CTIA
Building The Wireless Future
Cellular Telecommunications Industry Association

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

January 29, 1999

Ms. Magalie Salas
Secretary
Federal Communications Commission
The Portals
445 Twelfth Street, S.W.
12th Street Lobby, TW-A325
Washington, DC 20554

Re: Ex Parte- Strongest Signal
CC Docket No. 94-102

Dear Ms. Salas:

On Thursday, January 28, 1999, Brian Fontes, Senior Vice President, Policy and Administration; Michael Altschul, Vice President/General Counsel; Randy Coleman, Vice President, Regulatory Policy; Art Prest, Vice President, Science and Technology; Edward Hall, Assistant Vice President, Technology and Network Operations; and Timothy Jefferies, Manager, Certification Program, representing the Cellular Telecommunications Industry Association (CTIA), held a roundtable discussion on the operation of Automatic A/B Roaming as a possible solution for improved completion of 911 calls from a wireless handset. In November 1998, Dan Grosh, Special Counsel, Policy Division, Wireless Telecommunications Bureau, requested responses to certain questions regarding Automatic A/B Roaming. CTIA and TIA Committee TR 45 filed a joint response on December 4, 1998. The FCC then propounded five follow-up questions, which were the subject of the roundtable discussion. All documents, including the FCC's follow-up questions are attached to this letter.

CTIA Members Represented
Andrew Woessner, Allen Telecommunications
Joseph Abboud, Allen Telecommunications
Arjun Krishnan, Nokia
John Kalenowsky, Motorola
John Kay, Motorola-TIA Committee TR 45, Chair

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Wireless Telecommunications Bureau
Mr. Ron Netro, Senior Engineer, Policy Division
Ms. Won Kim, Attorney Advisor, Policy Division

Mr. Dan Grosh, Special Counsel, Policy Division
Mr. Marty Liebman, Engineer, Policy Division
Mr. John Cimko, Chief, Policy Division
Ms. Nancy Booker, Deputy Chief, Policy Division

Office of Engineering & Technology
Ms. Karen Rackley, Chief, Technical Rules Branch, Policy and Rules Division

Pursuant to Section 1.1206 of the Commission's Rules, an original and one copy of this letter and the attachments are being filed with your office. If you have any questions concerning this submission, please contact the undersigned.

Sincerely,

Dee Yankoskie

Dee Yankoskie
Manager for Research

Follow-Up Questions On Automatic A/B Roaming

The question numbers refer to the questions in the original request (11/18/98) for information and to the CTIA/TIA responses (12/4/98).

Question 1 - Need more specificity. For example, how would Automatic A/B Roaming operate? When is a call considered "completed" to the preferred carrier so that it is not switched to the non-preferred carrier? Conversely, under what circumstances is the preferred carrier considered unable to process the 911 call? Is there a definite criteria or defining point in the call process where completion, or not, is determined? E.g., what task(s) not completed means a call attempt has not been processed successfully?

Question 2 - We are not clear what your answer is to the original question, i.e., whether it is possible for a call to be locked-in to the A (preferred) carrier. Is the answer to the original question "Yes, it is possible for a call to be locked-in to the A (preferred) carrier so that the call would not be switched in any case in which the caller could not in fact communicate on the voice channel."

Is this true for the following call completion or programming modes:

- A preferred/B preferred
- Strongest/adequate signal
- Automatic A/B Roaming

To the extent possible, specify the circumstances under which this sort of locking-in of calls can occur.

Question 4 - Aside from the fact that handset modifications would be required and that local programming would be overriden for 911 calls, is it anticipated under Automatic A/B Roaming that the same basic call completion process and completion criteria would be applied to 911 calls as applies to ordinary calls. What we are trying to understand is whether Automatic A/B Roaming requires or permits handsets to treat 911 calls differently in ways other than overriding the usual local programming, specifically the overriding of the A-only and B-only programming modes. In other words, does Automatic A/B Roaming act like A-preferred/B-preferred even though the local programming is in an "only" mode? If not, describe differences.

Question 5 - Relative to Question 1 with regard to Automatic A/B Roaming proposal, is there a maximum amount of time that can elapse before a call is determined not to have been processed or completed, after which it would be transferred to a non-preferred system for handling? If so, what is that maximum elapsed time? (A flow chart describing the logic of the Automatic A/B proposal would be very useful.)

Likewise, what is the estimated maximum time to complete the Strongest/Adequate Signal logic, i.e., scan the preferred carrier's control channels, measure and compare the strongest to an established threshold, store that channel and its signal strength, scan the non-preferred carrier's control channels, select the strongest of these latter channels, compare for the strongest of the preferred and non-preferred carriers control channels, select the strongest of these two channels? If possible, relate the estimated elapsed time with each task. (If you believe additional tasks are needed or must be performed, please specify and include elapsed time.)

