

VOICESTREAM WIRELESS  
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May 5, 2000

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

**Re: Notification of *Ex Parte* Contact in CC Docket No. 94-102**

Dear Ms. Salas:

Please be advised that on Thursday, May 4, 2000, Aerial Communications was merged into VoiceStream Wireless.

On May 1, 2000, Beth Frasco, Rob Rowe, and myself met with Daniel Grosh, Blaise Scinto and Patrick Forster of the FCC. The purpose of the meeting was to discuss Aerial's Petition for Waiver of certain of the Commission's E-911 Automatic Location Identification ("ALI") requirements. In particular, Aerial addressed accuracy levels of the handset, GPS and network solutions over time, possible deployment schedules, technology trials and comparison of Aerial's proposed waiver with that of other Petitioners. The presentation is summarized by the attached slides.

Pursuant to Section 1.1206 of the Commission rules, two copies of this letter and the slides have been filed with your office. Please contact me with any questions.

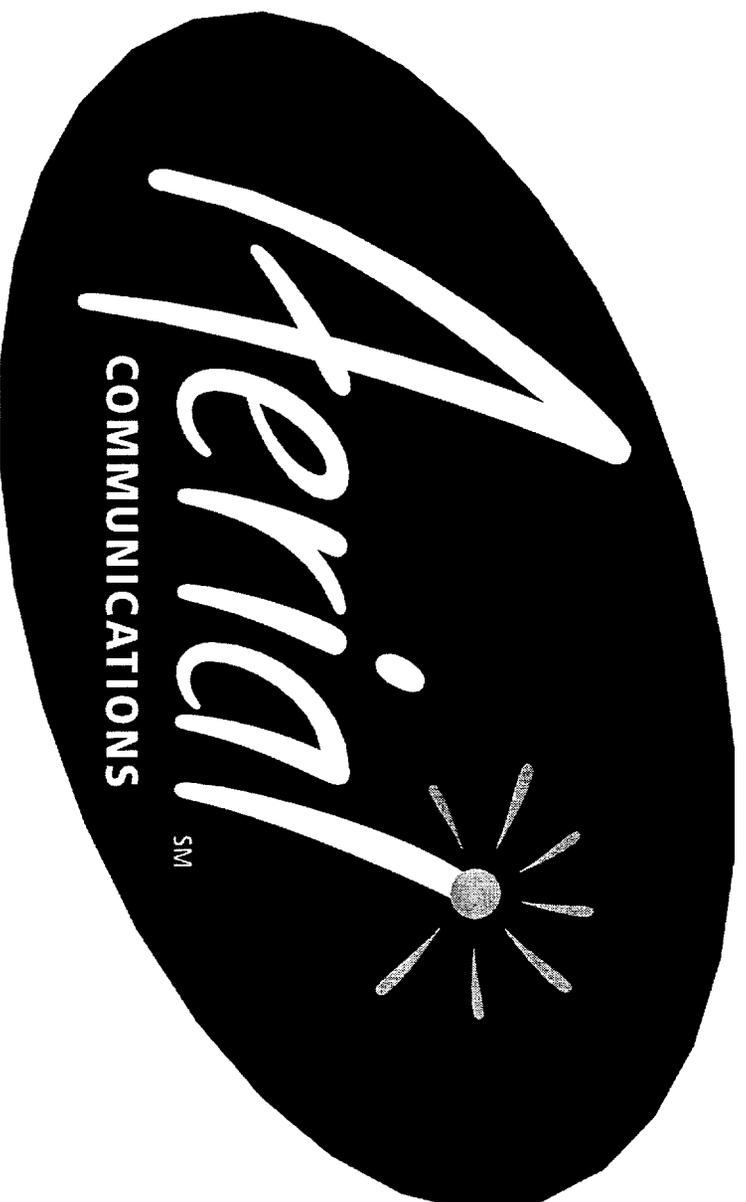
Very truly yours,



Brian T. O'Connor  
Vice President-Legislative and Regulatory Affairs  
VoiceStream Wireless

