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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

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MAY - 5 1997
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of	)	
	)	
Amendment of Part 90 of the Commission's Rules To Provide for the Use of the 220 MHz-222 MHz Band by the Private Land Mobile Radio Service	)	PR Docket No. 89-552
	)	
Implementation of Sections 3 (n) and 332 of the Communications Act	)	GN Docket No. 93-252
	)	
Regulatory Treatment of Mobile Services	)	
	)	
Implementation of Section 309 (j) of the Communications Act-- Competitive Bidding	)	PP Docket No. 93-253

To: The Commission

Petition For Reconsideration

INTEK Diversified Corp. ("INTEK")[1] by its counsel, pursuant to Section 1.429 of the Commission's Rules (47 C. F. R. § 1.429), hereby submits this Petition for Reconsideration of the Commission's *Third Report and Order* ("*Order*") in the above-captioned proceeding.[2] For the reasons stated below and as documented in the attached Appendices, INTEK urges the Commission to amend its rules to: (a) provide meaningful interference

[1]INTEK is the parent company of Securicor Radiocoms Limited ("Radiocoms") and Roamer One, Inc. ("Roamer One"). Both Radiocoms and Roamer One have participated extensively in this proceeding.

[2] 62 Federal Register 15978 (April 3, 1997).

protection between Phase I and Phase II co-channel licensees[3] in the 220-222 MHz band (the "220 MHz Band"); (b) provide Phase I licensees the operational and technical flexibility needed to respond to the demands of their customers and to solve ancillary technical problems (such as intermodulation problems) by permitting the modification of Phase I systems within the station's 28 dBuV/m service contour based on maximum allowable height and power limits; and (c) promote the meaningful implementation of its spectrum efficiency standard by placing requests for waiver or interpretation of that standard on public notice for comment by interested parties.

I. **Background**

Through its operating subsidiaries, INTEK has a wide range of expertise in every aspect of operations at 220 MHz. Roamer One is one of the leading operators and managers of 220 MHz land mobile radio systems and has extensive real world experience in the construction, operation and deployment of spectrally-efficient 220 MHz systems. Roamer One's day-to-day management responsibilities provides it with significant knowledge of the propagation characteristics of the 220 MHz band as well as the existing service requirements of the band. Radiocoms is a manufacturer and leading developer of the highly-spectral efficient Linear Modulation technology. Its existing 5 kHz LM systems represent state-of-the-art technology and are ideally suited for operation under the Commission's channelization plan for the 220 MHz band. Radiocoms' 5 kHz LM system can carry analog speech, digital "plain" or encrypted speech and text, maps, black and white or color pictures and slow scan video. Radiocoms has already equipped thousands of Phase I channels in the 220 MHz band with its 5 kHz LM

[3]As used herein, "Phase I" licensees shall refer to the licensees of existing constructed systems in the 220 MHz Band; "Phase II" licensees shall refer to licensees that obtain their licenses pursuant to the competitive bidding procedures adopted in the *Order*.

equipment.

INTEK commends the Commission for its leadership in promoting spectrum efficient technologies through the allocation of the 220 MHz band to narrowband 5 kHz technology. This decision has significantly enhanced the commercial options available to land mobile users in the United States. At the same time, it has provided for U. S. leadership in the deployment of advanced communications technologies and has created many new jobs in the country and enhanced economic productivity. As described below, however, certain aspects of the Commission's *Order* should be reconsidered and modified to enable both the Phase I and Phase II 220 MHz Band systems to most effectively serve the public. Most importantly, the Commission must adopt an adequate interference protection standard between Phase I and Phase II licensees based upon real world operational data.

II. The Commission Should Amend Its Proposed Interference Standards To Assure Adequate Protection To Phase I and Phase II 220 MHz Licensees.

In its *Order* (at para. 173), the FCC provided that the co-channel interference protection between Phase I and Phase II licensees would be based upon a minimum geographic separation of 120 km between Phase I and Phase II base stations. Alternatively, the FCC provided that a Phase II licensee could locate their base stations less than 120 km from a Phase I station by providing the co-channel Phase I licensee a minimum of 10 db protection to its 38 dbuV/m service contour (F(50,50)). In adopting these standards, the FCC dismissed the pleas of incumbent Phase I licensees for interference protection based upon the predicted 28 dbuV/m service, noting, for example, that the Commission employed the 40 dbuV/m service contour in defining the co-channel interference protection in the 800 MHz and 900 MHz SMR services.

