time shall be 35xSQRT (1.25/emission bandwidth in MHz) microseconds but shall not be required to be less than 35 microseconds.

(7) The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

(8) Devices that have a power output lower than the maximum permitted under this subpart may increase their monitoring detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

(9) An initiating controlling device may attempt to establish a duplex connection by monitoring both its intended transmit and receive time and spectrum windows. If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window. If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting on the receive time and spectrum window monitored by the initiating device. An initiating controlled device must first communicate over the control channel to a controlling device its desire to establish a duplex connection and wait for instructions from the controlling device.

(10) An initiating device that is prevented from monitoring during its intended transmit window due to monitoring system blocking from the transmissions of a colocated (within one meter) transmitter of the same system, may monitor the portions of the time and spectrum windows in which they intend to receive over a period of at least 10 milliseconds. The monitored time and spectrum window must total at least 50 percent of the 10 millisecond frame interval and the monitored spectrum must be within the 1.25 MHz frequency channel(s) already occupied by that device or colocated cooperating devices. If the access criteria is met for the intended receive time and spectrum window under the above conditions, then transmission in the intended transmit window by the initiating device may commence.

(11) The provisions of (c)(10) or (c)(11) of this section shall not be used to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum to other devices.

(d) Emissions shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the channel edges and 1.25 MHz above or below the channel; 50 dB between 1.25 and 2.5 MHz above or below the channel; and 60 dB at 2.5 MHz or greater above or below the channel. Systems that further subdivide a 1.25 MHz channel into X subchannels must comply with the following emission mask: In the bands between 1B and 2B measured from the center of the emission bandwidth the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the 1.25 MHz channel edge the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60dB below the transmit power permitted for that radiator. ''B'' is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

(e) The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of an intentional radiator operating in these subbands shall be 20 milliseconds or 10 milliseconds/X where X is a positive whole number. Each device that implements time division for the purposes of maintaining a duplex connection on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 50 parts per million (ppm). Each device which further divides access in time in order to support multiple communication links on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 10 ppm. The jitter (timerelated, abrupt, spurious variations in the duration of the frame interval) introduced at the two ends of such a communication link shall not exceed 25 microseconds for any two consecutive transmissions. Transmissions shall be continuous in every time and spectrum window during the frame period defined for the device.

(f) The frequency stability of the carrier frequency of the intentional radiator shall be maintained within ±10 ppm over 1 hour or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of -20° to +50 °C at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 °C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage.

§ 15.321 Specific requirements for asynchronous devices operating in the 1910-1920 MHz and 2390-2400 MHz bands.

(a) Operation shall be contained within either or both of the 1910-1920 MHz and 2390-2400 MHz bands. The emission bandwidth of any intentional radiator operating in these bands shall be no less than 500 kHz.

(b) All systems of less than 2.5 MHz emission bandwidth shall start searching for an available spectrum window within 3 MHz of the band edge at 1910, 1920, 2390, or 2400 MHz while systems of more than 2.5 MHz emission bandwidth will first occupy the center half of the band. Devices with an emission bandwidth of less than 1.0 MHz may not occupy the center half of the band if other spectrum is available.

(c) ~~Asynchronous~~ Unless authorized under Section (h) of this paragraph, asynchronous devices must incorporate a mechanism for monitoring the spectrum that its transmission is intended to occupy. The following criteria must be met:

(1) At least once per 24 hour period, the device must monitor the 1910-1912.5 MHz band with a threshold of not more than –81 dBm.

(2) ~~(1) Immediately~~ If activity is detected in the 1910-1912.5 MHz band, then, immediately prior to initiating a transmission, devices must monitor the spectrum window they intend to use for at least 50 microseconds for spectrum windows in the 2390-2400 MHz band, for at least 5 ms for spectrum windows in the 1912.5 – 1920 MHz band and for at least 100 ms for spectrum windows in the 1910 – 1912.5 MHz band. If no activity is detected in the 1910-1912.5 MHz band, then, immediately prior to initiating a transmission, devices must monitor the spectrum window they intend to use for at least 50 microseconds for all spectrum windows.

(3) ~~(2)~~ The monitoring threshold must not be more than 32 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth of the device.

(4) ~~(3)~~ If no signal above the threshold level is detected, a transmission burst may commence in the monitored spectrum window. Once a transmission burst has started, an individual device or a group of cooperating devices is not required to monitor the spectrum window provided the intraburst gap timing requirement specified below is not exceeded.

