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FEDERAL COMMUNICATIONS COMMISSION  
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Mr. Thomas Sugrue, Chief  
Wireless Telecommunications Bureau  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington DC 20554

In re: Ericsson Inc.  
Request for Approval to Include Digital Modes Within Call Completion Methods

Dear Mr. Sugrue:

WT Docket #99-328

This letter requests confirmation that Ericsson's call completion method for dual band, multi-mode phones which operate on cellular frequencies in the analog and digital (TDMA) modes as well as on PCS frequencies in the digital (TDMA) mode, complies with policies established in the *Second Report and Order* in the Enhanced 911 Emergency Call Systems proceeding.<sup>1</sup>

The overarching goal of the *Second Report and Order* is "...to improve the ability of analog cellular phone users to successfully complete wireless 911 calls."<sup>2</sup> To accomplish that result the Commission adopted three separate call completion methods for analog phones, i.e., Automatic A/B Roaming - Intelligent Retry, Adequate/Strongest Signal and Selective Retry. Much time and attention in the *Second Report and Order* was devoted to an analysis of each of the three call completion methods in the analog mode. Indeed, the *Second Report and Order* can be viewed as an order devoted almost exclusively to call completion methodologies for analog-only phones.

The *Second Report and Order* noted that more dual-mode, digital preferred handsets will be sold in the future than analog-only phones. Despite acknowledgement that the feasibility of including Automatic A/B Roaming in the dual-mode portion of multi-mode handsets had only recently been raised and manufacturers were in the process of investigating whether it can be applied, the Commission concluded that such handsets, when operating in the analog mode should do so in compliance with the rules adopted for analog-only phones.<sup>3</sup>

<sup>1</sup> *Second Report and Order, In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, FCC 99-96, \_\_ FCC Rcd \_\_ (released June 9, 1999) (hereinafter *Second Report and Order*).

<sup>2</sup> *Second Report and Order*, para. 1.

<sup>3</sup> See *Second Report and Order*, paras. 85-86.

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Manufacturers do not design separate analog and digital modules for multi-mode phones and simply put them together in a common handset form. Instead, the processing algorithms for multi-mode phones are designed as a single package to reduce memory requirements, increase battery life, maintain compact size and keep costs to a minimum all in an effort to provide the user with the best possible product. With regard to this request, digital scanning algorithms for multi-mode phones also ensure that a higher call completion rate occurs. Thus, in addition to the impracticality of considering a multi-mode phone as incorporating two separate modes (analog and digital), a regulatory approach which does not take full advantage of the capabilities of multi-mode phones could jeopardize the most efficient and expeditious manner of completing wireless E911 calls.

Ericsson's dual mode analog/TDMA digital phones comply with the stated goal of the *Second Report and Order*. As described more fully in the technical description of its E911 call completion methodology attached hereto, analog/digital multi-mode phones have access to two cellular bands and six PCS bands which can be scanned to complete a wireless E911 call. Thus, Ericsson's call completion methodology is likely to result in a higher percentage of completed wireless E911 calls. In this regard, while Ericsson's wireless E911 call completion methodology for dual band, multi-mode analog/TDMA handsets is slightly different than Nokia's proposed call completion methodology for dual band, multi-mode analog/CDMA handsets<sup>4</sup> (due to the difference between CDMA and TDMA technologies), both proposals serve to increase the call completion percentage for wireless E911 calls and therefore serve the public interest.<sup>5</sup>

Pursuant to paragraph 97 of the *Second Report and Order*, Ericsson requests that the Commission confirm that its wireless E911 call completion methodology for dual band, multimode analog/TDMA handsets is consistent with Section 20.921 of the Commission's rules.

Respectfully submitted,



David C. Jatlow  
Counsel for Ericsson Inc.

cc: Kris Monteith, Esq.  
Mr. Ron Netro

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<sup>4</sup> See Letter from David Siddall to Thomas Sugrue dated October 27, 1999 and WT Docket 99-328.

<sup>5</sup> Ericsson submits it is not necessary to put its call completion methodology out for public comment since the policy issues are identical to those raised in Nokia's October 27, 1999 proposal and it would facilitate an expeditious decision in light of the impending deadline for compliance with the *Second Report and Order*.

# **ERICSSON**

## **E911 Call Completion Procedures**

December 16, 1999

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## 1. Introduction

This Ericsson proposal describes an alternate process to the proposed FCC Wireless E911 Docket No. 94-102 that requires new wireless analog handsets to be able to complete 911 call to either analog carrier in an area, regardless of the programming of the handset for non-911 calls. This document proposes the use of both digital and analog transmission technologies to improve the defined requirements of the FCC Second Report and Order (R&O) addressing call completion rates, completion of the call wherever possible, while not disrupting the overall operation of the 911 service.