In order to achieve the F (50/50) standard of quality service, the Commission "determined that a 220 MHz station should be protected from interference by the provision of 10dB protection to the station's 38 dBu contour."[4] This standard was universally opposed by the land mobile industry as insufficient to meet the Commission's established goal of quality service. Led by AMTA, the industry asked for a minimum interference standard in which a Phase II licensee would not be allowed to cause interference within a Phase I licensee's 28 dBu contour.

Based on the real-world operational data for Phase I 220 MHz systems that is now available, INTEK respectfully urges the FCC to reconsider the co-channel interference protection provided between Phase I and Phase II licensees and, on such reconsideration, to adopt the 28 dbuV/m service contour (F(50,50)) as the benchmark for determining the siting of co-channel Phase II facilities. To this end, as demonstrated in the attached Appendices A through D, data based on existing 220 MHz operations in the Los Angeles, California market indicates that reliable service *as defined by the FCC* (i.e., F(50,50)) on an operating 220 MHz Phase I system is available up to the system's 24 dbuV/m contour. In addition, as demonstrated on Appendix D use of the 38 dBu service contour as the interference standard will result in harmful interference between Phase I and Phase II licensees, a loss of existing service area for Phase I systems and resulting "dead spots" between Phase I and Phase II operations.

As a result of the harmful interference between co-channel systems, the effective operations of both Phase I and Phase II systems will be significantly inhibited, existing users will experience a reduction in service and the reliability of 220 MHz service generally will be threatened. In short, the interference protection standards between Phase I and Phase II

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[4] *Order*, at para. 177.

licensees adopted by the Commission are inadequate. If left unchanged, these standards will lead to harmful interference between Phase I and Phase II licensees, diminishing the potential use of the band and devaluing its worth in the marketplace. For these reasons and based on Roamer One's extensive real world operational experience and reflected in the attached engineering analysis, INTEK urges the Commission at a minimum to define a Phase I licensee's protected service area from Phase II operations to be the predicted 28 dBuV/m field with 10 db of protection.

III. Licensees Should Be Allowed To Make Height And Power Modifications In Servicing Their Own Service Areas

In its Order, the Commission ruled that Phase I licensees are prohibited from modifying existing authorizations to operate at a higher effective radiated power (ERP) or antenna height-above-average-terrain (HAAT) under any circumstances. [5] However, this is an unnecessary restriction on existing operators that has no public interest benefit. In order to encourage maximum operational flexibility and utilization of the band, the Commission should allow a licensee to make any modifications aimed at serving its own service area that does not impact other stations.

As shown above, the licensee's service area should be defined as the area protected from interference by the provision of 10dB protection to the station's 28 dBu contour. Thus, modifications which do not impact operations outside this contour should be allowed. Moreover, INTEK believes that in the 220 MHz band the public interest benefits will be greatest if this service area contour is based on the maximum allowable height and power authorized

[5] *Order,* at para. 174.

under the rules.

The Commission's decision to restrict modifications in the 220 MHz band is an abrupt and unnecessary departure from the clear policy goal to encourage operational flexibility. In this proceeding, the Commission originally proposed to allowed modifications to existing authorizations aimed at serving an existing service area.[6] Thus, a licensee would be allowed to relocate a base station or to add a "fill-in" station "within its existing service contour" so long as the transmissions from such stations did not exceed the benchmark interference level.

The current proposal preventing existing licensees from modifying their systems even though they will have no adverse impact on Phase II licensees serves no useful purpose[7]. Any land mobile licensee should be free to maintain full operational flexibility in providing service within its own service area as long as that service does not negatively impact other users of the spectrum. The Commission's restriction on modifications is not only inconsistent with its goal for operational flexibility in the 220 MHz proceeding, but it is inconsistent with actions taken in other land mobile services.

