

would obligate the Gulf of Mexico BTA holder “to correct at its expense any condition of electromagnetic interference caused to authorized MDS service . . .,” and the Commission has reserved the right under Section 21.939 to require any MDS conditional licensee or licensee “to (a) modify the station to use cross polarization, frequency offset techniques, directional antenna, antenna beam tilt, or (b) order an equivalent isotropically radiated power decrease, a reduction in transmitting antenna height, a change in antenna location, a change in antenna radiation pattern, or a reduction in aural signal power” when necessary to avoid interference. However, until the Commission can invoke its authority and mandate any necessary changes, wireless cable subscribers along the Gulf coast face the prospect of unpredictable interference from the Gulf of Mexico BTA.

More importantly, WCA believes that under PetroCom’s proposal, wireless cable systems along the Gulf coast might have to make substantial modifications that would reduce their ability to provide service to the 16.7 million people residing in Gulf coast BTAs, just to meet their interference protection obligations under the existing rules to a Gulf of Mexico BTA authorization holder. The wireless systems that WCA’s members and others are operating and developing have been designed to optimize coverage over land. Since those systems have been designed in an environment without a Gulf of Mexico BTA-like service area, they have been designed without regard to the potential for interference to a Gulf of Mexico BTA. Were the Commission to establish a Gulf of Mexico BTA-like service area and mandate that systems in BTAs bordering the Gulf of Mexico afford the level of interference protection contemplated by Section 21.938 of the Rules, MDS stations comprising the Gulf coast wireless cable systems

could be forced under Section 21.938 to incur substantial interference-elimination expenses and could be required under Section 21.939 of the Rules to make significant modifications to their stations (including use of directional antennas that reduce coverage, the use of exaggerated beam tilts that limit the radio horizon, decreases in power that reduce coverage and changes in antenna location to less favorable positions) that would substantially jeopardize their ability to provide wireless cable services over land.

This is particularly true given the unique propagation characteristics facing those operating near the Gulf. Because signals tend to relay far past the normal radio horizon, and do so in unpredictable fashion, many of the traditional interference-reduction techniques are of no utility. To avoid interference in this sort of environment, those operating wireless cable systems on land may be forced to take draconian measures to protect the use of MDS channels by the oil and gas industry in the Gulf of Mexico contemplated by the Petition from unpredictable interference — measures that will reduce coverage to the population centers along the Gulf coast. Thus, the burden of complying with Sections 21.938 and 21.939 is likely to be extremely heavy for those operating wireless cable systems in BTAs that adjoin the Gulf of Mexico. Given, as is discussed *infra*, that the demand for MDS/ITFS service in the Gulf of Mexico is at best speculative, the public interest is best served by not establishing a Gulf of Mexico BTA that would have the same rights as the holders of previously-auctioned Gulf coast BTAs, particularly at this late date.

Moreover, PetroCom's approach cannot be squared with the Commission's general philosophy that one must accept the interference situation as one finds it, and that interference

protection obligations to newcomers should not be imposed on previously proposed facilities. Unless the Commission makes clear that BTA authorization holders along the Gulf of Mexico will have no obligation to cure actual interference suffered by the Gulf of Mexico authorization holder, and that the Commission will not invoke its authority under Section 21.939 for the benefit of the Gulf of Mexico authorization holder, establishment of a Gulf of Mexico BTA-like service area will likely have serious adverse consequences for wireless systems all along the Gulf coast.^{39/}

C. The Auction System Proposed By PetroCom Is A Transparent Attempt To Minimize Competition For Any Gulf Of Mexico License.

Should the Commission choose to ignore the threat to land-based systems and the lack of any demonstrable demand for the use of MDS and ITFS spectrum to meet communications needs in the Gulf, it should reject the self-serving proposals advanced by PetroCom for the conducting of an auction. The motive behind PetroCom's proposals is clear – evidence has been presented to the Commission that PetroCom is illegally operating commercial facilities in the Gulf utilizing MDS channels,^{40/} and must secure the Gulf BTA authorization in order to

^{39/}Similarly, the Commission should address a problem that will be faced by MDS licensees proposing to modify their facilities. Under the rules, they must demonstrate that those modifications will not cause the power flux density to exceed -73 dBW/m² at the boundary of their protected service area. 47 C.F.R. § 21.902(b)(5)(i). The Commission should make clear that so long as the predicted signal meets that standard, assuming 4/3 earth curvature and normal propagation, the MDS licensee has no further obligation to the Gulf of Mexico BTA holder should the signal propagate further.

^{40/}See Renewed Motion for Cancellation of Rig Telephones *et al.* FCC File No. 50311-CM-P-97 (filed Aug. 13, 1999); Motion for Issuance of Show Cause Order of Rig Telephones *et al.* FCC File No. 50311-CM-P-97 (filed Aug. 13, 1999); and Motion to Compel Disclosure of Developmental Data of Rig Telephones *et al.* FCC File No. 50311-CM-P-97 (filed Aug. 13, 1999).

legitimize its business. If adopted, the auction rules proposed by PetroCom would minimize (if not eliminate) any competition that PetroCom would face from other bidders for permanent Gulf authorizations.

Specifically, WCA opposes three aspects of proposal: (1) setting aside one-half the spectrum in the Gulf for small businesses and only auctioning the small business allocation at this time; (2) precluding bidding for the Gulf MDS/ITFS authorizations by the Wireless Communications Service and Local Multipoint Distribution Service licensees for the Gulf; and (3) barring partitioning of the Gulf BTA-like area. While adoption of these proposals would no doubt advance PetroCom's interests, they would do nothing to advance the public interest. Each of these will be discussed in turn.

1. The Commission Should Not Set Aside One-Half the MDS/ITFS Spectrum for Small Businesses and Auction Only That License at this Time.

PetroCom urges the Commission to set aside one-half of the MDS/ITFS spectrum for businesses with annual revenues of less than \$25 million and total assets of less than \$75 million.^{41/} However, PetroCom provides not one public interest benefit to be achieved from limiting eligibility to such very small business entities; all it can say in support of its proposal is that "the Gulf MDS auction will more closely resemble the PCS auction than the land MDS auction [because the] Gulf spectrum is not encumbered by existing licensees."^{42/} That, however, is simply not true.

^{41/}See Amended Petition, at 6-7.

^{42/}*Id.* at 5.

In fact, the Gulf is heavily encumbered by existing licensees. As noted above, incumbent MDS and ITFS licensees have protected service areas extending as far as 35 miles into the Gulf and, even under the restrictive proposal advanced by PetroCom, land-based BTA authorization holders would have protected services areas extending several miles into the Gulf. These licensees may well provide wireless communications services to oil platforms and other locations within their protected service areas. Moreover, for the reasons set forth in Section II.B. above, these licensees will have a significant interest in securing all or part of a Gulf BTA in order to assure themselves of interference free service to land-based subscribers.