Enclosures

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***Aerial Communications Petition for  
Waiver Discussion with the FCC***

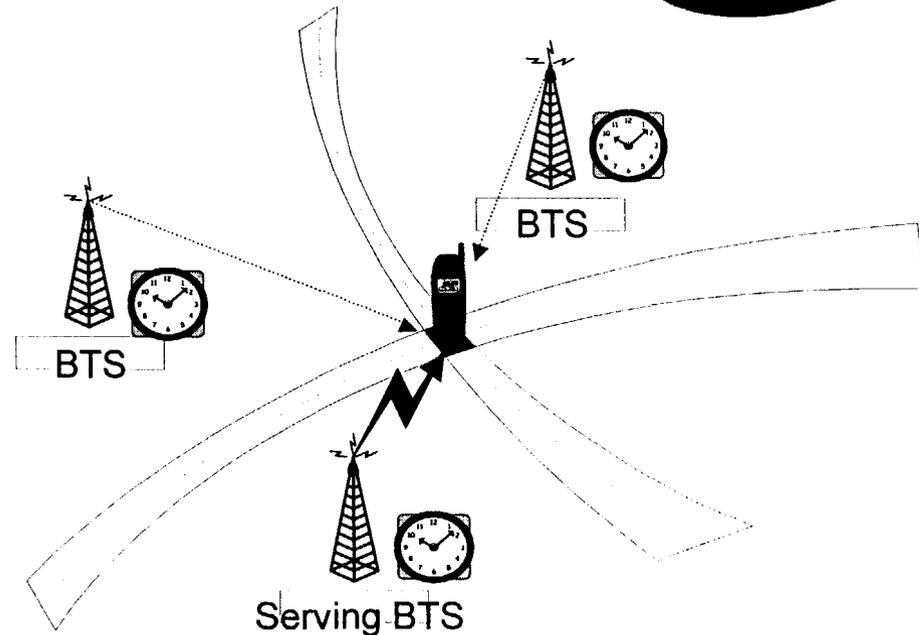
***May 2, 2000***

# E-OTD - Technical Description



## E-OTD Network Operation

- ◆ Mobile listens to bursts sent from neighboring BTSs
- ◆ Mobile records burst arrival times
- ◆ Position is triangulated from:
  - Coordinates of BTSs
  - Burst arrival time from each BTS
  - Timing differences between BTSs



3G Systems use E-OTD as the intrinsic method for position determination

## E-OTD - Handset Implementation



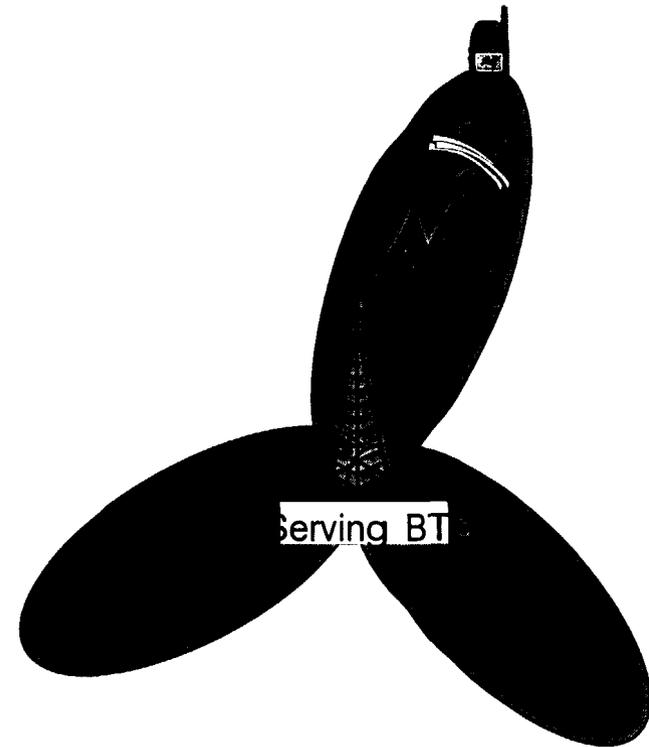
- ← No Change to Antenna Structure
- ← No Change to DSP or RF Hardware
- ← Software Modification Required to Enhance Existing Measurements Process