(5) ~~(4)~~ After completion of a transmission, an individual device or cooperating group of devices must cease transmission and wait a deference time randomly chosen from a uniform random distribution ranging from 50 to 750 microseconds, after which time an attempt to access the band again may be initiated. For each occasion that an access attempt fails after the initial inter-burst interval, the range of the deference time chosen shall double until an upper limit of 12 milliseconds is reached. The deference time remains at the upper limit of 12 milliseconds until an access attempt is successful. The deference time is re-initialized after each successful access attempt.

(6) ~~(5)~~ The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission and shall have a maximum reaction time less than 50xSQRT (1.25/emission bandwidth in MHz) microseconds for signals at the applicable threshold level but shall not be required to be less than 50 microseconds. If a signal is detected that is 6 dB or more above the threshold level, the maximum reaction time shall be 35xSQRT(1.25/emission bandwidth in MHz) microseconds but shall not be required to be less than 35 microseconds.

(7) ~~(6)~~ The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

(8) ~~(7)~~ Devices that have a power output lower than the maximum permitted under the rules may increase their detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

(d) Emissions shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the sub-band edges and 1.25 MHz above or below the sub-band; 50 dB between 1.25 and 2.5 MHz above or below the sub-band; and 60 dB at 2.5 MHz or greater above or below the sub-band. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

(e) The ~~frequency stability of the carrier frequency of intentional radiators operating in accordance with this section shall be +/- 10 ppm over 10 milliseconds or the interval between channel access monitoring, whichever is shorter. The frequency stability~~emission limits of §15.321(d) shall be maintained over a temperature variation of -20° to +50° Celsius at normal supply voltage, and over a variation in ~~the~~ primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 degrees Celsius. For devices operating under the provisions of (c) above, the monitoring system bandwidth must allow for the effects of temperature and supply voltage variations on the emissions. For equipment that is capable of operating only from a battery, the ~~frequency stability~~emission limit and monitoring bandwidth tests shall be performed using a new battery without any further requirement to vary supply voltage.

(f) An asynchronous transmission burst is a series of transmissions from one or more transmitters acting cooperatively. The transmission burst duration from one device or group of devices acting cooperatively shall be no greater than 10 milliseconds. Any intraburst gap between cooperating devices shall not exceed 25 microseconds.

(g) Operation of devices in the 2390-2400 MHz band from aircraft while airborne is prohibited, in order to protect space research operations at the National Astronomy and Ionospheric Center at Arecibo, Puerto Rico.

(h) As an alternative to Section (c) of this paragraph, devices operating in the 1912.5-1920 MHz band may instead limit their duty cycle such that: (1) the transmit duty cycle of any individual device over any 1-second interval does not exceed 25 percent, unless that device is a member of a group of cooperating devices; and (2) the aggregate transmit duty cycle of any group of cooperating devices over any 1-second interval does not exceed 50 percent.

§ 15.323 Specific requirements for isochronous devices operating in the 1920-1930 MHz sub-band.

(a) Operation shall be contained within one of eight 1.25 MHz channels starting with 1920-1921.25 MHz and ending with 1928.75-1930 MHz. Further sub-division of a 1.25 MHz channel is permitted with a reduced power level, as specified in § 15.319(c), but in no event shall the emission bandwidth be less than 50 kHz.

(b) Intentional radiators with an intended emission bandwidth less than 625 kHz shall start searching for an available time and spectrum window within ~~3~~5 MHz of the ~~sub-band~~ lower edge ~~at 1920 MHz~~ of the lowest available band and search upward from that point. Devices with an intended emission bandwidth greater than 625 kHz shall start searching for an available time and spectrum window within ~~3~~5 MHz of the ~~sub-band~~ upper edge ~~at 1930 MHz~~ of the highest available band and search downward from that point.

(c) Isochronous devices must incorporate a mechanism for monitoring the time and spectrum windows that its transmission is intended to occupy. The following criteria must be met:

(1) Immediately prior to initiating transmission, devices must monitor the combined time and spectrum windows in which they intend to transmit for a period of at least 10 milliseconds for systems designed to use a 10 millisecond or shorter frame period or at least 20 milliseconds for systems designed to use a 20 millisecond frame period.

(2) The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device.

(3) If no signal above the threshold level is detected, transmission may commence and continue with the same emission bandwidth in the monitored time and spectrum windows without further monitoring. However, occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

(4) Once access to specific combined time and spectrum windows is obtained an acknowledgement from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgements must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signalling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which time the access criteria must be repeated.