In a similar situation for 800 MHz SMR service, the Commission

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[6]*See Second Report and Order*, PR Docket No. 89-552, GN Docket No. 93-252, 11 FCC Rcd 3668 (1996). (*"220 MHz Second Report and Order."*)

[7]Reconsideration of the technical flexibility afforded Phase I licensees is further mandated by the FCC's processing of Phase I modifications pursuant to the *Second Report and Order* in this proceeding. In particular, in granting many relocation requests submitted pursuant to the *Second Report and Order*, contrary to the industry's understanding of the scope of permissible modifications, the FCC reduced the effective radiated power to that reflected on the original license grant at the station's original site. This processing, in essence, has resulted in a number of 220 MHz systems that are forced to operate at power levels inappropriate for their licensed transmitter site. This, in turn, has created technical difficulties for these operating stations which now require remedy.

permitted incumbent licensees to retain maximum operational flexibility. Thus, the Commission allowed these licensees to even "add new transmitters in their existing service area...to fill in "dead spots" in coverage or to reconfigure their systems to increase capacity within their service area so long as their 22 dBu interference contours are not expanded."[8] Indeed, the Commission chose to use the 22 dBu interference contour rather than the 40 dBu service contour because it would "give incumbents more operational flexibility without adversely impacting the EA licensee's ability to build a viable wide-area system in the same market."[9] Likewise, for 900 MHz systems, the Commission grandfathered secondary site applications in order to allow incumbent licensees to better serve their markets.[10]

In light of the Commission's policy goal to encourage maximum operational flexibility in the land mobile services, the Commission should allow similarly situated existing 220 MHz licensees to modify their systems.[11] In addition, consistent with the Commission's policy goal of increased flexibility, an incumbent's service area should be defined based on maximum authorized power and height levels. INTEK believes that the balance between

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[8]*First Report and Order, Eight Report and Order, and Second Further Notice of Proposed Rulemaking,* PR Docket No. 93-144, 11 FCC Rcd 1463, at para. 86 (1996).

[9]*First Report and Order, Eight Report and Order, and Second Further Notice of Proposed Rulemaking,* PR Docket No. 93-144, 11 FCC Rcd 1463, at para. 86 (1996); The Commission has even allowed "lower band" 800 MHz licensees that are currently subject to a licensing freeze to modify their systems where the modification did not expand the protected 40 dBu service contour of the original location. *Hawaiian Wireless Partners*, DA 96-2057, released December 9, 1996.

[10]*See Second Report On Reconsideration and Seventh Report And Order,* PR Docket No. 89-553, PP Docket No. 93-253, GN Docket No. 93-252, 11 FCC Rcd 2639 (1995), at para. 43.

[11]See *Melody Music, Inc. v. FCC,* 345 F.2d 730 (D.C. Cir. 1965).

existing Phase I and Phase II licensees is best accommodated through use of this standard. It will allow incumbents maximum flexibility, without unnecessarily impacting the future services of Phase II licensees who will be authorized to provide service over much larger geographic areas than the incumbents.

IV. The Commission Should Place All Requests For Waiver Of The Efficiency Standards On Public Notice For Comment By Interested Parties.

In its Order, the Commission acknowledged that one of its principle goals in the 220 MHz band was to encourage the development of spectrally-efficient technologies. To further this goal, aggregating contiguous 5 kHz channels will be permitted to introduce non-narrowband equipment into the 220 MHz Band provided that equipment satisfied the spectrum efficiency standard.[12] The Commission indicated, however, that it would allow manufacturers to submit for type acceptance equipment that does not meet the voice or data efficiency standard in the rules, as long as a technical analysis is submitted demonstrating that the equipment is more spectrally efficient than the standards. If the analysis is deemed satisfactory by the Commission's Equipment Authorization Division, the equipment will then be authorized. Any such waivers will be interpretive of the FCC's general policy of promoting the development and deployment of spectrally-efficient technologies.