# ***Network Software Solution - Technical Description***



## ***Network Software Solution Operation***

- Solution uses data currently reported by the mobile and known by the BTS
- Works with all legacy mobiles
- Only Data from a single cell is necessary
- Variety of information used to calculate position
- Received signal strength from all sectors
- Known cell location and antenna orientation
- Basic timing advance
- Enhanced timing advance



# ***Aerial Proposal***



- ◆ Implement Network Software Solution
  - Immediate ALI support for all handsets everywhere.
  - Better than Phase I accuracy
  - ALI safety net for public safety
- ◆ Implement Handset Based E-OTD Technology
  - Can meet implementation timelines
  - Can do so with reasonable cost
  - Can meet 100m accuracy
- ◆ Achieve Increasing Accuracy on Both Technologies Over Time
  - Improvements will come with experience
  - Gains on one technology will benefit the other

# ***Aerial's Proposal Meets FCC's Goals***



## ◆ RAPID

- Network Software solution provides instant ALI support across entire network
- First E-OTD handsets are available for testing now
- No volume manufacturing issues for E-OTD Handsets

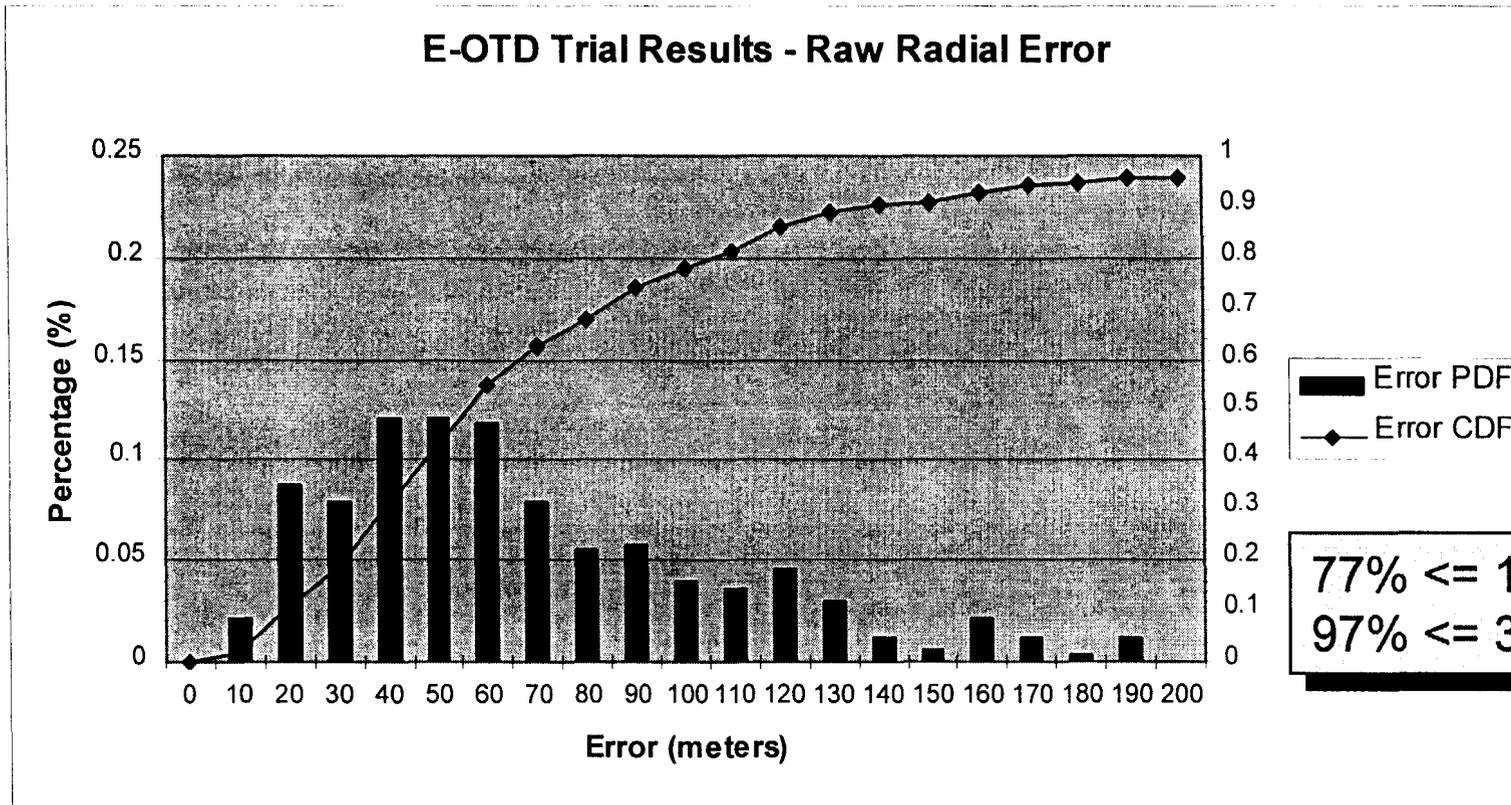
## ◆ INEXPENSIVE

- Network Software solution has a low, fixed cost
- Inexpensive implementation in the E-OTD handset
- Relatively inexpensive network equipment
- Consequently, relatively small cost to pass onto the public

## ◆ UBIQUITOUS

- Network Software solution will allow better than phase I accuracy for all calls everywhere
- Network Software solution will cover noncompliant handsets
- Rapid availability and low handset cost will allow E-OTD to quickly become ubiquitous
- PSAP request not required

# E-OTD Field Trial Results



E-OTD Raw Radial Error Results (meters) and Vector Accuracy is Available

# ***Future E-OTD Trials***



- ◆ Upcoming Aerial E-OTD Trial
  - 300 km<sup>2</sup> Suburban Area