(5) If access to spectrum is not available as determined by the above, and a minimum of 40 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level below a monitoring threshold of 50 dB above the thermal noise power determined for the emission bandwidth may be accessed. A device utilizing the provisions of this paragraph must have monitored all access channels defined for its system within the last 10 seconds and must verify, within the 20 milliseconds (40 milliseconds for devices designed to use a 20 millisecond frame period) immediately preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the

previously detected value. The power measurement resolution for this comparison must be accurate to within 6 dB. No device or group of cooperating devices located within 1 meter of each other shall occupy more than ~~three~~six 1.25 MHz channels during any frame period. Devices in an operational state that are utilizing the provision of this section are not required to use the search provisions of paragraph (b) of this section.

(6) If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same windows after waiting ~~an~~ amount of time~~,~~ that exceeds 150 milliseconds, or is randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available.

(7) The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission and have a maximum reaction time less than 50xSQRT (1.25/ emission bandwidth in MHz) microseconds for signals at the applicable threshold level but shall not be required to be less than 50 microseconds. If a signal is detected that is 6 dB or more above the applicable threshold level, the maximum reaction time shall be 35xSQRT (1.25/emission bandwidth in MHz) microseconds but shall not be required to be less than 35 microseconds.

(8) The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

(9) Devices that have a power output lower than the maximum permitted under ~~the rules~~this subpart may increase their monitoring detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

(10) An initiating device may attempt to establish a duplex connection by monitoring both its intended transmit and receive time and spectrum windows. If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window. If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting on the receive time and spectrum window monitored by the initiating device.

(11) An initiating device that is prevented from monitoring during its intended transmit window due to monitoring system blocking from the transmissions of a co-located (within one meter) transmitter of the same system, may monitor the portions of the time and spectrum windows in which they intend to receive over a period of at least 10 milliseconds. The monitored time and spectrum window must total at least 50 percent of the 10 millisecond frame interval and the monitored spectrum must be within the 1.25 MHz frequency channel(s) already occupied by that device or co-located co-operating devices. If the access criteria is met for the intended receive time and spectrum window under the above conditions, then transmission in the intended transmit window by the initiating device may commence.

(12) The provisions of (c)(10) or (c)(11) of this section shall not be used to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum to other devices.

(d) Emissions shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the channel edges and 1.25 MHz above or below the channel; 50 dB between 1.25 and 2.5 MHz above or below the channel; and 60 dB at 2.5 MHz or greater above or below the channel. Systems that further sub-divide a 1.25 MHz channel into X sub-channels must comply with the following emission mask: In the bands between 1B and 2B measured from the center of the emission bandwidth the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the 1.25 MHz channel edge the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator. "‘‘B"’’ is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

(e) The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of an intentional radiator operating in these sub-bands shall be 20 milliseconds or 10 milliseconds/X where X is a positive whole number. Each device that implements time division for the purposes of maintaining a duplex connection on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 50 parts per ~~millions~~ million (ppm). Each device which further divides access in time in order to support multiple communication links on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 10 ppm. The jitter (time-related, abrupt, spurious variations in the duration of the frame interval) introduced at the two ends of such a communication link shall not exceed 25 microseconds for any two consecutive transmissions. Transmissions shall be continuous in every time and spectrum window during the frame period defined for the device.

(f) The frequency stability of the carrier frequency of the intentional radiator shall be maintained within +/- 10 ppm over 1 hour or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of -20° to +50 ° degrees C at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 ° C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage.

UTAM, Inc.

MAY 2002

COUNTY CLEARING STATUS

	ASYNCHRONOUS (1910 - 1920 MHz)		ISOCHRONOUS (1920 - 1930 MHz)	
	# OF COUNTIES CLASSIFIED	% OF COUNTIES CLASSIFIED	# OF COUNTIES CLASSIFIED	% OF COUNTIES CLASSIFIED
ZONE 1	1,627	52%	1,915	61%
ZONE 2	294	9%	71	2%
NON-SCHEDULED	1,220	39%	1,155	37%
TOTAL	**3,141**		**3,141**	

o PLUS ALL COUNTIES IN PUERTO RICO HAVE BEEN CONVERTED TO "NON-SCHEDULED".

TOTAL NUMBER OF LINKS REMAINING TO COMPLETELY CLEAR THE ISOCH BAND **90**

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ISOCH BAND	*7*
ASYNCH BAND	*4*
ADJACENT CHANNEL	*79*

ADDITIONAL LINKS REMAINING TO COMPLETELY CLEAR THE ASYNCH BAND **27**