### 1.1. Purpose

The purpose of this document is to detail requirements for Enhanced 911 Emergency Call Completion for all Ericsson's mobiles capable of operating in a TDMA digital technology or dual mode technology in the United States.

### 1.2. References

- Reference** /1/  
**Designation** FCC  
**Name** Enhanced 911 Emergency Calling Systems  
**Source** Federal Communications Commission  
**Date** Adopted May 13, 1999 and Released June 9, 1999  
**Revision** None
- Reference** /2/  
**Designation** TIA/EIA-136  
**Name** 800/1900 MHz TDMA Cellular - Radio Interface - Mobile Station-Base Station  
Compatibility  
**Source** TIA  
**Date** October 16, 1998  
**Revision**

### 1.3. Background

While the Commission approved three proposed 911 call processing modes, they also stated general principles for other acceptable modes, and encouraged the development of further improvements in 911 call completion, including the extension of improved calling methods to digital services. Ericsson supports the interest to include digital technology in the call completion methods and has documented the digital E911 call process methodology that increases the emergency call completion probability of the three FCC proposed techniques for E911 Emergency Call Completions by utilizing the digital and analog capabilities in a dual-mode TDMA handset.

- The FCC released the Second Report and Order (R&O) addressing E911 Emergency Call Completion on May 13, 1999.
- The R&O addressed needed improvements in the analog cellular phone to successfully complete a wireless 911 call.
- The R&O require cellular phones that operate in an analog mode to implement any one of the three defined methods when processing a 911 emergency call.
- The FCC R&O outlined the five basic principles that all alternative methods are required to meet:
  - Improving call completion rate so far as practicable;
  - Route E911 call, where possible, to the preferred carrier;
  - No disruption of the overall operation of the 911 service;
  - The call methodology must address the “lock-in” problem; and
  - The benefits of the calling mode to public safety should outweigh associated costs.
- The R&O defined three approved call completion methods that satisfy the E911 rule:
  - Automatic A/B Roaming- Intelligent Retry
  - Adequate / Strongest Signal
  - Selective Retry
- The R&O encourages efforts to improve the E911 Call Completion methods to include digital services.

## 2. Ericsson Proposal

### 2.1. Ericsson Emergency Call Completion Proposal

- Ericsson's proposal applies the concepts of the FCC's call completion Report and Order to TDMA/ analog capable dual mode cellular handsets.
- This proposal will enhance 911 call processing for TDMA/ analog dual mode cellular handsets by increasing the probability that service will be found on an analog OR digital channel.
- The methodology is based upon the Automatic A/B Roaming option detailed in the FCC Report and Order, and additionally complies with the emergency call procedures defined in TIA/EIA 136.
- If the handset already has service on a control channel (analog or digital) when an emergency call is placed, the mobile will immediately initiate the call on that channel.
- If the mobile does not currently have service when an emergency call is placed, the mobile will follow the TIA/EIA 136 compliant emergency call scanning procedures as defined below. If a control channel is found at any point in the following scanning procedure, the emergency call will be immediately placed.
  1. Search for ACCs in the 800 MHz "a" and "b" cellular bands
  2. Search for service following the customer defined band order list (IRDB), allowing service on ANY control channel (analog or digital) that is found (even if that system is marked as ineligible within the mobile)
  3. Search for service in ALL frequency bands in which the handset is capable of operating, without restricting operations to the customer or operator defined band order list
- If the mobile station does not receive a voice channel assignment after exhausting all allowable emergency call origination attempts on the current band, the mobile station will continue scanning for service on other bands.
- Once an emergency call is placed, the handset will attempt to find service and complete the call, until the user manually ends the call attempt or power is lost.
- When placing an emergency call on a digital system, the handset will inform the base station directly (via protocol messaging) that an emergency call is proceeding, thus eliminating the delay associated with emergency number dialed digit matching further back in the network. When the base station receives this message, it connects the user to emergency service regardless of the actual number dialed. This allows users to define an

emergency number in the handset other than 911 (for example, European customers might be more familiar with 112 as an emergency number). During terminal provisioning up to 3 custom emergency numbers, in addition to 911 which is always recognized as an emergency number, can be programmed into the terminal memory for more direct (via protocol messaging) call placement.

- Feedback will be given to the user regarding call status during the emergency call.
- If a call is dropped or released, the handset will attempt to acquire service on the same band. If service cannot be obtained on this band, the handset will search for other systems as detailed above.

## **2.2. User Characteristics**

From the service point-of-view, the user will be provided with audible and visual feedback in the following scenario:

When the E911 emergency call is placed, the mobile will provide the user with an effective audible and/or visual feedback when the emergency call processing is underway.