In light of the underlying public interest goals in preserving the essential character of the 220 MHz Band as a test-bed for spectrally-efficient equipment, INTEK requests that the Commission place any request for waiver of the 5 kHz efficiency standard on public notice. With this procedure, all interested parties, including other equipment manufacturers will be given an opportunity to comment and inform the Commission of any concerns or recommendations

[12] *Order,* at para. 14.

regarding the waiver. This procedural safeguard is necessary to provide the Commission with valuable technical input on issues that could greatly impact the entire industry as well as the Commission's goal of maximizing spectrum efficiency in the 220 MHz band. A public notice and comment process, moreover, will ensure that the waiver decision is made on the basis of a full administartive record. In sum, the waiver process should not be allowed to eviscerate the Commission's carefully adopted spectrum efficiency standards now set forth in the rules.

IV. CONCLUSION

In view of the foregoing, the Commission should take action in this proceeding consistent with the views expressed herein.

Respectfully submitted,

INTEK DIVERSIFIED CORP.

By: _____
Robert B. Kelly

KELLY & POVICH, P.C.
1101 30th Street, N.W.
Suite 300
Washington, D.C. 20007
(202) 342-0460

Its Counsel

May 5, 1997

TECHNICAL SHOWING

Discussion of Technical Showing

The attached computer generated maps of the Los Angeles, Ca. area depict the predicted signal coverage obtained from a representative 220MHz – 222MHz base station repeater sited on Mount Lukens. As indicated by the notation in the footer of each map, the predicted coverage area varies as a function of the applied signal dBu V/m strength. The Mount Lukens site was chosen as representative because of extensive experience with its operation and coverage area as well as its geographic location serving uneven terrain, water, areas of significant temperature and pressure variances and urban areas with high noise floor levels.

The repeater atop Mr. Lukens is operating at 5108′ AMSL and at 15 watts ERP. The actual coverage areas wherein no less that 50% of the mobile units can access the control channel at least 50% of the time is known to us and our customers as that depicted by the 24 dBu V/m map. Moreover, a mobile unit can be demonstrated both in practical application and laboratory environments to operate quite satisfactorily in fringe areas receiving a signal strength of only 18 dBu V/m.

The maps also predict the area of interference that would result in the event a co-channel licensee is providing 10 dB of protection to 38 dBu V/m and 28 dBu V/m service contours. The banded area is that area wherein neither licensee will be able to provide service due to the signal strength from each transmitter and the receive sensitivity of the mobile. On both sides of this band will be continuing interference resulting in cross-talk situations and unreliable validations of data transmissions, yet some utility for voice communications will be relatively unhampered. As shown by the maps, both licensees suffer, albeit the Phase II licensee will be most severely impacted in loss of usable coverage area due to encroachment of the Phase I signal at levels high enough to cause substantial interference.

Methodology

The computer generated maps attached hereto were generated from a model calibrated to the actual coverage and signal strengths produced from a working site. Although the model does not specifically integrate the parameters of the Sec. 73.699 F(50,50) or F(50,10) field strength charts for channels 7-13 described in the Third Report and Order, care has been taken to closely emulate the effects of those specifications and that of the standard curves.

The working site is located at: N34=16-04, 5108′ AMSL, 2525′ HAAT, 15 watts ERP

Software: MicroPath 2000 using 3 arc second terrain data

Loss model: Longley-Rice/TIREM at 220.5MHz with variables of:

Cimate	1
Refractivity	320
Ground Mho	15
Ground Sigma	0.05
Irregularity	1000
Variability	2
Reliability	50%
Confidence	50%

