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February 4, 1994

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Mr. William F. Caton, Acting Secretary
Federal Communications Commission
Washington, D.C. 20554

In re: Ex Parte Presentation
Docket No. 90-314
The Ericsson Corporation

Dear Mr. Caton:

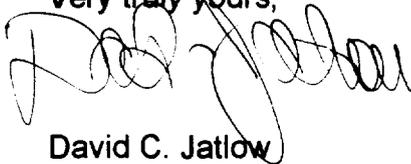
Pursuant to the provisions of Section 1.1206 of the Commission's rules, this letter will serve to advise you that on this date representatives of The Ericsson Corporation met with staff members of the Office of Engineering and Technology to discuss matters related to unlicensed PCS issues.

Attached hereto is an original and one copy of the presentation made, including a summary and other materials submitted to the staff during this meeting.

In addition, copies of this letter and associated materials are being hand delivered on this date to Dr. Tom Stanley, Julius Knapp, David Means and Phil Inglis.

Should there be any questions with regard to this matter, kindly communicate directly with the undersigned.

Very truly yours,



David C. Jatlow
Counsel for The Ericsson Corporation

The Ericsson Corporation

February 4, 1994

Discussion of outstanding issues relating to
the Part 15 Subpart D rules.

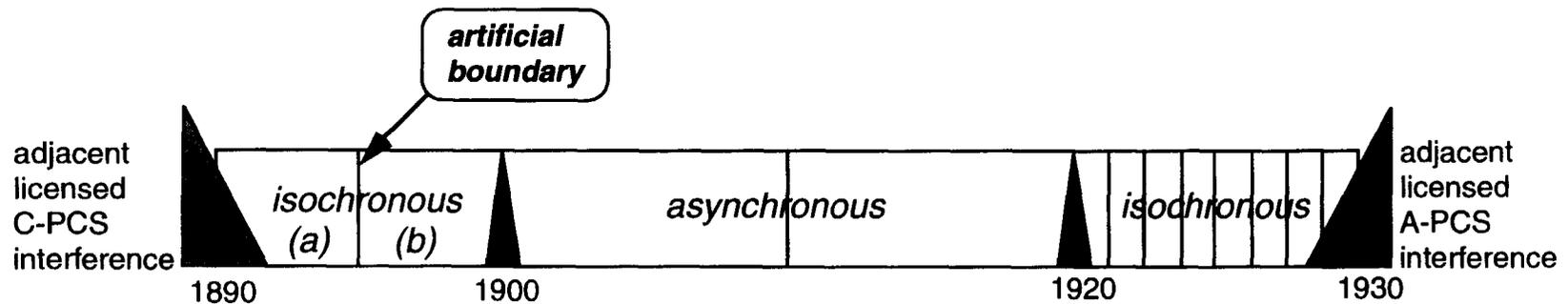
Introduction

Key discussion topics...

- Removal of band segmentation in the lower isochronous sub-band.
- Removal of band segmentation in the upper isochronous sub-band.
- Removal of band segmentation in the upper isochronous sub-band is essential to the rapid deployment of systems.
- Equitable regulatory treatment will accelerate funding for band clearing.
- Additional issues... summarized in attached 2-sheet table.

Band Segmentation

Remove the artificial boundary that creates the two 5 MHz "channels" in the 1890 - 1900 isochronous band.

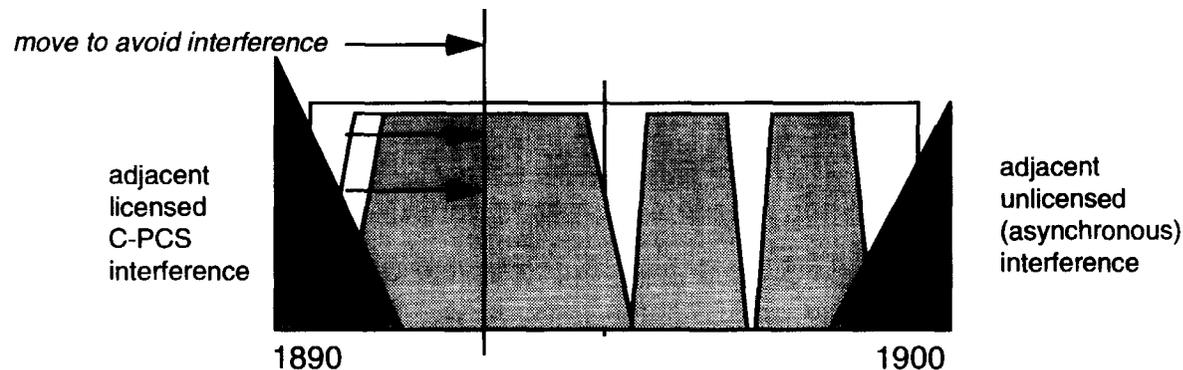


- One 10 MHz wide channel should be created in combination with...
- A maximum transmission bandwidth limitation to prevent any single device from *dominating* the entire band.