The Commission should consider that adoption of PetroCom's proposal would substantially preclude existing licensees along the Gulf coast – the very licensees who are best positioned to extend video, voice and data services over MDS and ITFS into the Gulf – from securing the right to serve outside their existing PSAs. Specifically, adoption of PetroCom's proposal would preclude Wireless One, Nucentrix, Wireless Holdings, Inc., Sprint, MCI, and BellSouth, all of whom own or are in the process of acquiring MDS/ITFS interests bordering the Gulf coast, from participating in the auction.

It is worth noting that the Commission has only once adopted a spectrum set aside. The Commission chose to reserve significantly less than half of the broadband PCS spectrum (the C and F blocks) for small businesses in 1994,^{43/} at a time when the Commission, by its own

^{43/}See *Implementation of Section 309(j) of the Communications Act -- Competitive Bidding*, 9 FCC Rcd 5532, 5585 (1994).

recognition, had little experience in developing rules to govern spectrum auctions.^{44/} Since then, the Commission's thinking on these issues has developed. The Commission, has recognized that liberal partitioning and disaggregation coupled with bidding credits, reduced upfront payments/downpayments and other such preferences, are a better way to increase opportunities for small businesses while speeding the rollout of new services to the public.^{45/} Thus, in its recent decisions adopting service rules for WCS, LMDS and 39 GHz, the Commission has declined to use set asides and has instead permitted licensees to freely partition licenses won at auction as a mechanism for promoting small business participation.^{46/} With this past experience

^{44/}*See FCC Report to Congress on Spectrum Auctions*, WT Docket No. 97-150, FCC 97-353, at 35 (rel. Oct. 9, 1997) (“The auction program has been evolutionary in nature. The Commission has gained valuable experience with each auction and continually uses this experience to improve the auction process. We expect to continue improving and refining our auction process as we conduct more auctions in the future.”).

^{45/}*See Geographic Partitioning and Spectrum Disaggregation By Commercial Mobile Radio Services Licensees and Implementation of Section 257 of the Communications Act: Elimination of Market Entry Barriers*, 11 FCC Rcd 21831, 21838 (1996). Similarly, the Commission's thinking on construction requirements has evolved from strict construction requirements in the initial auctions, to the use of “very flexible build-out requirements” for recent auctions of LMDS and WCS licenses. *Compare Implementation of Section 309(j) of the Communications Act - Competitive Bidding*, 9 FCC Rcd 2330, 2335 (1994), and *Broadband PCS MO&O at 5018-20, with Rulemaking To Amend Parts 1, 2, 21, and 25 Of The Commission's Rules to Redesignate The 27.5 - 29.5 GHz Frequency Band, To Reallocate the 29.5 - 30.0 GHz Frequency Band, To Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, Petitions for Reconsideration of the Denial of Applications for Waiver of the Commission's Common Carrier Point-to-Point Microwave Radio Service Rules, Suite 12 Group Petition for Pioneer Preference*, 12 FCC Rcd 12545, 12659 (1997) [hereinafter cited as “*LMDS Second Report and Order*”], and *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (“WCS”)*, 12 FCC Rcd 10785, 10843 (1997) [hereinafter cited as “*WCS Report and Order*”].

^{46/} *LMDS Second Report and Order*, 9 FCC Rcd at 12608; *WCS Report and Order*, 12 FCC Rcd at 10836-9; *Amendment of the Commission's Rules Regarding the 37.0 - 38.6 GHz and 38.6 - 40.0 GHz Bands, Implementation of Section 309(j) of the Communications Act -*

in mind, the Commission should decline to adopt PetroCom's set aside proposal and should instead look to the use of a liberal partitioning mechanism as a means of achieving the congressional mandate to "disseminat[e] licenses among a wide variety of applicants."^{47/}

2. WCS and LMDS Licensees Should Be Permitted to Bid for Any Gulf MDS/ITFS Authorization.

PetroCom's proposal to preclude the WCS licensee (Shell Offshore Services Company) and any future LMDS licensees^{48/} from bidding for the Gulf of Mexico BTA is equally devoid of merit.^{49/} While PetroCom claims, in cursory fashion, that excluding these licensees from participation will "fulfill Congress's mandate to promote competition and avoid excessive concentration of licenses,"^{50/} it provides absolutely no evidence that allowing one entity to control the MDS/ITFS authorizations and the WCS and/or LMDS licenses for the Gulf coast would deter competition or result in excessive concentration.^{51/} In its recent decisions with

Competitive Bidding, 37.0 and 38.6 - 40.0 GHz, 12 FCC Rcd 18600, 18626-7 (1997) [hereinafter cited as "39 GHz Report and Order"].

^{47/}47 U.S.C. § 309(j)(3)(B).

While WCA is strongly opposed to PetroCom's spectrum set aside proposal, WCA would not object to the use of preferences, such as tax certificates, bidding preferences or alternative payment schedules and methods of calculations, to encourage designated entity participation in any future auction of licenses in the Gulf.

^{48/}As PetroCom recognizes, the Gulf of Mexico is not designated as a service area for LMDS licensing. *See* Amended Petition, at 8 n. 18.

^{49/}*See* Amended Petition, at 7-8.

^{50/}*Id.* at 7.

^{51/}Indeed, it is curious that PetroCom has not proposed excluding the Gulf cellular licensees – which may well have market power in the Gulf – from eligibility. One can only conclude that here, too, PetroCom is acting in self-interest, rather than the public interest, since

regard to eligibility restrictions, the Commission has been guided by considerations of whether incumbents hold undue market power. Thus, incumbent cable operators and local exchange carriers were restricted from acquiring "in-region" A Block LMDS licenses at auction on the theory that a limited restriction would prevent incumbents from acquiring spectrum to protect their market power in the local telephony and multichannel video distribution markets from new competitors.^{52/} Since 39 GHz licenses were found unsuitable for supporting competition to lines of business where market power still exists, the Commission declined to adopt eligibility restrictions or spectrum caps in that service.^{53/} In short, PetroCom has provided no evidence that WCS and/or LMDS licensees for the Gulf of Mexico exercise market power such that the use of eligibility restrictions would be appropriate.

3. Partitioning of the Gulf BTA-like Area Should Be Permitted.

Finally, in yet another effort to minimize competition for any Gulf BTA-like service area created by the Commission, PetroCom proposes that partitioning of the area be banned. While PetroCom contends that partitioning should be banned because the population is low and customers only exist in small portions of the BTA,^{54/} that is of no import. For example, the Commission permits WCS licensees in the Gulf to partition their spectrum.^{55/} Similarly, when the Commission adopted service rules for the public coast service, which permits licensees to

it is affiliated with a Gulf cellular licensee.