Question 10 - In the CTIA-TIA answer, it is argued that Automatic A/B Roaming is superior to Strongest/Adequate Signal because Automatic A/B Roaming functionality is invoked only as necessary, i.e., for a small minority of 911 call attempts. Strongest/Adequate Signal is said to lead to more calls being processed by the non-preferred carrier. In that the specific circumstances under which Automatic A/B Roaming will transfer calls to the non-preferred carrier are not clear to us, as our earlier follow-up questions indicate, the basis for this claim is also not clear to us. Also, how is the conclusion in your original response reached? For example, is it that many calls will be handled by the preferred carrier even though the control channel signal strength does not meet the threshold established for the Strongest/Adequate Signal proposal?

Attachment 1: A/B Roaming Description for 911 calls - How does it differ from current A/B Roaming for regular calls? Would A/B Roaming be automatically programmed for all 911 calls (i.e., not able to be manually over-ridden by the user, like regular A/B Roaming)? How are the border concerns that you raise handled in the current "preferred" modes? What is considered an "insufficient signal to establish and maintain adequate communications?" (see paragraph two, fifth sentence)

Automatic A/B Roaming: Industry's response to the FCC

1. How would Automatic A/B Roaming operate? Are there specific criteria for determining when to switch call to B (non-preferred) carrier? If there are no specific criteria, are there limits on the range of possible criteria a handset or carrier may apply?

   See attached 2 documents.

2. Is it possible for a call to be locked-in to the A (preferred) carrier so that the call would not be switched in any case in which the caller could not in fact communicate on the voice channel? If so, under what circumstances?

   No one has yet proposed a solution that promises to complete every 9-1-1 call from a wireless handset. There exists a small probability that any one of a number of circumstances (e.g.: signal strength or interference on the reverse control channel or voice channel; traffic congestion; base station equipment failure) can prevent effective communication on the voice channels associated with the selected control channel.

   Automatic A/B Roaming is more likely to complete 9-1-1 calls than "strongest" (or "adequate") signal. As the record in CC Docket 94-102 makes clear, the use of "strongest signal", or "adequate signal" will not preclude this phenomena from occurring because the availability of strong or adequate control channel does not indicate the availability of a voice channel, and by directing all 9-1-1 calls to a single carrier, "strongest signal" would increase the likelihood of blocking by using all available voice channels in the cell or sector. However, the use of Automatic A/B Roaming would reduce the probability of such blocking by distributing emergency calls more evenly across both carriers' networks.

3. Is it correct that Automatic A/B Roaming requires separate treatment of 9-1-1 calls, in the sense that those calls would be routed in accordance with Automatic A/B Roaming even if the handset is programmed to operate in some other mode for other calls, e.g., A only?

   Yes, using "Automatic A/B Roaming", 9-1-1 calls will be treated differently from all other calls. Regardless of how the phone is programmed (e.g., A Only, B only) the phone will attempt to complete 9-1-1 calls using the Automatic A/B Roaming functionality. Refer to the attached documents.

4. Would Automatic A/B Roaming require any differences in the way handsets handle 9-1-1 calls as compared with ordinary calls?

   Yes, as explained in question #3. To incorporate the "Automatic A/B Roaming" capabilities the software/firmware used in analog phones would need to be modified. Modifications in the field are not possible and the manufacturers believe that a minimum of six months would be required to begin manufacturing new analog phones that incorporate the "Automatic A/B Roaming" capability

function. The question concerning the feasibility of including Automatic A/B Roaming to the analog portion of dual and multi-mode handsets has only recently been raised, and at present, handset manufacturers are still investigating whether Automatic A/B Roaming can be applied to the analog portion of dual/multimode phones, and in particular, whether including Automatic A/B Roaming in such phones will add complexity and require redesign of such handsets.

9. Does Automatic A/B Roaming include, or is it compatible with, a manual backup mode such as that proposed by Bell Atlantic Mobile that would allow the user to switch the call to a different carrier than that selected by Automatic A/B Roaming?

   The manual backup mode proposed by Bell Atlantic Mobile is called "Selective Retry", and it is not included in Automatic A/B Roaming which automates this process without requiring intervention by the caller. While "selective retry" is not incompatible with Automatic A/B Roaming, it would not appear to have any benefit given the handset's ability to automatically override the preferred carrier programming and seek the non-preferred carrier in the event that the preferred carrier is unable to process a 9-1-1 call attempt.

10. In general, in what ways is Automatic A/B Roaming superior in completing 9-1-1 calls to current practice and rules, A/B, and Strongest/Adequate Signal? In what ways is it inferior?

    We are not aware of any area where Automatic A/B Roaming is inferior to the Strongest/Adequate Signal proposal. Automatic A/B Roaming enhances emergency call completion, and is compatible with existing network registration, call set-up and processing of analog cellular calls, and works within the existing technical standards.