Removal of the artificial boundary

Why should this be done?

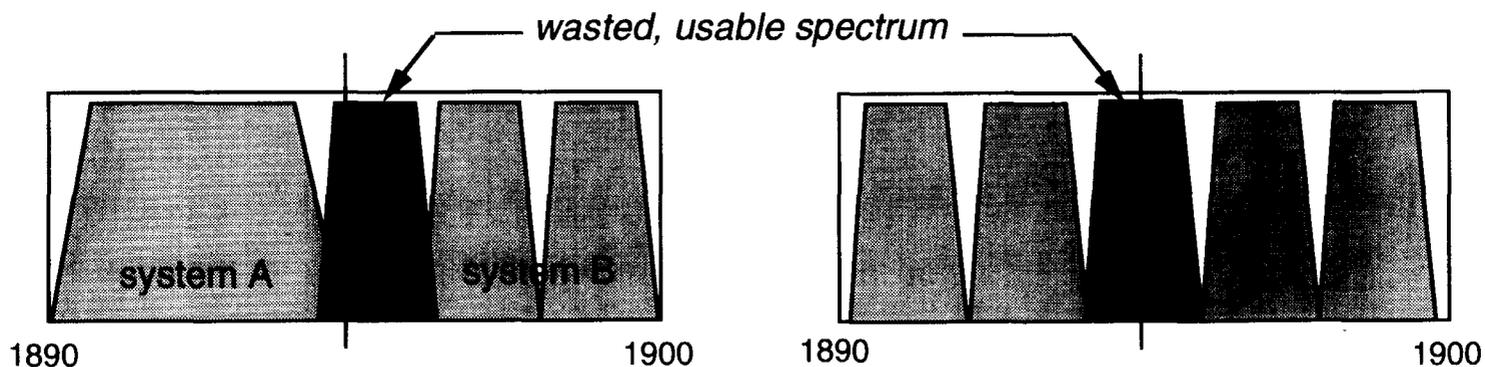
- It is a unanimous opinion among wideband equipment manufacturers intending to use this part of the spectrum.
- It will create wasted spectrum unless equipment bandwidths and carrier spacings are specifically optimized around the artificial boundary.
- It restricts flexibility to avoid band-edge interference from existing u-wave links, licensed PCS and unlicensed asynchronous PCS devices.



Removal of the artificial boundary

Why should this be done? (continued)

- The rules already allow a single device to transmit in both 5 MHz segments, yet that same device may not transmit at the artificial boundary!
- This serves no beneficial technical purpose.
- This wastes and blocks access to usable spectrum.
- This prevents effective placement of carriers in the 10 MHz band.



The consequence of removing the artificial boundary

The following rules are affected and must be modified:

- 15.321(a) should define one 10 MHz channel from 1890 to 1900 MHz with a *maximum* allowable transmission bandwidth value ≤ 5 MHz.
- 15.321(c)(5) last sentence should be replaced with the following: "No device or group of fixed cooperating devices located within 1-meter of each other shall occupy a total (sum) of more than 50%¹ of the 10 MHz lower isochronous sub-band during a 10 ms frame."²
- There is no impact or threat of a single device dominating the entire band.

1. For devices operating in both isochronous bands, the maximum occupancy should be 35% of the total 20 MHz. (This is required to be in alignment with the last sentence of FCC rule 15.321(c)(5) which serves to avoid a single system from dominating the entire band.)

2. Paragraph 2.10 of the Technical Appendix of the *Opposition to the Petitions for Reconsideration* filed by the Ericsson Corporation in GEN Docket No. 90-314, December 30, 1993.