  - Will complete end of year 2000
  - Wide industry participation
  - Seek to understand accuracy possibilities and limitations
  - Seek to understand how information from Network Software solution could be used to improve accuracy

# ***E-OTD - Future Enhancements to Accuracy***



- ◆ Learning curve effects with the technology will improve accuracy
- ◆ Increasing memory and processing capabilities in handsets will improve accuracy
- ◆ Increasing cell site density will improve accuracy
- ◆ Refined planning, implementation and manufacturing will improve accuracy
- ◆ Accuracy improvements will happen across all environments
- ◆ E-OTD will benefit from evolution to 3G networks where E-OTD technology is the preferred, standardized method for positioning

# ***Network Software Solution - Future Enhancements to Accuracy***



- ◆ Presence of E-OTD can be used to enhance the accuracy of the Network Software solution
  - Network software measurements can be combined with actual position reported by E-OTD mobiles to train the Network Software algorithms
  - Positioning accuracy of non-compliant handsets can be improved
  - This benefit is proportional to the number of E-OTD mobiles
- ◆ Increasing cell site density will improve accuracy

# ***Conclusions***



- ◆ Aerial's proposed solution provides:
  - Ubiquitous support for location information
  - Improving accuracy over time
  - Rapid deployment without a PSAP request
  - Relatively low cost



# ***Recommendations***

- ◆ Retain the October 1 2001 implementation deadline
- ◆ Implement a 2 year progression towards the 50m accuracy requirement for handset based solutions
  - Initial accuracy requirement 100m
  - Require a overlay solution like the network software solution to address non-compliant handsets
  - Deploy a full ALI solution without a PSAP request
- ◆ Grant the Aerial waiver so that investment and deployment of a full ALI Phase II solution can proceed.