    Automatic A/B Roaming functionality is invoked <u>only as necessary</u> to complete a 9-1-1 call when the preferred carrier is unable to process the 9-1-1 call (i.e., for a very small minority of 9-1-1 call attempts). On the other hand, based on the Dallas and Atlanta field data placed in the record of CC Docket 94-102 by the Ad Hoc Alliance, strongest signal and adequate signal approaches result in 9-1-1 calls being processed by the non-preferred carrier approximately <u>50% of the time</u>. Further analysis of the Dallas and Atlanta field data would indicate a random distribution of forward control signal strength, so that that when the preferred carrier is below the proposed adequate signal threshold, in most instances, so is the non-preferred carrier. This calls into further question the claims advanced by the Ad Hoc Alliance. The Dallas and Atlanta field data also shows that Automatic A/B roaming would have allowed for call completion, except in a few instances where <u>neither</u> carrier would have been able to provide a satisfactory connection, <u>i.e.</u>, the Rock Creek Park type of situation, where neither carrier provides coverage.

    Because the strongest signal and adequate signal approaches will divert 9-1-1 calls that could otherwise be completed successfully by the preferred system,

Attachments

1. Description of Automatic A/B Roaming

2. TIA correspondence on call origination (from the Chair of TIA TR45.1 Analog Subcommittee)

unable to process the 9-1-1 call attempt. TIA indicated that such an approach can be implemented within existing standards and is compatible with present network registration, control, and call setup procedures and functions.

Automatic A/B Roaming capability appears to be the best alternative for enhancing call completion for 9-1-1 calls. Of the alternatives considered by TIA, this approach minimizes potential unintended consequences while meeting the basic objectives of the FCC in a timely manner. This concept is also acceptable to carriers, manufacturers, and the public safety community.

The attached document provides an overview of a call flow (including network registration, control, call setup procedures and functions) that might occur using "Automatic A/B Roaming" for a 911 call. In essence, using "Automatic A/B Roaming", if an A side customer's 9-1-1 call can not be completed by the A side carrier, the phone will switch to the B side and scan the B side to complete the 9-1-1 call.

In other words, the mobile should return to scanning the control or paging channels of the system (A or B) on which the access was just attempted, unless the preferred system selection has been changed.

The access can be broken down into a couple of major phases: Determining parameters of the system that control the access attempt, transmitting the access to the base station, and waiting for an order from the base station.

Regarding the selection of the control channels from which to receive the parameters for accessing the system, the air interface specification is loosely worded. In section 2.6.1.1.2 UPDATE OVERHEAD INFORMATION the document states "If the mobile station cannot complete this task on the strongest dedicated control channel, it *may* (my emphasis) tune to the second strongest dedicated control channel and attempt to complete this task within a 3-second interval." Thus, no signal level thresholds for access are specified, the ability to receive the overhead information is the indicator that the mobile can attempt to be served by the system.

If the mobile cannot successfully receive the overhead information on the current "serving system" (A or B), it *may* try the other.

When attempting to transmit the access to the system for a call origination (section 2.6.3), the mobile sets a timer to "a maximum of 12 seconds" to complete the access, i.e. successfully transmit the origination request to the base station. Then the mobile scans the control channels and chooses "up to two channels with the strongest signals".

If the mobile fails to access the strongest channel, the air interface specification indicates in section 2.6.3.13 ALTERNATE ACCESS CHANNEL TASK that the mobile " *may* tune to the second strongest channel. Otherwise, if it fails on the second channel, the mobile "must enter the Serving-system Determination Task (2.6.3.12)."

Upon successfully transmitting the origination request to the base station, the mobile station sets a timer to 5 seconds to receive either an initial voice channel designation message, a directed retry message, an intercept order or a reorder message.

The initial channel designation message tells the mobile station to tune to the voice channel where the call will continue in the conversation state. Any failure on the voice channel (fade timer expires) sends the mobile back to the Serving-system Determination Task (2.6.3.12) to scan the preferred system control channels.

The directed retry message allows the system to indicate to the mobile a list of up to 6 other access channels to try. Either one additional access attempt from the list is allowed (using the Last Try flag, LT_s) or it can continue to try the channels until the 12-second access timer expires. If this fails, the mobile goes to Serving System Determination Task (2.6.3.12).

The other two messages, reorder and intercept send the mobile to the Serving-system Determination Task (2.6.3.12).

This is the extent to which EIA/TIA-553 specifies the relevant actions of the mobile station during an origination. If you have any questions, please contact me at your earliest convenience.