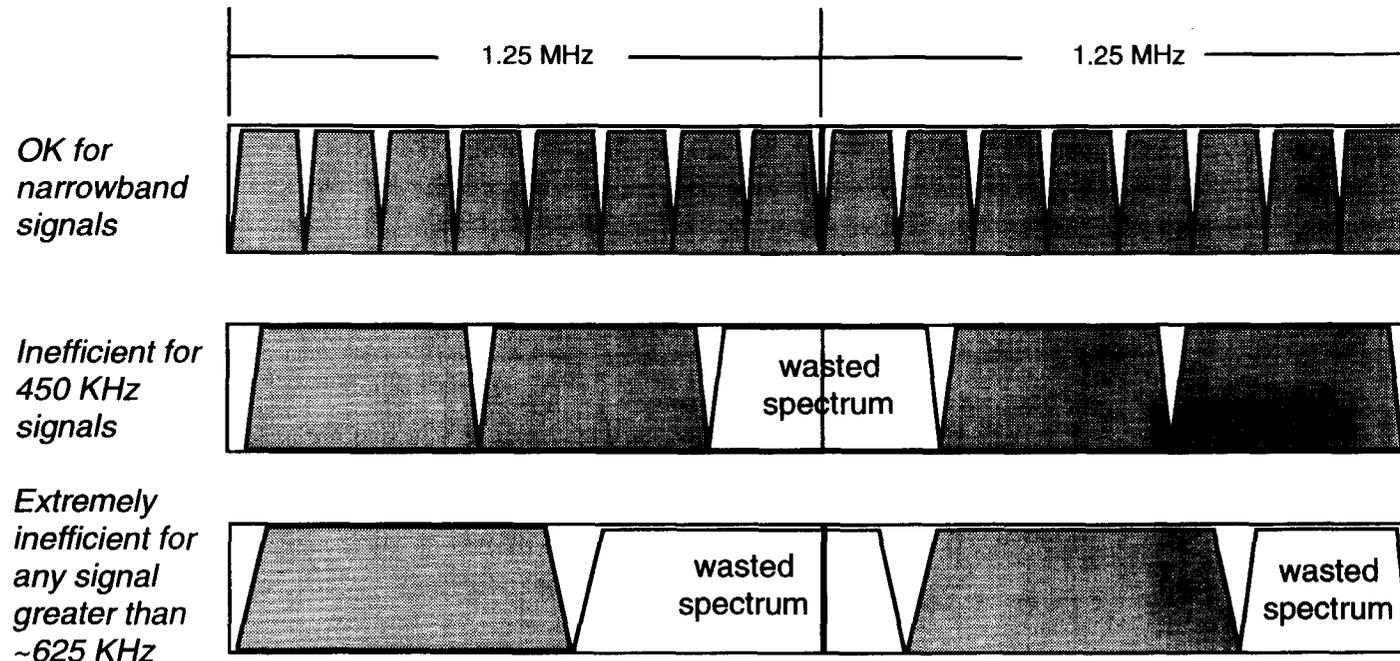
Segmentation in the 1920 - 1930 MHz isochronous band

The present rules provide 8 x 1.25 MHz segments...

- This segmentation does not provide any guarantee of effective "packing" except for a manufacturer that chooses to design a technology with transmission bandwidths and carrier spacings that *specifically* fit the 1.25 MHz ordering.
- For very narrowband transmissions, (~100 KHZ) the segmentation has no impact.
- For bandwidths >400 KHz, 25 to 50% of the available spectrum could be unusable (wasted) because the segment borders prevent effective packing of the carriers.

Segmentation in the 1920 - 1930 MHz isochronous band

Wasted and inefficient use of spectrum is certain!



Segmentation

Remove It!

- It does NOTHING to assist in the channel location process.³
- There is consensus among the wideband manufacturers on this issue.
- It is unfair to wideband systems because it ALWAYS limits their access to only 50% of the total 20 MHz isochronous allocation.
- **Narrowband devices are allowed full access to BOTH isochronous bands.**
- **Any difference in the rules for the upper and lower bands creates an unfair situation and discourages technology investment.**

3. Paragraph III.B, page 10 of the *Reply to Oppositions to Petitions for Reconsideration* filed by the Ericsson Corporation in GEN Docket No. 90-314, January 13, 1994

Segmentation and Band Clearing

Existing unlicensed rules create disincentives to rapid band clearing...

- Significantly fewer links exist in the upper isochronous band than in the lower band.
- It is probable that the upper band will be cleared of u-wave links much sooner.
- Narrowband technologies will bear the burden of cost associated with the clearing this band.
- Fairness dictates that in the early deployment period, all types of devices should have equal opportunity. Relocation revenues will be generated quicker.
- If wideband devices are restricted to only utilizing the lower 10 MHz band, there will be an extended delay in deployment.
- The only source of immediate funding for band clearing is existing technologies.

Remove segmentation from the upper isochronous band

The present rules define a combination of segmentation and sub-band emission levels that result in an effective bandwidth limitation of only ~900 KHz!

- Minimum solution:
 - Remove the artificial segments and simply apply the same proposed rules as the lower band... one 10 MHz channel with a specified maximum transmit bandwidth.
 - This specified maximum should be set to a reasonable value (for example, ~2 MHz) which allows most existing technologies to be implemented to provide immediate funding.

Summary

- Removal of the artificial boundary that creates two "channels" in the lower isochronous band and modification of the existing 15.321(a) & (c)(5) rules as suggested is critical and non-controversial.
- Ericsson also recommends that these same rules be applied for the entire isochronous band.
- The above modifications could easily be implemented in a contiguous 20 MHz isochronous band should the FCC decide to modify the band allocation.
- A summary and ranking of other remaining non-controversial problems with recommendations is attached.