^{52/}See *LMDS Second Report and Order*, 12 FCC Rcd at 12614-27.

^{53/}See *39 GHz Report and Order*, 12 FCC Rcd at 18626-7.

^{54/}See Amended Petition, at 9.

^{55/}See *WCS Report and Order*, 12 FCC Rcd at 10836-9.

provide maritime commercial mobile radio services (including within the Gulf of Mexico), regional licensees were permitted to freely partition and/or disaggregate licenses in part to mitigate the impact that competitive bidding would have upon small businesses.^{56/}

The Commission's willingness to permit partitioning of Gulf licensees is hardly surprising. The Commission has recognized that liberal partitioning "will provide licensees with the flexibility to use their spectrum more efficiently, will increase opportunities for small businesses and other entities to enter into the broadband market, and will speed service to underserved or unserved areas."^{57/} In particular, the Commission has recognized that permitting parties to partition licenses freely without regard to geopolitical boundaries may promote service to "smaller niche market[s]."^{58/} This ability to tailor service to one's needs is particularly valuable when as large a service area as the Gulf is being auctioned. As noted above, land-based MDS/ITFS service providers may well be interested in extending service into the Gulf beyond their existing protected service areas, but have no desire to serve the entire Gulf region. Allowing partitioning will permit those service providers to tailor their service area to their business plans. Barring partitioning, on the other hand, will likely preclude those service providers from participating in the auction.

^{56/}See *Amendment of the Commission's Rules Concerning Maritime Communications*, 12 FCC Rcd 16949, 16966 (1997) ("Providing licensees with the flexibility to partition their geographic service areas would create smaller areas that could be licensed to small businesses, including those entities which previously may not have had the resources to participate successfully in spectrum auctions.").

^{57/}See *CMRS Partitioning and Disaggregation Order*, 11 FCC Rcd at 21838-9.

^{58/}See *id.* at 21847.

III. CONCLUSION.

WHEREAS, for the reasons explained above, the WCA requests that the Commission deny the Amended Petition and take no further steps towards the licensing of MDS and ITFS facilities within the Gulf of Mexico at this time.

Respectfully submitted,

THE WIRELESS COMMUNICATIONS
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September 10, 1999

ATTACHMENT A

**Engineering Statement of George A. Harter In Support of Opposition to PetroCom's
Petition for Rulemaking**

Engineering Statement of George W. Harter In Support of Opposition to PetroCom's Petition for Rulemaking

Introduction

This engineering statement has been prepared in support of the Wireless Communications Association International, Inc.'s ("WCA's") Opposition to the Amended Petition for Rule Making submitted by PetroCom License Corporation ("PetroCom") for auctioning MDS and ITFS spectrum in the Gulf of Mexico. The proposals advanced by PetroCom would not adequately protect incumbent land-based stations in the Gulf Coast regions from harmful electrical interference.

Analysis

PetroCom's proposal to protect land-based licensees by observing a power flux density ("PFD") of -75 dBW/m^2 at the BTA boundary would result in harmful interference to land-based MDS and ITFS operations. Under Petrocom's proposal, transmitting stations in the Gulf could be located within approximately 10 geographical miles of the coastlines of Texas and Florida, and within 3 geographic miles of the coastlines of Alabama, Mississippi and Louisiana. Exhibit A provides an example that illustrates this point. This example considers the potential interference caused by a Gulf-based facility that complies with PetroCom's proposal and is 3 miles offshore from the BTA boundary (or a total of 6 miles offshore). In this case, a PFD of -75 dBW/m^2 is achieved at the BTA boundary with a transmission system utilizing an EIRP of 39.1 dBm. For purposes of this example, a transmit antenna height of 200' AMSL was used for the Gulf-based facility. This example assumes that the land-based transmission system is located 5 miles inland and operates with a typical EIRP of 56 dBm (20 watt transmitter, 16 dBi cardioid antenna aimed inland and 3 dB of line loss). Exhibit A shows that, under this example, all points with unobstructed electrical path to the land-based system's protected service area (PSA) will suffer significant interference (except for small areas within 2.8 miles of the land-based transmit site). It is worth noting that this study does not take into account possible increases in interference caused by ducting and superrefraction (which phenomena are explained below). Exhibit A also includes a radio shadow map depicting the area with unobstructed electrical path for the assumed height of 200' AMSL for the Gulf station. Further, if the height of the antenna were greater than 200', the unobstructed area would be even greater. For example, if the transmitter located in the Gulf were to transmit from an antenna height of 600', the entire PSA of the land-based system would be unobstructed and would suffer harmful interference.

PetroCom attempts to support its assertion that its proposed PFD limit would afford sufficient interference protection to land-based systems by providing a specific example in footnote 39 of a scenario where a Gulf based transmitter would comply with PetroCom's proposed PFD limit. PetroCom supplied no engineering analysis in support of its conclusion on non-interference under that scenario. In fact, an analysis using the

technical parameters proposed by PetroCom shows that such a facility would cause significant interference to operations on land. Exhibit B includes an interference analysis of PetroCom's scenario and graphically depicts the significant areas of interference that will result to the land-based system.

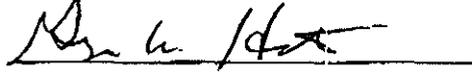
In addition, PetroCom failed to consider the adverse consequences of its proposal on the ability of land-based stations to convert to upstream use. In adopting Section 21.909(i) of the Commission's Rules, the Commission recognized that any increase in the noise floor of more than 1 dB would be unacceptable. Again, using the same assumptions for system configurations as specified by PetroCom in footnote 39 of its proposal (except that the land-based transmit location is now a response station hub), we can calculate the potential for interference to a hub. The noise floor in a 6 MHz bandwidth is assumed and is calculated to be -106 dBm. The received signal level of the Gulf station at the hub can be calculated to be -74 dBm. Therefore, the proposed Gulf station would cause an increase in the noise floor of approximately 32 dB, which could effectively preclude the land-based facility from utilizing its channels for upstream transmissions.

Other Issues with the PetroCom Proposal

- 1) PetroCom claims the issues of ducting and superrefraction are not more likely in the areas of large bodies of water. This statement is incorrect. Hardin & Associates, Inc. represents numerous MDS and ITFS clients throughout the United States and has been working in the wireless cable industry for over 15 years. Clients with systems operating in areas near the Gulf or other large bodies of water have had significantly more issues with ducting than inland systems.

Statement of Engineer

This engineering statement was prepared by George W. Harter, Chief Technical Officer of Hardin & Associates, Inc., a professional engineering firm licensed in the Commonwealth of Virginia and whose credentials are a matter of record with the Commission. The information contained herein was prepared by him or under his direction and it is true and correct to the best of his knowledge.