Regards,

John Kay

Chair, TIA TR-45.1

CC: John Marinho, Chair, TIA TR-45
Tim Jeffries, CTIA

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703/907-7770 • Fax: 703/907-7727 in association with the Electronic Industries Association

Telecommunications Industry Association

Committee TR45

Dallas TX
December 2 - 3, 1998

TITLE: **9-1-1 Call Completion, An Enhancement / Variation to Automatic A/B Roaming using "Intelligent Retry" as proposed by Motorola, Inc**

SOURCE: **Cellular Telecommunication Industry Association (CTIA)**
Ed Hall, AVP on behalf of the WEIAD

DISTRIBUTION: TR45 Committee and appropriate sub committees

CONTACT: Ed Hall, CTIA 202/736-3259

ABSTRACT: This contribution is for information / consideration purposes only. Contained is a contribution prepared by Motorola, Inc – Personal Communications Sector that was submitted at WEIAD – 6 (November 24, 1998) as an enhancement / variation to the proposed *Automatic A/B Roaming* functionality addressing CTIA's SRD on *9-1-1 Call Completion* (TR45/98.06.03.44). The WEIAD is forum composed of phone manufacturers, carriers public safety organizations and the Ad Hoc Alliance for Public Access to 9-1-1. The Forum provides periodic reports to the FCC.

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Baltimore, Maryland
November 24, 1998

WEIAD-6/98.11.24.10

Wireless E-911 Implementation Ad Hoc

TITLE: Proposal to Consider for Enhanced Completion of 911 Calls Initiated on Wireless Networks

DATE: November 24, 1998

SOURCE:

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ABSTRACT: "Intelligent Retry"

NOTICE: The information in this submission has been formulated by Motorola, Inc. (Motorola), to assist the Wireless E-911 Implementation Ad Hoc (WEIAD). This document is offered to WEIAD as a basis for discussion and is not binding on Motorola. The requirement(s) or recommendation(s) are subject to change in form and in numerical values after more study. Motorola specifically reserves the right to add to, or amend, the quantitative statements made herein. Nothing contained herein shall be construed as conferring by implication, estoppel, or otherwise any license or right under any patent, whether or not the use of information herein necessarily employs a claim of any existing or later issued patent.

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January 13, 1999

Ms. Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
The Portals
445 Twelfth Street, S.W.
12th Street Lobby, TW-A325
Washington, D.C. 20554

Re: Ex Parte Presentation
CC Docket No. 94-102

Dear Ms. Salas:

Wireless Consumers Alliance ("WCA") is a nonprofit corporation which was organized to support and continue the efforts initiated by the Ad Hoc Alliance for Public Access to 911 ("Alliance") *in* Docket 94-102. Pending before the Commission is a proposal made by the Alliance that would require cellular telephones to automatically select the strongest available compatible signal when 911 is dialed. ("Strongest Signal"). This proposal was recently modified to establish a signal threshold before the Strongest Signal selection is implemented. ('-Strongest/Adequate Signal"). In response to this modification, CTIA proposed, in the alternative, that cellular telephones be programed to automatically switch to an A/B mode when 9 11 is dialed. ("Automatic A/B Roaming").

On December 4, 1998, The Cellular Telecommunications Industry Association ("CTIA") filed a response to ten questions by Dan Grosh, Special Counsel in the Policy Division, about Automatic A/B Roaming. We disagree with *some* of the statements and conclusions reached by CTIA in its response ("CTIA Response"). This letter is for the purpose of clarifying and correcting the record and taking issue with some of the claims and assertions made in the CTIA Response.

Background

On October 27, 1995, the Strongest Signal proposal was filed with the Commission by the Alliance. Specifically, the proposal was to amend "Part 22, sub part k, paragraph 22.933, which incorporates OET-53 cellular system mobile station-land station compatibility specifications, to define how mobile telephones operate. Paragraph 2.6 3 2 of OET-53 defines how a mobile unit

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will scan its preferred system channels during call origination." The Alliance proposed the following addition to the beginning of this paragraph:

> "If the purpose of this 'origination' is to complete a call to 911 (an emergency call), the mobile station must examine the signal strength of all of the control channels assigned to System A and System B and select the channel with the strongest signal. In all other cases, ..."

The Strongest /Adequate Signal proposal was an effort on the part of the Alliance to address the "concern" of the 911 administrators that Strongest Signal would divert 911 calls from the preferred system even if there was an adequate signal level then available to establish voice communications over that system. Under the Strongest/Adequate Signal proposal, if sufficient signal (-80 dBm or stronger) is available from the preferred carrier, then. the emergency call will use the preferred carrier's system. If, however, such signal strength is below this threshold, then the handset will scan both systems for the best available channel.