## **3. TIA / EIA Compliance**

### **3.1. TIA/EIA 136 rev A Emergency Call Procedures**

The following has been copied from TIA/EIA 136-123A.

#### **Emergency Call Procedure**

If an emergency call is being attempted and either:

- If there is no service available due to a failure of the IR scanning procedures to find a Home, Partner, Favored, or Neutral SP or
- the mobile station does not receive an AVC or DTC assignment after exhausting all allowable origination attempts,

then the mobile station shall search for any service in the following order, and originate the emergency call if a control channel is found:

1. ACCs in the 800 MHz "a" and "b" cellular bands.
2. Power-up Scan without regard to SP categories but using the band order specified in the IRDB.
3. All bands, without regard to band order specified in the IRDB.

If the mobile station does not receive an AVC or DTC assignment after exhausting all allowable emergency call origination attempts on the current band, the mobile station shall continue scanning for service on other bands.

## **4 Ericsson Enhancements**

### **4.1 Enhancements**

- Ericsson proposal includes all TDMA digital dual mode or dual band mobiles manufactured by Ericsson.
- Ericsson proposal attempts call completion on all systems on which the mobile is capable of operating and all modes – both analog and digital.
- Ericsson proposal meets the FCC Commissions five basic principles as stated for any alternative proposals.
- Ericsson proposal supports attempting an E911 call when there is service available.
- Ericsson proposal supports attempting E911 Call when there is no service available.
- Ericsson proposal supports attempting E911 calls with No AVC or Other Traffic Channel Assignment after Exhausting all Emergency Attempts on the Current Band
- Ericsson proposal supports attempting E911 calls when the mobile fails to detect an ACC on both “a” and “b” cellular bands when No Service Available
- Ericsson proposal supports Audible and Visual Feedback to the consumer when the E911 Call Processing is underway.
- Ericsson proposal supports the use of IS-136 Emergency Call procedures to improve the call completion percentage, speed up call connection, and establish call priority within the network.
- Ericsson proposal supports the use of the higher capacity TDMA Network.

## Appendix A

### Terms and Definitions

The following has been copied from TIA/EIA 136.

**Analog Control Channel (ACC).** A channel used for the transmission of digital control information from a base station to a mobile station or from a mobile station to a base station.

**Analog Voice Channel.** A channel on which a voice conversation occurs and on which brief digital messages may be sent from a base station to a mobile station or from a mobile station to a base station.

**Base Station.** A station in the Domestic Public Cellular/PCS Radio Telecommunications Service, other than a mobile station, used for radio communications with mobile stations.

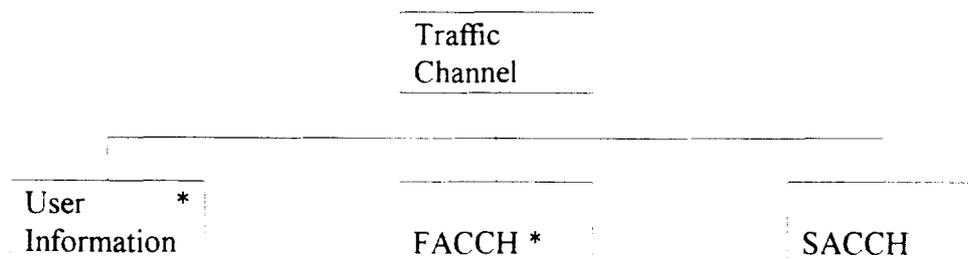
**Dedicated Control Channels.** A channel used for the transmission of digital control information from either a base station or a mobile station.

**Home System.** The system which is transmitting a SID which is recognized by the mobile station as the "Home" SID.

**Mobile Station.** A station in the Domestic Public Cellular/PCS Radio Telecommunications Service intended to be used while in motion or during halts at unspecified points. It is assumed that mobile stations include portable units (e.g., hand-held personal units) and units installed in vehicles.

**Release Request.** A message sent from a mobile station to a base station indicating that the user desires to disconnect the call.

**Traffic Channel.** That portion of the digital information transmitted between the base station and the mobile station, or between the mobile station and the base station, that is dedicated to the transport of user and signaling information as depicted in the figure below.



- FACCH and user information cannot be sent simultaneously.

**Acronyms and Abbreviations**

ACC	Analog Control Channel
AVC	Analog Voice Channel
BS	Base Station
CC	Control Channel
DTC	Digital Traffic Channel
FCC	Federal Communications Commission
IR	Intelligent Roaming
IRDB	Intelligent Roaming Database
MS	Mobile Station
PCS	Personal Communication Service
SID	System Identification
SP	Service Provider