

Ad Hoc Alliance for Public Access to 911

Alliance for Technology Access•Arizona Consumers League•National Consumers League•World Institute on Disability•National Emergency Number Association-California Chapter•Crime Victims United•Justice for Murder Victims•California Cellular Phone Owners Association•Florida Consumer Fraud Watch•Center for Public Interest Law•Consumer Action•Consumer Coalition of California•Consumers First•California Alliance for Consumer Protection•Californians Against Regulatory Excess•The Office of Communication of the United Church of Christ•Utility Consumer Action Network•Children's Advocacy Institute

March 20, 1998

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Magalie R. Salas
Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554-0001

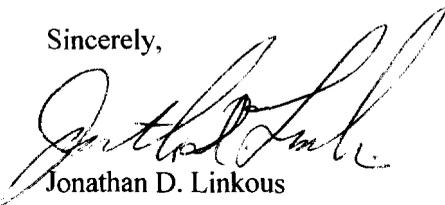
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

re: *Ex Parte* Filing
CC Docket 94-102, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems

Dear Ms. Salas:

Enclosed is a response prepared by Trott Communications on behalf of the Ad Hoc Alliance for Public Access to 911. The report was prepared in response to questions raised in the February 23, 1998 filing by three public safety communications groups regarding an earlier report filed by the Alliance on January 27, 1998.

Sincerely,


Jonathan D. Linkous
Washington Representative

cc: John Cimko
National Emergency Number Association
Association of Public Safety Communications Officials-International, Inc.
National Association of State Nine-One-One Administrators

enclosure

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This report is in response to the "concerns" raised by the Public Safety Communications organizations in their February 23, 1998 response to our report dated January 27, 1998. The concerns raised are the result of misconceptions and misunderstandings of the technical aspects of cellular phones, cellular systems, related cellular standards, and the Alliance's proposal. In order to better understand the issues and positions, we have formatted this response in a issue-answer format.

1. Issue: In areas where both cellular carriers provide an adequate signal level, will the Alliance's "Strongest Signal" approach reduce the ability and capacity of the cellular/911 systems to handle a high volume of simultaneous emergency calls, reduce the area capacity by 50%, overload the 911 trunk capacity of one carrier, and totally eliminate the other carrier?

Answer: This issue assumes a multiple call situation where many subscribers simultaneously report the same incident from essentially the same location, such as a busy freeway or other urban area. It further erroneously assumes that only one cell site from one of the two carriers provides the strongest signal to all of the callers. This premise leads to the assumption that this cell site will be overloaded and calls will be redirected to the next cell site of the same carrier, which may have a weaker signal than the competing cellular carrier and that one set of 911 trunks will be overloaded while the other carrier's trunks remain unused.

The studies previously performed and provided by the Alliance found that in most high density areas the signal strength of the two carriers are nearly equal. The study, which measured signal strengths in "core" areas, showed that in such areas, the strongest signal changes back and forth from one carrier to the other as the subscriber travels over very short distances. Thus the strongest carrier is likely to change from car to car along a traffic lane.

Based upon the empirical data collected and presented by the Alliance, the strongest signal approach will have the effect of distributing the 911 calls more or less equally between the cellular carriers in the high density core areas. Therefore, the hypothesis and resulting conclusions are both incorrect.

Due to the "distributing effect" discussed above, 911 trunk duplication will **NOT** be lost, "choke point" will **NOT** change, weaker carriers will **NOT** be totally eliminated, the ability to transport 911 calls will **NOT** be reduced, and other calls within the region will **NOT** be blocked. In essence, there will be no changes to cellular systems operation in the core urban areas.

Appendix 3 of that same report is useful to help understand the problem. The portable cellular handset is a 600mW device and a mobile cellular telephone is a 3W device. The difference in the mobile versus portable "Up-Link" power (from the mobile to cell or from the portable to cell) is 8db. This represents a five-fold advantage for the mobile unit in talk-back range to the cell site versus the portable's talk-back range. Balance between "Down-Link" power and "Up-Link" power is established by cell site design. The cells designed for "Portable Grade" coverage lie in the core of the cellular markets where market pressures for greater capacity in a limited area have forced the carriers to add cells in close proximity to each other. The "coverage" of these core cells is limited through careful antenna selection and power management to allow for the frequency reuse needed to increase traffic capacity. This results in hand-offs between cells occurring at relatively high signal strength levels and the portable enjoys a balanced environment between the "Up-Link" and "Down-Link" powers. The mobile unit power is throttled back to resemble the signal strength being presented to the cell from the portables; otherwise, the high-power mobiles would be received quite some distance away and interfere with the frequency reuse plan. Therefore, the mobile unit acts like and looks like another portable to the core cell sites.