Suggested rule language for Strongest/Adequate Signal

The Alliance did not propose language for the Strongest/Adequate Signal rule change. We suggest that OET-53 be amended by the insertion of the following text at the start of the **second paragraph of Paragraph 2.6.3.2:**

> "If the purpose of this 'origination' is to complete a call to 911 (an emergency call), and the signal strength of the strongest channel is not equal to or greater than -80dBm, the mobile station must examine the signal strength of all of the control channels assigned to System A and System B and select the channel with the strongest signal. The mobile station must then tune to the strongest .."

Incorrect and misleading statements in the CTIA Response

The CTIA Response states that Automatic A/B Roaming can be implemented "within the existing industry standard with no need for an unprecedented change to the cellular system compatibility specifications requested by the Ad Hoc Alliance." In fact, both Automatic A/B Roaming and Strongest Signal operate within the existing industry standard. Both use an "emergenoy key" to change handset system selection when 9- 1- 1 is dialed. Automatic A/B Roaming changes the handset selection from one side "only" to "preferred." Strongest Signal changes the handset selection to all channels.'

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[1] The Commission asked about the operation of Automatic A/B Roaming on dual mode and multimode handsets. A failure to complete a call in a digital mode will result in a default to the analog mode in dual mode and multimode handsets. Strongest Signal will operate when these handsets are in the analog mode.

The CTIA Response contends that "the Strongest Signal works against 9-1-1 call completion by forcing handsets to reregister on the non-preferred system." This statement is not correct. The specified call process step (OET-53, ¶ 2.6.3.2) is contained within the System Access task (¶ 2.6.3) and the standards clearly specify that **no registration event is necessary** to complete the call origination task regardless of which System in ultimately accessed. The Strongest Signal proposal removes the single side scanning limitation, which is programmed into the handset, to allow the handset to scan of both sides to find the best available access channel when 911 is dialed.* There is no changing of "sides" since the handset considers all channels in making its initial choice. By comparison, Automatic A/B Roaming *does require* re registration when a handset fails to find service on its preferred side and "changes sides," which process takes more time to complete than Strongest Signal.

The CTIA Response says that the Strongest/Adequate Signal "sets a **-80dBm** threshold for 9-1-1 calls at which point the handset would switch from the preferred to the non preferred carrier." This statement is also incorrect. The Strongest/Adequate Signal proposal simply states that all channels from both sides will be examined ***if* the** preferred carrier's strongest channel is below **-80dBm**. Even if the signal is below the **-80dBm** threshold, the best available channel might be from the preferred carrier. The objective of Strongest Signal is to secure the best channel of communication then available to handle the emergency call.

Attached to the CTIA Response is a "background" paper (Attachment 1.). This paper contains some admissions which underscore why the Commission should adopt the Strongest Signal rule. Specifically, the wireless industry now admits the continuing existence of coverage "holes" in the wireless network. Importantly admitted is the fact that:

> "a wireless telephone user who is located in such a hole may find that there is no signal or *insufficient **signal** to establish and maintain adequate communications over the wireless system accessed by the **handset**.* In the case of no signal from the preferred system, programming a purely analog handset to use A over B or B over A will allow the 9-1-1 call to be completed by the non-preferred carrier if this carrier has coverage at that location." (Emphasis added).

. *"An insufficient signal to establish and maintain adequate communications"* is the reason why Marcia Spielholz simply heard "dead air" as she made repeated attempts to call 9-1-1 over her cellular phone and the reason why the emergency calls **from** the Lechuga's cellular phone were not connected. As both Trott and ICSA attest, this problem occurs in approximately one third of the time in rural and suburban areas and is far more prevalent than the "hole" where no signal is available. Automatic A/B Roaming *does not* address the insufficient signal problem -- but Strongest Signal does.

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[2] Cellular telephones scan both sides when turned on and then look for the programmed instructions. Strongest Signal simply by-passes the single side program instruction to return to the original scanning mode of all channels when 9-1-1 is dialed.

Also attached to the CTIA Response is a letter from John Kay, the chairman of Telecommunications Industry Association ("TIA") subcommittee 45.1 .[3] (Attachment 2). Mr. Kay states that "no signal level thresholds for access are specified, the ability to receive the overhead information is the indicator that the mobile can attempt to be served by the system."- We know from the call detail report of the attempts to use a cellular telephone from the Lechuga accident scene to place emergency calls that the overhead information was received. As this call detail report amply demonstrates, simply being able to lock on and decode the overhead information *does not* guarantee that the handset will be able to access the system. This problem is compounded by the fact that when the handset hears and decodes the overhead information it will be prevented from switching-tothe other cellular system. In sum, there is no question that an "***insufficient signal*** *to establish and maintain adequate communications* " can and will lock the handset into a position where it cannot make a voice call. This is the correct answer to question 2 instead of the dissembling reply in the CTIA Response.