George W. Harter
HARDIN AND ASSOCIATES, INC.

Date: September 10, 1999

Exhibit A

Hardin & Associates, Inc.

Station Characteristics

Desired **100**

Undesired

Name: **TEST TRANSMITTER SITE**
 Service Area: **5 MILES INLAND FROM COASTLINE**

Test Gulf of Mexico Site
6 MILES FROM BTA BORDER
TEST

Cochannel Interference Analysis

Call Sign:
 Frequency (MHz): **2154.8 (MDS1)**
 Latitude: **30 : 25 : 21.43**
 Longitude: **88 : 45 : 1.43**
 Polarization: **V**
 Tx Power (dBm): **43.0**
 Line Loss (dB): **3.0**
 Tx Ant Gain (dBi): **16.0**
 Tx Ant Pattern: **HMD12VC**
 Tx Ant Orientation: **0.0**
 Tx Ant Height ('AGL): **400**
 Tx Site Elevation ('AMSL): **15**
 Electrical Beamtilt (+ assumes down tilt): **0.5**
 Mechanical Beamtilt, Orientation (+ assumes down tilt): **0.0**
 PSA Center
 Latitude: **30 : 25 : 21.43**
 Longitude: **88 : 45 : 1.43**

2154.8 (MDS1)
30 : 15 : 48.29
88 : 45 : 1.43
V
39.1
0.0
0.0
HMD12VO
0.0
200
0
0.5 Mech. Beam Tilt Orientation
0.0 Mech. Beam Tilt Orientation

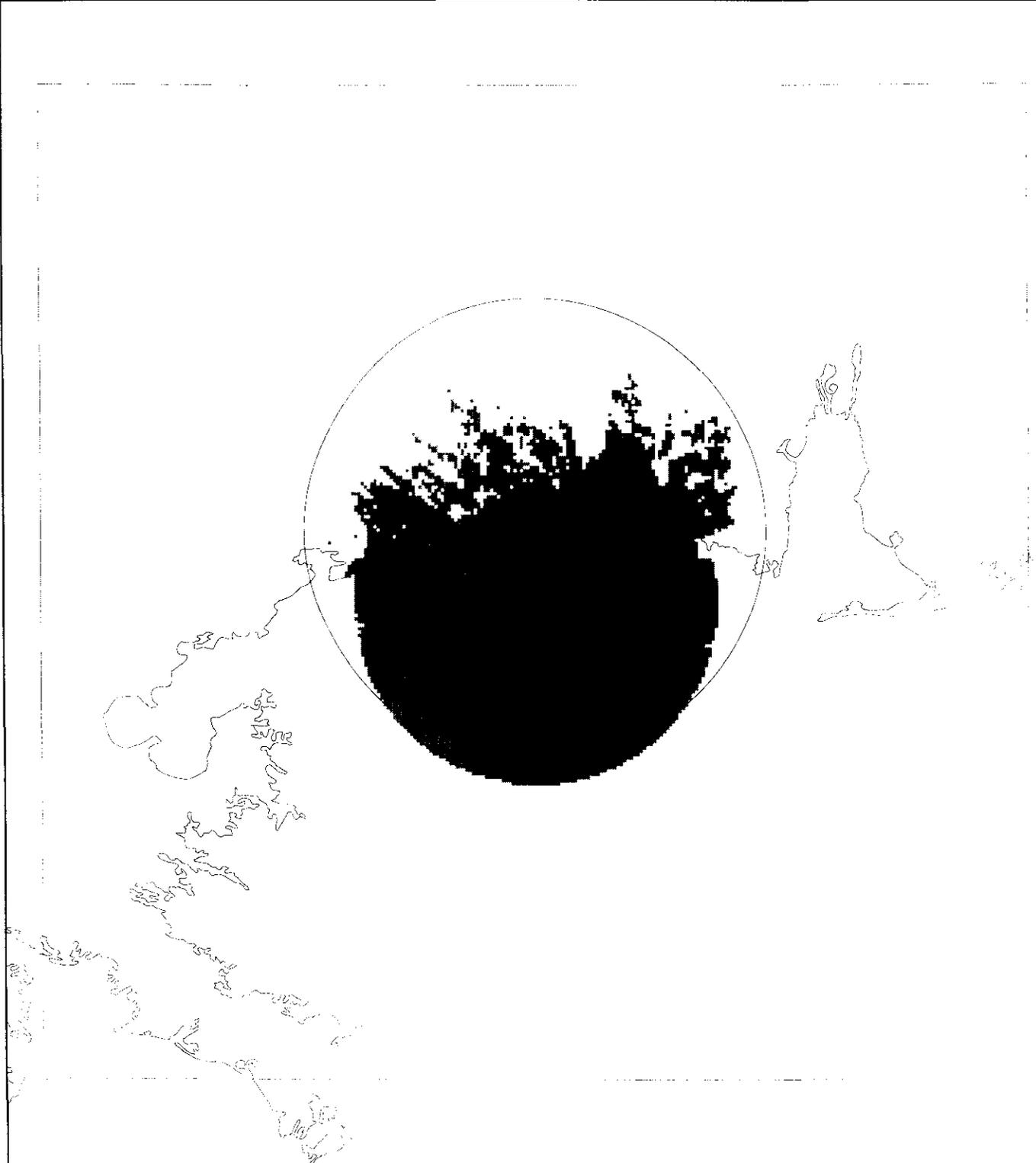
Interference Criterion: **45 dB**
 Cochannel calculations for the remaining channels in the group will not vary from the results shown below.

4/3 Earth radius Radio Horizons with 30' Rcv Ant
 Desired Station: **36.0 MI**
 Undesired Station: **27.7 MI**

Distance between stations: **11.0 MI**
 Bearing desired/undesired: **180.0 Deg**
RECEIVE ANTENNA = FCC
RECEIVE ANTENNA HEIGHT = 30 FT.

Boxed Numbers Denote a D/U below 45 dB.
 Boxed Numbers do not necessarily demonstrate interference.
 See attached shadow map and contour.