A summary and ranking of other technical problems with the existing Part 15 Subpart D Rules.

The proposed solutions are viewed by Ericsson as being widely supported.

Ranking: 1= critical to implementation
 2= essential to a *practical* implementation
 3= rule enhancements

Rank	FCC Rule	Identification of Problem and/or Suggested Action	Ericsson Reference
1	15.321(c)(1)	Add duplex operation rule and monitor <u>both</u> the <u>intended</u> Rx + Tx windows. The present rules do not allow a reliable method of duplex-channel operation!	Reference 1, Paragraph 1, Reference 2, Paragraph 2.3
1	15.321(b)	As a minimum, the present packing rule <u>must be removed</u> because it causes unreliable operation on channel set-ups and can cause a "deadly embrace" situation. (It is good to have a rule that principally requires good judgement when selecting channels and that forbids the careless or purposeful spread of channels across the available band. For example, "The time spectrum window for a connection between two devices shall, subject to section 15.321(c), be selected as close as <u>reasonable</u> to any time/spectrum window already in use by any of the two devices.")	Reference 2, paragraph 2.10
1	15.321(c)(5)	Change to "... at least 40 access channels, <u>or less if 40 are not available, within the last 10 ms.</u> "... and change the words "in a system" to "in a <u>device</u> ." (This is necessary because some channels may be barred from use because of existing u-wave links.)	Reference 2, paragraph 2.7
1	15.321(c)(8)	The rule should only require a monitoring accuracy that insures the threshold is not <u>exceeded</u> by the specified limit of 3 dB. (It is not important if the threshold is misjudged in the opposite direction.)	Reference 1, paragraph 7 Reference 2,, paragraph 2.6
2	15.321(c)(7)	Monitoring bandwidth should be ~80% of Tx bandwidth to allow <i>practical</i> implementation of designs. (Most receiver filters are somewhat narrower than the transmission bandwidth.)	Reference 1, paragraph 6
2	NEW	Add in a section on marker transmissions to re-instate & improve the WINForum (Rev 16) marker transmission and definition in response to the general request to allow 30 seconds of unacknowledged control & signalling information.	Reference 2, paragraph 2.2
2	15.319(f)	Control & signalling information MUST be subject to compliance with 15.321 rules. (Without this small editorial correction, the present rules could be misinterpreted to allow transmissions without using listen-before-talk rules!)	Reference 1, Paragraph 11
2	15.321(c)(4)	Add a requirement for <u>regular</u> acknowledgements. (This will guarantee the "release" of access channels when communications is lost between two devices.)	Reference 1, paragraph 10

2	15.321(f)	Overly restrictive temperature range requirement adds unnecessary costs.	Reference 1, paragraph 4
2	15.321(d)	Change emission limits outside the channel edges from -40 to -30 dB. (This significantly reduces unnecessary restrictions on designs and optimized carrier positions and has little impact on interference generation.)	Reference 2, paragraph 2.4
3	15.303(f)	Correct the inconsistency in the rules about peak transmit power. (The measurement period should relate to the actual burst transmission period, not the entire frame period.)	Reference 1, paragraph 8
3	15.319(c)	A 3 to 5 dB power crest-factor is more reasonable than 10 dB. (The 10 dB value proposed in a number of petitions could cause undesirable interference problems.)	Reference 2, paragraph 2.5
3	15.321(c)(1)	Change the wording for monitoring conditions... "...devices <u>must have</u> monitored the time and spectrum windows they intend to use...." (As written, the rules could be misinterpreted to prevent channel access based on the recorded prior 10 ms history.)	Reference 1, paragraph 9
3	15.321(c)(5)	It is better to allow increasing the thermal noise power (KTB) +50 dB to KTB +65 dB than it is to allow systems to <i>generally</i> bypass this rule if they recognize their own transmissions (as proposed by some respondents). <i>See note 1.</i>	Reference 2, paragraph 2.8

NOTES

1. In the spirit of insuring fair and effective rules are implemented the following could be considered:
 - (a) For a set-up to or from a CDMA base station, there should be no need to meet the threshold requirements on selected time/spectrum windows decoded as already being in use by that base station.
 - (b) A base station should be allowed to set up on a Tx/Rx time/spectrum window pair by only meeting the threshold requirements for the intended Rx time windows, provided that transmissions on the intended Tx time windows are decoded as being from the same base station. (This allows close packing of carriers in a multicarrier base station (typically FDMA) which is very difficult without this provision.)

REFERENCES

1. Appendix 1 of the *Petition for Reconsideration and Clarification* filed by the Ericsson Corporation in GEN Docket No. 90-314, December 8, 1993.
2. Technical Appendix of the *Opposition to the Petitions for Reconsideration* filed by the Ericsson Corporation in GEN Docket No. 90-314, December 30, 1993.