The CTIA Response describes Automatic A/B Roaming in terms. that obfuscate that process. For example, the use of the phrase *"unable to process the* 9-1-I *call attempt* " implies that there is some analysis involved. In fact, the switch from one side to the other under the Automatic A/B Roaming proposal only occurs when there is no signal - period. Automatic A/B Roaming does not perform any complex analysis of system quality, voice channel availability or traffic congestion. It merely looks for the strongest preferred control channel and, if one is available, sends the 9-l-l call into the system over that channel with the hope that it will be connected. The channel provided may be of very poor quality, the call may be dropped or the caller may be locked into dead air, even though a good channel of communication may be available over the other system.[4]

One of the principal criticisms of Strongest Signal has been its use of the strongest forward control channel signal which, it is said, will be fraught with unintended consequences and will fail to complete 9-l - 1 calls. Since the introduction of cellular service, the only method for selecting which cell site to access when placing a call is to select the one with the strongest forward control channel signal. (See OET-53 ¶ 2.6.3.2). This selection process continues to be the *only* method in use today and is the *only* method allowed and approved by the existing cellular standards. Automatic A/B Roaming uses *this very same process* which CTIA earlier criticized as a defect of Strongest Signal. Both proposals do and must use the strongest forward control channel as the access pathway to initiate the call. The difference between Automatic A/B

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[3] This letter bears a disclaimer which states that it does not reflect "the corporate policies or the views of the Telecommunications Industry Association".

[4] The FCC asked for comment about the "double push" proposal made by Bell Atlantic Mobile. The CTIA Response seems to confuse this proposal with the Motorola "Selective Retry". We have seriously considered and rejected both of these proposals because they are a very inferior solution to the problem and would increase consumer confusion and unacceptably extend the time between the call attempt and connection.

Roaming and Strongest Signal in using this established channel selection process is that Strongest Signal eliminates the artificial partition which prevents handsets from scanning ***all*** of the available control channels. As a result, Strongest Signal doubles the number of pathways that are available in time of emergency.

Conciusion

Despite the fact that more than half of the existing wireless customers were persuaded to buy service for safety and security purposes, the wireless industry is extremely averse to handling emergency calls for liability and other reasons. The Commission has held that the wireless carrier's self interest in not handling emergency calls **from** nonsubscribers must give way to the public interest. Since Strongest Signal will deliver emergency calls **from** nonsubscribers, the wireless industry and their supporters have contrived reasons to resist the adoption of this rule change, the latest being Automatic A/B Roaming. The Strongest Signal rule change is clearly in the public interest because it will provide the consumer with the best available channel of communication and thus the best chance of completing the emergency call.

Pursuant to Section 1.1206 of the Commission's Rules, an original and one copy of this letter is being filed with your office. If you have any questions concerning this submission, please contact the undersigned.