Bearing (Deg)	Distance from Desired (miles)																								
	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	26.6	28.0	29.4	30.8	32.2	33.6	35.0
0	35.4	30.3	27.6	25.9	24.7	23.7	23.0	22.4	21.9	21.5	21.2	20.8	20.6	20.3	20.1	19.9	19.8	19.6	19.5	19.3	19.2	19.1	19.0	18.9	18.8
10	39.4	34.3	30.4	27.9	26.7	24.7	24.0	22.9	22.4	22.0	21.7	20.9	20.6	20.3	20.1	20.0	19.8	19.6	19.5	19.4	19.2	19.1	19.0	18.9	18.9
20	51.6	46.5	41.8	38.0	34.8	31.9	29.6	27.5	27.0	25.6	25.3	23.7	23.4	23.2	22.3	22.1	21.9	21.8	20.6	20.5	20.4	20.3	20.2	19.6	19.5
30	51.7	46.5	43.8	42.0	40.8	39.8	39.1	36.5	34.0	33.6	31.3	29.0	28.7	27.0	26.8	25.1	24.9	23.8	23.6	23.5	23.4	22.0	21.9	21.8	21.7
40	53.4	47.4	43.9	41.9	40.6	39.6	38.9	38.3	37.8	37.4	37.1	36.8	34.5	34.3	32.1	29.9	29.7	27.6	27.5	25.8	25.7	25.6	24.1	24.0	23.9
50	55.4	49.0	45.2	42.7	40.6	39.2	38.4	37.8	37.3	36.9	36.6	36.3	36.0	35.8	35.6	35.5	35.3	33.2	33.0	30.9	28.8	28.7	28.7	26.6	26.5
60	55.0	49.6	46.7	43.9	41.8	40.1	38.6	37.5	36.7	36.3	36.0	35.7	35.5	35.3	35.1	34.9	34.8	34.6	34.5	34.4	34.3	32.2	32.2	30.1	30.0
70	54.1	48.6	45.6	43.7	42.3	40.3	38.8	37.5	36.5	35.6	34.8	34.5	34.3	34.1	33.9	33.7	33.6	33.5	33.4	33.3	33.2	33.1	33.1	33.0	30.9
80	53.0	47.3	44.3	42.3	40.9	39.9	39.1	37.2	36.0	35.1	34.3	33.5	32.8	32.6	32.5	32.4	32.2	32.1	32.0	32.0	31.9	31.8	31.8	31.7	31.7
90	49.6	45.8	42.6	40.5	39.1	38.0	37.2	36.6	35.1	34.3	33.2	32.5	31.8	31.1	30.7	30.6	30.5	30.4	30.4	30.3	30.2	30.2	30.2	30.1	30.1
100	47.4	41.4	40.0	37.8	36.2	35.1	34.3	33.7	33.2	31.9	31.1	30.1	29.5	28.8	28.2	27.9	27.8	27.8	27.7	27.7	27.6	27.6	27.6	27.6	27.6
110	45.8	39.2	35.1	34.7	33.1	31.9	31.0	30.4	29.9	29.6	28.4	27.7	26.8	26.2	25.4	24.8	24.8	24.8	24.8	24.8	24.7	24.7	24.7	24.7	24.7
120	44.5	36.9	32.2	29.1	29.3	27.9	27.0	26.4	26.0	25.7	25.5	24.4	23.3	22.8	22.0	21.5	21.2	21.3	21.3	21.3	21.3	21.3	21.4	21.4	21.4
130	42.7	35.1	29.8	25.7	23.7	23.6	22.6	21.9	21.5	21.3	21.2	20.2	19.4	18.5	18.0	17.3	17.4	17.5	17.5	17.6	17.7	17.7	17.8	17.8	17.9
140	41.0	33.2	27.7	23.3	19.3	17.4	18.2	17.5	16.0	15.9	15.9	15.0	13.9	13.3	12.7	12.6	12.8	12.9	13.0	13.2	13.3	13.4	13.5	13.6	11.6
150	39.1	31.4	25.8	20.9	16.5	12.2	10.5	11.7	11.5	11.6	11.9	10.5	9.6	8.9	9.3	9.5	9.8	10.0	10.2	10.4	10.5	8.7	6.8	4.9	5.0
160	40.3	33.1	28.2	23.3	18.3	13.2	8.3	9.3	9.4	10.0	8.8	8.0	8.1	8.7	9.1	9.5	9.9	8.2	6.6	4.9	3.1	1.8	0.4	0.6	-0.3
170	41.1	33.7	28.7	24.3	20.1	14.8	7.0	4.2	5.7	4.5	5.5	6.8	5.8	2.6	-0.3	-1.3	-1.8	-2.8	-3.1	-2.9	-3.6	-3.4	-3.2	-3.5	-3.3
180	41.3	33.9	28.8	24.3	19.7	14.4	6.4	-35.4	-18.3	-13.8	-11.3	-9.6	-8.5	-7.6	-6.8	-6.3	-5.8	-5.4	-5.0	-4.7	-4.5	-4.2	-4.0	-3.8	-3.7
190	41.1	33.7	28.7	24.3	20.1	14.8	7.0	4.2	5.7	4.5	5.5	6.8	5.8	2.6	-0.3	-1.3	-1.8	-2.8	-3.1	-2.9	-3.6	-3.4	-3.2	-3.5	-3.3
200	40.3	33.1	28.2	23.3	18.3	13.2	8.3	9.3	9.4	10.0	8.8	8.0	8.1	8.7	9.1	9.5	9.9	8.2	6.6	4.9	3.1	1.8	0.4	0.6	-0.3
210	39.1	31.4	25.8	20.9	16.5	12.2	10.5	11.7	11.5	11.6	11.9	10.5	9.6	8.9	9.3	9.5	9.8	10.0	10.2	10.4	10.5	8.7	6.8	4.9	5.0
220	41.0	33.2	27.7	23.3	19.3	17.4	18.2	17.5	16.0	15.9	15.9	15.0	13.9	13.3	12.7	12.6	12.8	12.9	13.0	13.2	13.3	13.4	13.5	13.6	11.6
230	42.7	35.1	29.8	25.7	23.7	23.6	22.6	21.9	21.5	21.3	21.2	20.2	19.4	18.5	18.0	17.3	17.4	17.5	17.5	17.6	17.7	17.7	17.8	17.8	17.9
240	44.5	36.9	32.2	29.1	29.3	27.9	27.0	26.4	26.0	25.7	25.5	24.4	23.3	22.8	22.0	21.5	21.2	21.3	21.3	21.3	21.3	21.3	21.4	21.4	21.4
250	45.8	39.2	35.1	34.7	33.1	31.9	31.0	30.4	29.9	29.6	28.4	27.7	26.8	26.2	25.4	24.8	24.8	24.8	24.8	24.8	24.7	24.7	24.7	24.7	24.7
260	47.4	41.4	40.0	37.8	36.2	35.1	34.3	33.7	33.2	31.9	31.1	30.1	29.5	28.8	28.2	27.9	27.8	27.8	27.7	27.7	27.6	27.6	27.6	27.6	27.6
270	49.6	45.8	42.6	40.5	39.1	38.0	37.2	36.6	35.1	34.3	33.2	32.5	31.8	31.1	30.7	30.6	30.5	30.4	30.4	30.3	30.2	30.2	30.2	30.1	30.1
280	53.0	47.3	44.3	42.3	40.9	39.9	39.1	37.2	36.0	35.1	34.3	33.5	32.8	32.6	32.5	32.4	32.2	32.1	32.0	32.0	31.9	31.8	31.8	31.7	31.7
290	54.1	48.6	45.6	43.7	42.3	40.3	38.8	37.5	36.5	35.6	34.8	34.5	34.3	34.1	33.9	33.7	33.6	33.5	33.4	33.3	33.2	33.1	33.1	33.0	30.9
300	55.0	49.6	46.7	43.9	41.8	40.1	38.6	37.5	36.7	36.3	36.0	35.7	35.5	35.3	35.1	34.9	34.8	34.6	34.5	34.4	34.3	32.2	32.2	30.1	30.0
310	55.4	49.0	45.2	42.7	40.6	39.2	38.4	37.8	37.3	36.9	36.6	36.3	36.0	35.8	35.6	35.5	35.3	33.2	33.0	30.9	28.8	28.7	28.7	26.6	26.5
320	53.4	47.4	43.9	41.9	40.6	39.6	38.9	38.3	37.8	37.4	37.1	36.8	34.5	34.3	32.1	29.9	29.7	27.6	27.5	25.8	25.7	25.6	24.1	24.0	23.9
330	51.7	46.5	43.8	42.0	40.8	39.8	39.1	36.5	34.0	33.6	31.3	29.0	28.7	27.0	26.8	25.1	24.9	23.8	23.6	23.5	23.4	22.0	21.9	21.8	21.7
340	51.6	46.5	41.8	38.0	34.8	31.9	29.6	27.5	27.0	25.6	25.3	23.7	23.4	23.2	22.3	22.1	21.9	21.8	20.6	20.5	20.4	20.3	20.2	19.6	19.5
350	39.4	34.3	30.4	27.9	26.7	24.7	24.0	22.9	22.4	22.0	21.7	20.9	20.6	20.3	20.1	20.0	19.8	19.6	19.5	19.4	19.2	19.1	19.0	18.9	18.9