Summary

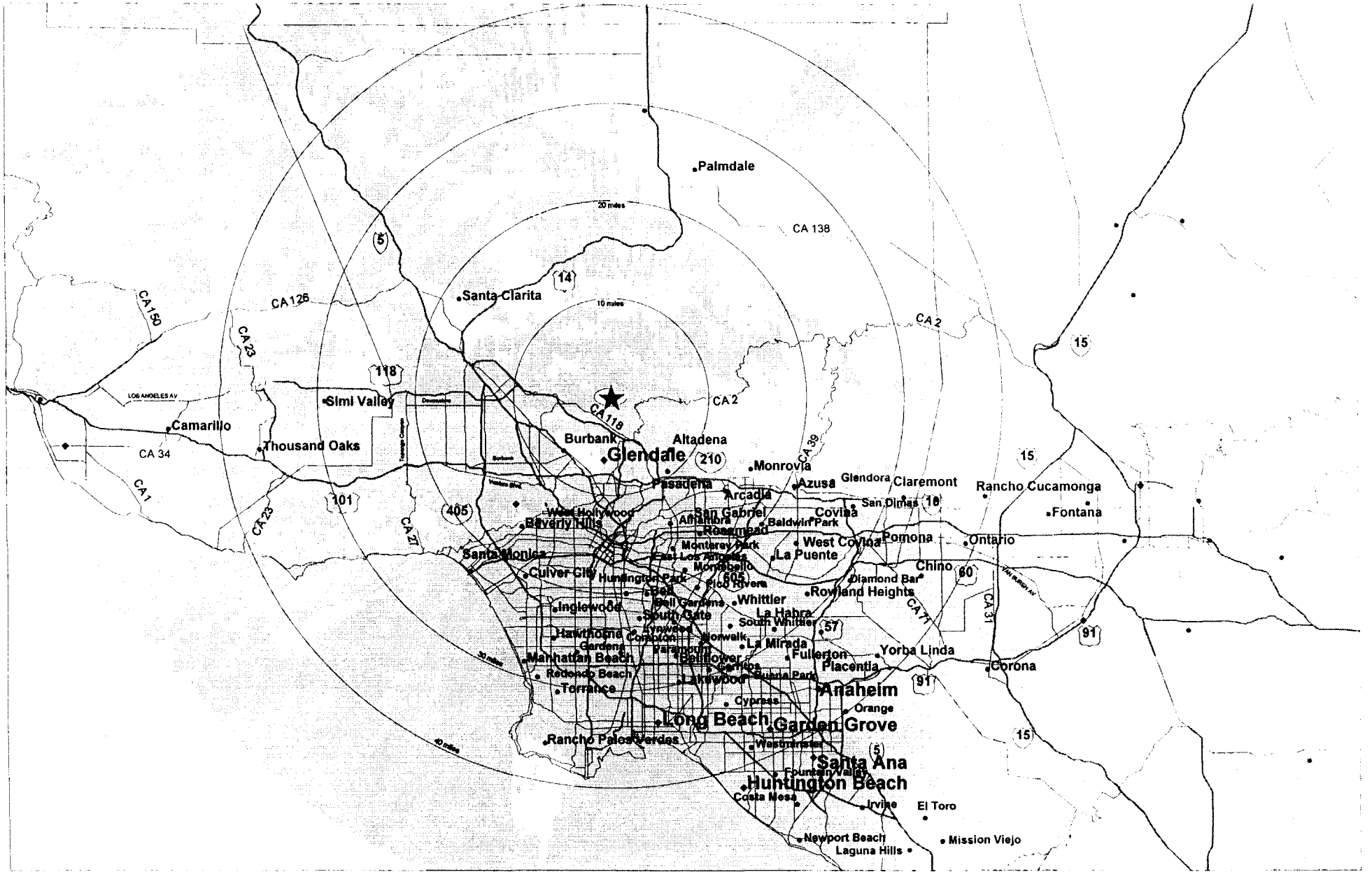
While the service contour established at 24 dBu V/m is the actual coverage area afforded current customers in the Los Angeles area, we recommend that the Commission implement protection to at least 28 dBu V/m as suggested by the attached propagation study maps.

As President of Roamer One, Inc. and Executive Vice President of Intek Diversified Corporation, I instructed and supervised qualified employees of Roamer One to complete this study. These personnel were assisted by qualified engineers employed by Intek's wholly owned subsidiary, Securicor Radiocoms Ltd., a manufacturer of narrowband 220MHz base station and mobile equipment.

I declare under penalty of perjury that the above is true and accurate.