Sincerely,

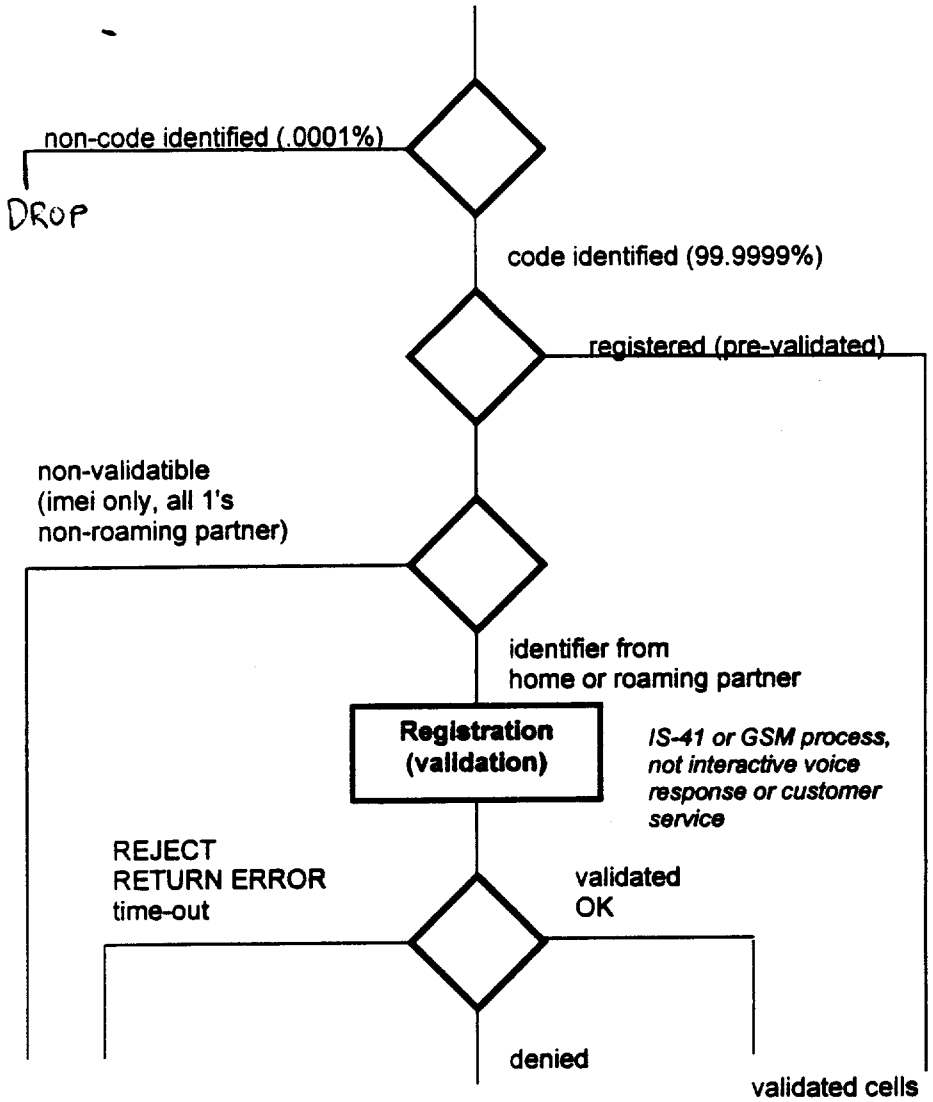
Carl Hilliard

cc: Wireless Telecommunications Bureau
Mr. John Cimko, Chief, Policy Division
Ms. Nancy **Boocker**, Deputy Chief, Policy Division
Mr. Dan Grosh, Special Counsel, Policy Division
Ms. Won Kim, Attorney, Policy Division
Mr. Marty **Liebman**, Engineer, Policy Division
Mr. Ron Netro, Senior Engineer, Policy Division

Office of Engineering and Technology
Mr. Dale Hatfield, Chief
Mr. Bruce **Franca**, Deputy Chief
Mr. Julius Knapp, Chief, Policy & Rules Division

WEIAD/99.01.22.

Call Flow for 9-1-1



Phase 0 9-1-1
Route the call to the PSAP
Maybe cell/sector
Maybe latitude/longitude
No call back

Wireless Enhanced 9-1-1
Phase 1 cell site/base station/sector
Phase 1 call back number
Phase 2 latitude and longitude

Exceptions:
international callers
originate only phones
"special" phones

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TR-45.1 Sub-Committee
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CONTRIBUTION

Title

Proposal for Enhanced Completion of 911 Calls on Wireless Networks

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Abstract

This contribution addresses modifications to EIA/TIA 553-A (SP-3598) in an attempt to resolve issues surrounding E911 service.

Recommendation

Review and adopt.

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Proposal

Section 2.6.1 Initialization

Add new paragraph:

"Set *emergency_call* to disabled."

Section 2.6.1.1.2 Update overhead information

Replace last paragraph:

"If the mobile station cannot complete this task on the strongest dedicated control channel, it may tune to the second strongest dedicated control channel and attempt to complete this task within a second 3 second interval. If it cannot complete this task on either of the two strongest control channels, the mobile station may check the serving-system status: If the serving-system status is enabled, it may be disabled; if the serving-system status is disabled, it may be enabled. The mobile station must then enter the Scan Dedicated Control Channels Task (see §2.6.1.1.1)."

with:

"If the mobile station cannot complete this task on the strongest dedicated control channel and *emergency_call* is disabled, it may tune to the second strongest dedicated control channel and attempt to complete this task within a second 3 second interval. If the mobile station cannot complete this task on the strongest dedicated control channel and *emergency_call* is enabled, it must tune to the second strongest dedicated control channel and attempt to complete this task within a second 3 second interval.
If the mobile station cannot complete this task on either of the two strongest control channels and *emergency_call* is disabled, it may check the serving-system status: If the serving-system status is enabled, it may be disabled; if the serving-system status is disabled, it may be enabled.
If the mobile station cannot complete this task on either of the two strongest control channels and *emergency_call* is enabled, it must check the serving-system status: If the serving-system status is enabled, it must be disabled; if the serving-system status is disabled, it must be enabled.
The mobile station must then enter the Scan Dedicated Control Channels Task (see §2.6.1.1.1)."

Section 2.6.3.4 Update overhead information

In the "Overload Control Message" bullet item, first paragraph, replace:

"- If this access is an origination, the mobile station must examine the value of the overload class field (OLC) identified by $ACCOLC_p$. If the identified OLC field is set to '0', the mobile station must exit this task and enter the Serving-System Determination Task (see §2.6.3.12); if the identified OLC field is set to '1', the mobile station must continue to respond to messages in the overhead message train."

with:

"- If this access is an origination, the mobile station must examine the value of the overload class field (OLC) identified by $ACCOLC_p$. If the identified OLC field is set to '0' and *emergency_call* is disabled, the mobile station must exit this task and enter the Serving-System Determination Task (see §2.6.3.12); if the identified OLC field is set to '1' or *emergency_call* is enabled, the mobile station must continue to respond to messages in the overhead message train."