Out in the suburbs and rural areas; however, the situation is reversed. The cells are designed for coverage not capacity and the link budgets are tailored for Mobile Grade Coverage. This means that the "Down-Link" power is increased to extend the area that the cell site can cover when talking to a mobile unit. The portable unit can hear the cell site signal when it is close to the tower and can easily talk back to the cell. As the units move further away from the cell site, they are ordered by the cell to increase their power output to compensate for the signal loss over distance. Remember, the mobile unit can increase its power output to 3W or 8db more signal than is possible from a portable unit. Therefore, the mobile unit can talk back to the cell site from anywhere within the designed coverage (i.e. Mobile Grade Coverage). The portable unit; however, runs out of steam and soon faces a dilemma where it can hear the cell site signal when it is quite removed from the cell site in areas where it can successfully pass data messages to register or originate calls, but it cannot be heard by the cell site when it reaches a voice channel and must transpond the SAT handshake signal that allows conversations to take place. Therefore, portable handsets can hear the cell site signal where it cannot talk back to the cell under any circumstances, but it will remain locked onto this cell site signal until it loses word sync or rescans and locates a stronger preferred cell site. It must be recognized that the robust data signaling can successfully pass a data message at signal levels that cannot support voice traffic.

As long as the portable handset can maintain word sync with the overhead data stream from the cell site, it will not seek another cell site, unless the periodic Rescan finds a stronger signal from the preferred system. When a call is originated by the user of a portable handset, the handset will Rescan its dedicated environment and seek the strongest control channel. If this signal is being provided by a "Mobile Grade Coverage" cell site and the portable is not in the "Portable Grade Coverage" area of the cell site (i.e. not close to the tower), the



The purpose of the Alliance's proposal is to insure completion of 911 calls where, without the strongest signal approach, no call from the affected subscriber will be completed to the Public Safety Answering Point.

2. Issue: Will the strongest signal concept impair the marketability of 911 location service?

Answer: This "concern" is based upon the assumption that subscribers will be unwilling to pay a surcharge for location service deployed in advance of Year 2001 if they do not have the assurance that this feature will be available to them when they dial 911. This issue was addressed in the report. The Alliance specifically asked us if the strongest signal feature should be capable of being disabled. Our response was, and is, that the strongest signal feature should be enabled by default, but easily disabled by consumers who wish to make that election. We feel that it is advisable to allow subscribers to knowingly disable the strongest signal feature at their leisure, rather than be required to enable the feature while involved in a stressful situation.

We understand the Public Safety community's position that they would prefer to receive a 911 call with location; however, we are sure that people who have been injured would have preferred that the call be completed without location rather than not completed by a system with location technology. Implementation of location technology will have no effect upon dropped or uncompleted 911 calls that could be supported by the Alliance's strongest signal proposal. The Public Safety report stated, "We can't help them if we can't find them." The Alliance contends that, "You can't help them if you can't hear them"; however, if you can hear them, at least they have the opportunity to tell you their location and the nature of their problem.

3. Issue: Will the presence of a weak and inadequate preferred signal prevent the handset from switching to the non-preferred system?

The Public Safety response disagrees with our statement that a weak signal where voice communication is not possible from a portable cellular phone can prevent a handset from switching to the other system. Their response also states that as long as a handset can register, be confirmed, then voice calls can always be carried.

Answer: Our statement that weak signal levels can prevent handsets from switching carriers is not a contention, it is a fact. Their statement that as long as a handset can register, be confirmed, then voice calls can always be carried is simply not true. For example, the Alliance's report concerning the Lechuga accident contains a cell site printout showing that the Lechuga phone was registered but that calls could not be completed due to weak signal level.



portable can successfully pass an origination order to the MTSO through the cell site and will receive a voice channel assignment. The portable will fail to connect on the voice channel due to its weak "Up-Link" signal, but will have succeeded as far as the 553 standards are concerned and it **WILL NOT** switch sides seeking a better pathway. Only when the portable fails to receive a voice channel assignment from the serving system at call origination, or when word sync is lost from the preferred system will the portable switch to the other side. The presence of even a weak and unusable (to the portable) signal will keep the handset on the preferred system and it will not access the other side. Clearly, the A over B and B over A is not a better solution than the Alliance's "Strongest Signal" proposal.

In order for the A/B or B/A to meet an equivalent level of service as the Alliance's Strongest Signal proposal, a method of determining adequacy of voice channel service must be established and the handset commanded to rescan all forward control channels upon loss of voice channel capability. This process **WILL** require a revision of the 553 Standard, since the subscriber units do not currently possess this function.

4. Issue: Is our statement that "the cell phone today already scans the full list of forward control channels (both A and B systems) during its power-on sequence and whenever signal is lost from the preferred system" inconsistent with pages 2-11 of ANSI/EIA/TIA-553-1989 STANDARDS, SECTION 2.6.1.1.1 (553 Standard)?

Answer: The short answer is "NO." The last paragraph of Section 2.6.1.1.2 of the 553 Standard (pages 2-12) STATES, "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)." This action will force the mobile station to examine all control channels when it encounters no service from its preferred system. This task is also initiated when a call origination is attempted and will result in the same scan. The 553 Standard shows that the mobile station already knows how to scan all of the control channels; therefore, no change to the standard is necessary to implement the Alliance's Strongest Signal proposal.

Conclusion: All of the negative comments concerning the Alliance's Strongest Signal proposal pose hypothetical situations where the proposal may have adverse effects upon cellular operations; however, these comments have never provided documented proof of the impact. Further, these comments have not provided documented proof that the Alliance's proposal can jeopardize safety as the Alliance has proven actual cases where death or serious bodily injury has resulted from not implementing the proposal.