Signed: _____, May 5, 1997
David Neibert

Appendix A



24dBuV/meter 220MHz coverage of Los Angeles, California vicinity experienced by RoameR One subscribers and staff from WPEQ215 Mt. Lukens site

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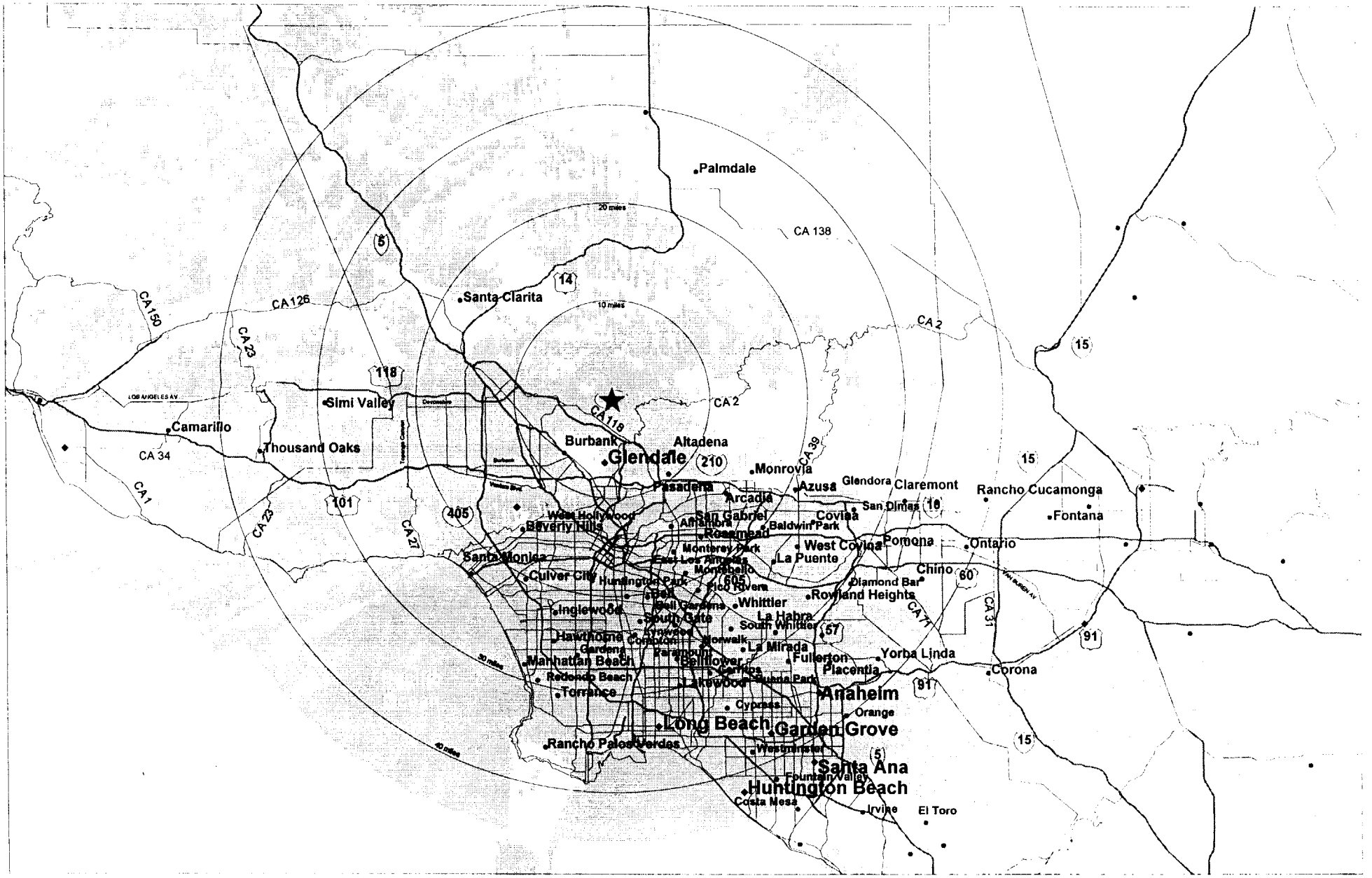
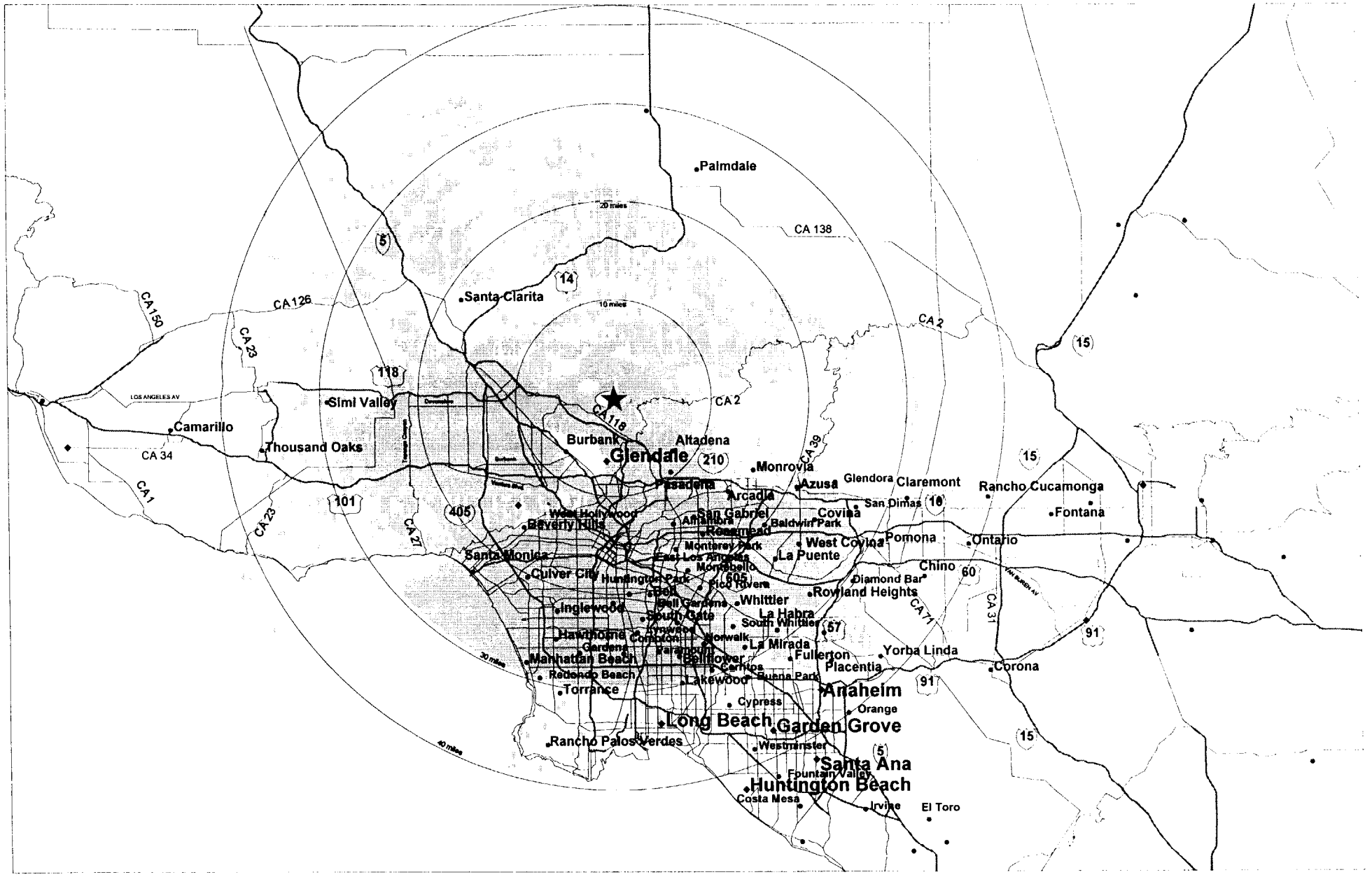
Appendix B