Section 2.6.3.12 Serving-system determination

Replace the first paragraph:

"If this task is entered as a result of a power down registration attempt the mobile station must immediately power down. If this task is entered for any other reason, and if the serving-system status does not correspond to the preferred system, the mobile station may enter the Retrieve System Parameters Task (see §2.6.1.1); otherwise, it must enter the Paging Channel Selection Task (see §2.6.1.2)."

with:

"If this task is entered as a result of a power down registration attempt the mobile station must immediately power down. If this task is entered for any other reason, and if the serving-system status does not correspond to the preferred system and *emergency_call* is disabled, the mobile station may enter the Retrieve System Parameters Task (see §2.6.1.1). If this task is entered for any other reason and if the serving-system status does not correspond to the preferred system and *emergency_call* is enabled, the mobile station must enter the Retrieve System Parameters Task (see §2.6.1.1). Otherwise it must enter the Paging Channel Selection Task (see §2.6.1.2)."

Section 2.6.3.13 Alternate access channel

Replace the first paragraph:

"If the mobile station is tuned to the strongest access channel, it may tune to the second strongest channel and then enter the Retrieve Access Attempt Parameters Task (see §2.6.3.3). Otherwise, it must enter the Serving-System Determination Task (see §2.6.3.12)."

with:

"If the mobile station is tuned to the strongest access channel and *emergency_call* is disabled, it may tune to the second strongest channel and then enter the Retrieve Access Attempt Parameters Task (see §2.6.3.3). If the mobile station is tuned to the strongest access channel and *emergency_call* is enabled, it must tune to the second strongest channel and then enter the Retrieve Access Attempt Parameters Task (see §2.6.3.3). Otherwise, it must enter the Serving-System Determination Task (see §2.6.3.12).

Issues for Discussion

The following items identify potential anomalies in the recommended implementation described above:

- While in Conversation (see §2.6.4.4), the mobile station may receive an Alert or Maintenance order, which will transition the mobile station to Waiting for answer (see §2.6.4.3.2). Upon entry to Waiting for answer, an alert timer is set to 65 seconds. Upon expiration of this timer, the mobile station will transition to Serving-system determination (see §2.6.3.12). This will leave *emergency_call* enabled. As this will be an abnormal termination of the 911 call, the mobile station will automatically reattempt the 911 origination upon reacquiring service.
- While in Conversation (see §2.6.4.4), the mobile station may receive an Alert or Maintenance order, which will transition the mobile station to Waiting for answer (see §2.6.4.3.2). While in Waiting for answer, the mobile station may receive a Release order, which will transition the mobile station to Release (see §2.6.4.5). This seems to be an abnormal transition, since it is unnecessary to transition through Waiting for answer in order to release the call. Note, however, that this transition causes *emergency_call* to be disabled, and the 911 call will **NOT** be re-attempted in this case.
- While in Conversation (see §2.6.4.4), the mobile station may receive an Alert or Maintenance order, which will transition the mobile station to Waiting for answer (see §2.6.4.3.2). While in Waiting for answer, the mobile station may receive a Stop Alert order. This will transition the mobile station to Waiting for order (see §2.6.4.3.1) Upon entry to Waiting for order, an order timer is set to 10 seconds. Upon expiration of this timer, the mobile station will transition to Serving-system determination (see §2.6.3.12). This will leave *emergency_call* enabled. As this will be an abnormal termination of the 911 call, the mobile station will automatically reattempt the 911 origination upon reacquiring service.
- While in Conversation (see §2.6.4.4), the mobile station may receive an Alert or Maintenance order, which will transition the mobile station to Waiting for answer (see §2.6.4.3.2). While in Waiting for answer, the mobile station may receive a Stop Alert order. This will transition the mobile station to Waiting for order (see §2.6.4.3.1).). While in Waiting for order, the mobile station may receive a Release order, which will transition the mobile station to Release (see §2.6.4.5). This seems to be an abnormal transition, since it is unnecessary to transition through Waiting for answer and Waiting for order in order to release the call. Note, however, that this transition causes *emergency_call* to be disabled, and the 911 call will **NOT** be re-attempted in this case.
- If, during a 911 call, the radio link continuity is lost (SAT loss), the mobile station will transition to Serving-system determination (see §2.6.3.12). This will leave *emergency_call* enabled. As this will be an abnormal termination of the 911 call, the mobile station will automatically reattempt the 911 origination upon reacquiring service.
- If a 911 call is ended due to power down or low battery turn off, it is not necessary to disable *emergency_call*, since it is not intended to be a persistent variable.