SIGNAL™: 322_job.map

Prop. model: Free Space + RMD

Time: 50.0% Loc.: 50.0%

Prediction Confidence Margin: 0.0dB

Climate: Continental Temperate

Groundcover: none

Atmospheric Abs.: none

K Factor: 1.333

RX Antenna - Type: DA

Height: 30.0 ft AGL Gain: 17.80 dBd

Shadow map

■ line-of-sight areas

□ shadowed areas

Min. receiver threshold level: -106.0 dBmW

Site	Ant. Elev. (ft)	ERPd (dBW)	Ant. Type	Coordinates
test4*	200.0	19.70	Omni-V	N30°15'48.29"
group: 1	2600.0000	MHz		W88°45'01.43"

MILES



3 SEC SHADOW MAP

COASTLINE TEST 11 MILE SEP

9/10/99

Exhibit B

Hardin & Associates, Inc.

Station Characteristics

Desired **100**

Undesired

Name: **TEST TRANSMITTER SITE**
 Service Area: **10 MILES INLAND FROM COASTLINE**
 Call Sign:
 Frequency (MHz): **2154.8 (MDS1)**
 Latitude: **30 : 29 : 39.1**
 Longitude: **88 : 45 : 0.02**
 Polarization: **V**
 Tx Power (dBm): **50.0**
 Line Loss (dB): **4.0**
 Tx Ant Gain (dBi): **16.0**
 Tx Ant Pattern: **HMD12VO**
 Tx Ant Orientation: **0.0**
 Tx Ant Height ('AGL): **400**
 Tx Site Elevation ('AMSL): **0**
 Electrical Beamtilt (+ assumes down tilt) : **0.5**
 Mechanical Beamtilt, Orientation (+ assumes down tilt): **0.0**
 PSA Center
 Latitude: **30 : 29 : 39.1**
 Longitude: **88 : 45 : 0.02**

Test Gulf of Mexico Site
14 MILES FROM COAST
 TEST
 Frequency (MHz): **2154.8 (MDS1)**
 Latitude: **30 : 8 : 48.57**
 Longitude: **88 : 45 : 0.02**
 Polarization: **V**
 Tx Power (dBm): **42.2**
 Line Loss (dB): **0.0**
 Tx Ant Gain (dBi): **0.0**
 Tx Ant Pattern: **HMD12VO**
 Tx Ant Orientation: **0.0**
 Tx Ant Height ('AGL): **200**
 Tx Site Elevation ('AMSL): **0**
 Electrical Beamtilt (+ assumes down tilt) : **0.5**
 Mechanical Beamtilt, Orientation (+ assumes down tilt): **0.0**