28dBuV/meter 220MHz coverage of Los Angeles, California vicinity from WPEQ215 Mt. Lukens base station site

lkns2838.wor 5/1/97

Appendix C



38dBuV/meter 220MHz coverage of Los Angeles, California vicinity from WPEQ215 Mt. Lukens base station site

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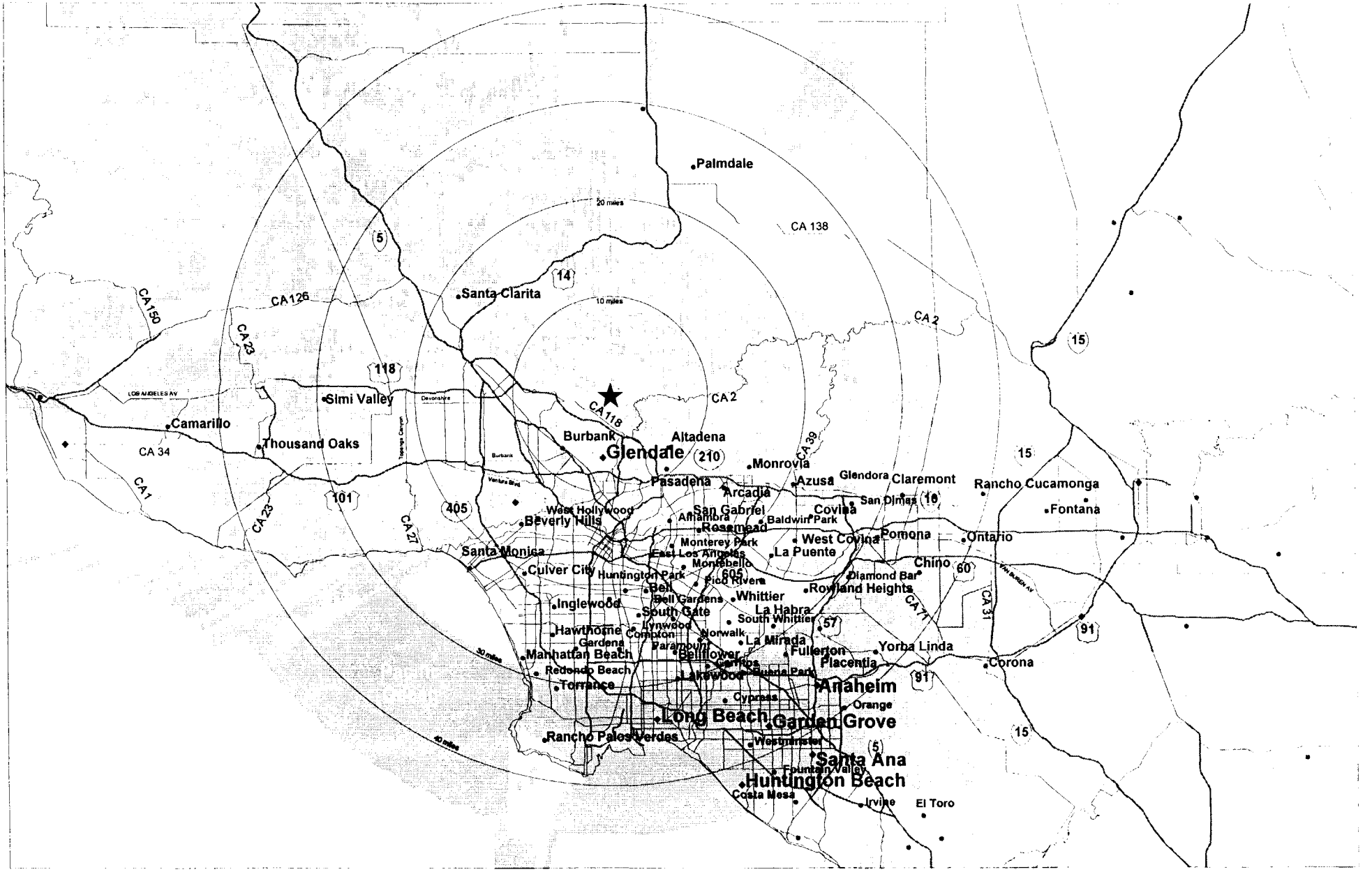
Appendix D



38 to 28dBuV/meter signal level area of Los Angeles that would be potentially unserved by 220MHz coverage from WPEQ215 Mt. Lukens base station site

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