Cochannel Interference Analysis

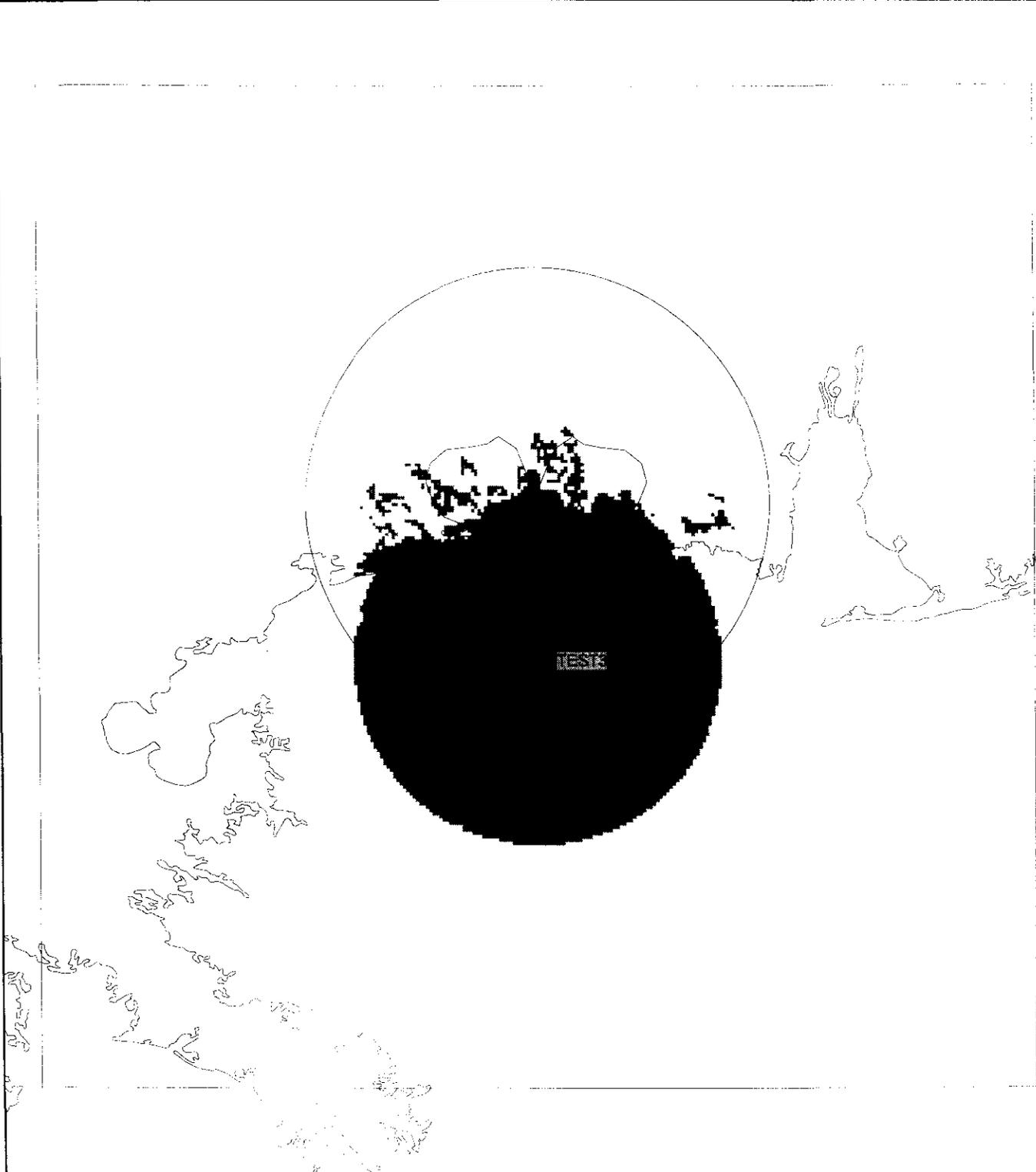
Interference Criterion: **45 dB**
 Cochannel calculations for the remaining channels in the group will not vary from the results shown below.

4/3 Earth radius Radio Horizons with 30' Rcv Ant
 Desired Station: **36.0 MI**
 Undesired Station: **27.7 MI**

Distance between stations: **24.0 MI**
 Bearing desired/undesired: **180.0 Deg**
RECEIVE ANTENNA = FCC
RECEIVE ANTENNA HEIGHT = 30 FT.

Boxed Numbers Denote a D/U below 45 dB.
 Boxed numbers do not necessarily demonstrate interference.
 See attached shadow map and contour.

Bearing (Deg)	Distance from Desired (miles)																								
	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	26.6	28.0	29.4	30.8	32.2	33.6	35.0
0	45.0	39.4	36.4	34.3	32.8	31.6	30.6	29.8	29.1	28.5	28.0	27.5	27.1	26.8	26.5	26.2	25.9	25.6	25.4	25.2	25.0	24.8	24.7	24.5	24.4
10	50.0	44.4	40.4	38.3	35.4	34.2	33.3	31.7	31.1	30.5	30.0	28.5	28.1	27.7	27.4	27.1	26.9	26.1	25.9	25.7	25.5	25.3	25.1	25.0	24.8
20	61.0	55.4	52.3	50.2	48.7	45.5	44.5	41.7	41.0	38.4	37.9	35.4	35.0	34.6	32.8	32.5	32.3	30.5	30.3	30.1	28.9	28.7	28.5	28.4	28.2
30	60.9	55.3	52.2	50.1	48.5	47.3	46.3	45.5	44.8	44.2	43.7	43.2	42.8	42.5	42.2	41.9	41.6	39.3	39.1	36.9	36.7	36.5	34.4	34.2	34.1
40	63.4	57.3	53.6	51.0	49.1	47.4	46.1	45.3	44.6	44.0	43.5	43.0	42.6	42.2	41.9	41.6	41.4	41.1	40.9	40.7	40.5	40.3	40.1	40.0	39.9
50	64.8	59.1	56.0	52.8	50.9	49.2	47.9	46.5	45.6	44.5	43.7	43.0	42.3	41.9	41.6	41.3	41.0	40.8	40.6	40.4	40.2	40.0	39.8	39.7	39.6
60	64.8	59.0	55.8	53.6	51.9	50.6	49.6	47.7	47.0	45.9	45.1	44.1	43.4	42.8	42.2	41.7	41.1	40.6	40.2	40.0	39.8	39.6	39.5	39.3	39.2
70	64.7	58.9	55.6	53.3	51.6	50.3	49.2	48.3	47.6	46.9	46.4	45.9	44.4	43.6	43.0	42.4	41.9	41.2	40.7	40.2	39.8	39.4	39.2	38.8	38.7
80	64.6	58.7	55.3	53.0	51.3	49.9	48.8	47.8	47.1	46.4	45.8	45.3	44.9	44.5	44.2	42.8	42.6	41.8	41.4	40.9	40.5	40.1	39.4	39.0	38.9
90	62.5	56.5	55.1	52.7	50.9	49.4	48.3	47.3	46.5	45.8	45.2	44.7	44.2	43.8	43.5	43.2	42.9	42.6	41.4	41.2	40.8	40.1	39.8	39.4	39.0
100	62.4	56.4	52.8	50.3	48.5	48.9	47.7	46.7	45.8	45.1	44.4	43.9	43.4	43.0	42.6	42.3	42.1	41.8	41.6	41.4	41.2	40.1	40.0	39.4	39.0
110	63.3	56.8	52.6	50.0	48.0	46.4	45.1	44.0	45.0	44.2	43.6	43.0	42.5	42.0	41.7	41.3	41.1	40.8	40.6	40.4	40.3	40.2	40.0	38.9	38.8
120	64.9	58.1	53.9	50.7	48.1	45.8	44.4	43.2	42.2	41.3	42.6	41.9	41.4	40.9	40.5	40.2	39.9	39.6	39.4	39.3	39.1	39.0	38.9	38.9	38.8
130	66.2	59.5	55.2	52.0	49.3	46.8	44.7	42.8	41.2	40.2	39.4	38.6	40.0	39.5	39.1	38.7	38.4	38.2	38.0	37.9	37.8	37.7	37.6	37.6	37.6
140	67.7	61.0	56.6	53.3	50.5	47.9	45.8	43.7	41.8	39.9	38.0	37.1	36.4	35.8	37.3	36.9	36.6	36.4	36.2	36.1	36.0	36.0	36.0	36.0	36.1
150	69.1	62.3	58.1	54.7	51.9	49.3	47.0	44.8	42.7	40.6	38.7	36.6	34.8	33.6	33.0	32.5	34.2	34.0	33.9	33.8	33.9	34.0	34.1	34.2	33.4
160	69.0	62.5	58.4	55.4	52.8	50.6	48.5	46.3	44.0	41.8	39.3	37.0	34.6	32.2	29.8	29.1	30.7	30.6	30.6	30.8	31.1	31.4	30.8	30.1	29.7
170	69.0	62.4	58.3	55.2	52.6	50.3	48.2	46.2	44.3	42.3	40.4	38.4	35.6	32.2	28.6	24.6	22.7	24.8	25.5	26.5	25.3	24.9	25.3	26.0	26.6
180	69.0	62.4	58.3	55.2	52.5	50.2	48.1	46.0	44.0	41.9	39.8	37.5	34.9	31.9	27.9	21.9	3.4	-6.8	-0.4	2.9	5.1	6.7	7.9	8.9	9.8
190	69.0	62.4	58.3	55.2	52.6	50.3	48.2	46.2	44.3	42.3	40.4	38.4	35.6	32.2	28.6	24.6	22.7	24.8	25.5	26.5	25.3	24.9	25.3	26.0	26.6
200	69.0	62.5	58.4	55.4	52.8	50.6	48.5	46.3	44.0	41.8	39.3	37.0	34.6	32.2	29.8	29.1	30.7	30.6	30.6	30.8	31.1	31.4	30.8	30.1	29.7
210	69.1	62.3	58.1	54.7	51.9	49.3	47.0	44.8	42.7	40.6	38.7	36.6	34.8	33.6	33.0	32.5	34.2	34.0	33.9	33.8	33.9	34.0	34.1	34.2	33.4
220	67.7	61.0	56.6	53.3	50.5	47.9	45.8	43.7	41.8	39.9	38.0	37.1	36.4	35.8	37.3	36.9	36.6	36.4	36.2	36.1	36.0	36.0	36.0	36.0	36.1
230	66.2	59.5	55.2	52.0	49.3	46.8	44.7	42.8	41.2	40.2	39.4	38.6	40.0	39.5	39.1	38.7	38.4	38.2	38.0	37.9	37.8	37.7	37.6	37.6	37.6
240	64.9	58.1	53.9	50.7	48.1	45.8	44.4	43.2	42.2	41.3	42.6	41.9	41.4	40.9	40.5	40.2	39.9	39.6	39.4	39.3	39.1	39.0	38.9	38.9	38.8
250	63.3	56.8	52.6	50.0	48.0	46.4	45.1	44.0	45.0	44.2	43.6	43.0	42.5	42.0	41.7	41.3	41.1	40.8	40.6	40.4	40.3	40.2	40.0	38.9	38.8
260	62.4	56.4	52.8	50.3	48.5	48.9	47.7	46.7	45.8	45.1	44.4	43.9	43.4	43.0	42.6	42.3	42.1	41.8	41.6	41.4	41.2	40.1	40.0	39.4	39.0
270	62.5	56.5	55.1	52.7	50.9	49.4	48.3	47.3	46.5	45.8	45.2	44.7	44.2	43.8	43.5	43.2	42.9	42.6	41.4	41.2	40.8	40.1	39.8	39.4	39.0
280	64.6	58.7	55.3	53.0	51.3	49.9	48.8	47.8	47.1	46.4	45.8	45.3	44.9	44.5	44.2	42.8	42.6	41.8	41.4	40.9	40.5	40.1	39.4	39.0	38.9
290	64.7	58.9	55.6	53.3	51.6	50.3	49.2	48.3	47.6	46.9	46.4	45.9	44.4	43.6	43.0	42.4	41.9	41.2	40.7	40.2	39.8	39.4	39.2	38.8	38.7
300	64.8	59.0	55.8	53.6	51.9	50.6	49.6	47.7	47.0	45.9	45.1	44.1	43.4	42.8	42.2	41.7	41.1	40.6	40.2	40.0	39.8	39.6	39.5	39.3	39.2
310	64.8	59.1	56.0	52.8	50.9	49.2	47.9	46.5	45.6	44.5	43.7	43.0	42.3	41.9	41.6	41.3	41.0	40.8	40.6	40.4	40.2	40.0	39.8	39.7	39.6
320	63.4	57.3	53.6	51.0	49.1	47.4	46.1	45.3	44.6	44.0	43.5	43.0	42.6	42.2	41.9	41.6	41.4	41.1	40.9	40.7	40.5	40.3	40.1	40.0	39.9
330	60.9	55.3	52.2	50.1	48.5	47.3	46.3	45.5	44.8	44.2	43.7	43.2	42.8	42.5	42.2	41.9	41.6	39.3	39.1	36.9	36.7	36.5	34.4	34.2	34.1
340	61.0	55.4	52.3	50.2	48.7	45.5	44.5	41.7	41.0	38.4	37.9	35.4	35.0	34.6	32.8	32.5	32.3	30.5	30.3	30.1	28.9	28.7	28.5	28.4	28.2
350	50.0	44.4	40.4	38.3	35.4	34.2	33.3	31.7	31.1	30.5	30.0	28.5	28.1	27.7	27.4	27.1	26.9	26.1	25.9	25.7	25.5	25.3	25.1	25.0	24.8



SIGNAL™: 322_job.map

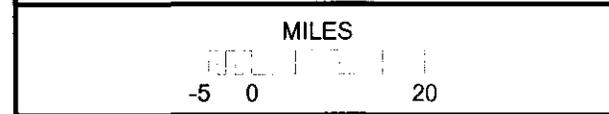
Prop. model: Free Space + RMD
 Time: 50.0% Loc.: 50.0%
 Prediction Confidence Margin: 0.0dB
 Climate: Continental Temperate
 Groundcover: none
 Atmospheric Abs.: none
 K Factor: 1.333
 RX Antenna - Type: DA
 Height: 30.0 ft AGL Gain: 17.80 dBd

Shadow map

■ line-of-sight areas
 □ shadowed areas

Min. receiver threshold level: -106.0 dBmW

Site	Ant. Elev. AMSL (ft)	ERPd (dBW)/Orient.	Ant. Type	Coordinates
TEST3	200.0	19.70	Omni-V	N30°08'48.57"
group: 1		2600.0000 MHz		W88°45'00.02"



3 SEC SHADOW MAP
 COASTLINE TEST 24 MILE SEP

9/10/99

CERTIFICATE OF SERVICE

I, Stephanie Sieber, hereby certify that the foregoing Opposition to Petition for Rule Making was served this 10th day of September 1999 by depositing a true copy thereof with the United States Postal Service, first-class postage prepaid, addressed to the following:

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A handwritten signature in black ink, appearing to read "S. Sieber", written over a horizontal line.

Stephanie Sieber

*Via Hand Delivery