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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service	)))	MM Docket No. 87-268

SUPPLEMENT TO PETITION FOR RECONSIDERATION OF
COMMUNITY TELEVISION OF SOUTHERN CALIFORNIA

Community Television of Southern California, licensee of noncommercial educational television Station KCET-TV, Channel *28, Los Angeles ("KCET"), hereby supplements its Petition for Reconsideration of the Commission's Sixth Report and Order in MM Docket No. 87-268, FCC 97-115 (released April 21, 1997) ("Sixth Report"), filed June 13, 1997.

The Sixth Report assigned a DTV Channel to KCET -- Channel *59 -- that is outside the "core" of channels that ultimately will be reserved for DTV use. KCET's Petition for Reconsideration argued that, as a noncommercial nonprofit organization largely dependent on individual and corporate contributions, KCET would be hard-pressed to construct the two DTV stations that would be required as a consequence of the Commission's assigning it an out-of-core DTV channel. KCET urged the Commission, in considering proposals which KCET understood would be filed by the Broadcasters Caucus and others, to address various problems with the Commission's proposed allocations in southern California, to change KCET's DTV channel, if possible, to a channel inside the core.

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In addition, KCET requested that the Commission give it a reasonable period of time after release of OET Bulletin No. 69 to explore the feasibility of obtaining a channel within the core. That Bulletin provided the coverage and interference criteria used by the Commission in developing the DTV Table of Allotments adopted in the Sixth Report and without it, it was not possible for KCET to determine whether an in-core DTV channel could be allocated. This Supplement is submitted pursuant to an Order of the FCC dated July 2, 1997 (DA 97-1377), authorizing submission of supplemental presentations by petitioners, like KCET, which requested modification of the Sixth Report's DTV allotments.

ARGUMENT

After reviewing OET Bulletin No. 69, KCET's consulting engineers, Hammett & Edison, have identified an in-core DTV channel -- Channel *45 -- on which KCET could operate in substantial compliance with applicable FCC DTV technical requirements. Channel 45 essentially complies with the FCC's allotment rules for DTV channels with respect to existing NTSC stations and proposed DTV allotments, although it is short-spaced to a vacant NTSC allocation in Tijuana, Mexico. Since the short-spacing to the Mexican allocation appears to be of a magnitude comparable to other Commission DTV allotments implicating Mexican spacing issues, KCET urges the Commission to institute, in consultation with the State Department,

negotiations with the Mexican authorities to permit KCET to operate on DTV Channel 45. Upon successful completion of those negotiations, KCET requests, for the reasons set forth in this Supplement, in its Petition for Reconsideration, and the Petition for Reconsideration and Clarification filed by Association of America's Public Television Stations and Public Broadcasting Service, that the FCC modify the DTV Table of Allotments to substitute DTV Channel 45 for DTV Channel 59 as KCET's DTV assignment. That action will not only address KCET's concerns about being allotted a channel outside the core -- concerns that could affect its ability to serve after the end of the transition -- but would also free up DTV Channel 59 for use in Los Angeles by another station. An Engineering Statement by Hammett & Edison in support of this request is attached as Appendix A. ("Engineering Statement").

As shown in the attached Engineering Statement, KCET could operate on Channel 45 from its current transmitter site at the Los Angeles Mount Wilson antenna farm, and provide the same service as it would using DTV Channel 59. Thus, both allotments would afford KCET the same replication of its current service area. Moreover, operation on DTV Channel 45 would cause substantially less interference to other stations than would operation on DTV Channel 59.

DTV Channel 45 would be short- or long-spaced to three NTSC or DTV channel assignments. (Engineering Statement at 2-3.) That nevertheless would represent an improvement over presently-proposed DTV Channel 59, which would be short- or

long-spaced to four NTSC or DTV channel assignments. In fact, operation on Channel 45 would result in far fewer persons receiving interference from KCET (47,122) than would receive interference from KCET if it were to operate on DTV Channel 59 as proposed by the Commission (133,815 persons). And, as shown in the Engineering Statement, no station affected by KCET's operation on Channel 45 would receive as much interference, either in terms of the number of persons subject to interference or percentage of service area, as would the stations affected by KCET's operation on DTV Channel 59.

Further, the number of persons in KCET's service area who would receive interference from other stations would be virtually eliminated if KCET were to operate on DTV Channel 45. Operating on DTV Channel 59, 37,004 persons within KCET's service area would receive interference from other stations, while only 40 persons would receive interference if KCET were to operate on DTV Channel 45. In short, even apart from the in-core versus out-of-core issues implicated by KCET's request, DTV Channel 45 would represent a significant improvement over DTV Channel 59 for KCET and the viewing public in Los Angeles and surrounding communities.

Based on the mileage separation requirements established in the Memorandum of Understanding between the U.S. and Mexico dealing with DTV allotments ("MOU")[1], one of the channels to

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[1] Memorandum of Understanding Between the Federal Communications Commission and the Secretaria de Comunicaciones y Transportes of the United Mexican States Related to the Use of the 54-72 MHz, 76-88 MHz and 470-806 MHz Bands for the Digital

[Footnote continued on next page]

which KCET would be short-spaced if it were to operate on DTV Channel 45 is NTSC Channel 45 in Tijuana, Mexico. Channel 45 in Tijuana is a vacant allotment which has been in the Table of Assignments at least since 1982. In addition to the Channel 45 allotment, Tijuana has at least two operating VHF television stations and four more vacant UHF allotments. (Engineering Statement at 3-4.)

In light of the difficulties inherent in identifying alternative in-core DTV channels in the congested Los Angeles/ Southern California area, the fact that Tijuana Channel 45 has been vacant for at least fifteen years, and the fact that the City of Tijuana has numerous additional vacant allotments, KCET requests the Commission to accommodate its request for re-assignment of Channel 45 by negotiating (in consultation with the State Department) with the Mexican government either to secure (a) the deletion of the Channel 45 allotment from Tijuana; (b) the substitution of another allotment in Tijuana for Channel 45; or (c) the waiver of the channel separation requirements of the MOU as between Los Angeles and Tijuana Channels 45. Such action would facilitate the ability of KCET to transition to digital television by eliminating the necessity for KCET to construct two digital television stations, something

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[Footnote continued from previous page]
Television Broadcasting Service Along the Common Border dated April 2, 1987, released by the FCC on April 21, 1997 (Report No. IN 97-11)

which, as it and others have argued at length, will strain its financial resources.[2]

While KCET does not know the precise status of the U.S. negotiations with the Mexican authorities concerning the allocation of DTV channels in the U.S., such negotiations have taken place throughout this proceeding. The Sixth Report apparently included DTV assignments requiring negotiated solutions with the Mexican authorities, as is reflected in the MOU. The Commission stated in the Sixth Report:

> We also note that some of the channels specified in the draft table are not fully compliant with the existing U.S.-Mexican and U.S.-Canadian agreements. We are continuing to work with these administrations to finalize the status of DTV allotments in border areas.[3]

Earlier in this proceeding the Commission stated:

> We have initiated coordination activities with both the Canadian and Mexican governments for proposed ATV allotments in the border areas. We expect to address coordination arrangements with these governments for ATV allotments in the border areas in a time frame consistent with our allotment and assignment schedule.[4]

In view of the Commission's apparent success in achieving accommodations for some of its proposed DTV allotments, as reflected in the MOU, KCET is hopeful that the U.S. would be equally successful in negotiating an arrangement with the Mexican authorities that would permit the assignment of DTV

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[2] See Petition for Reconsideration and Clarification of Association of America's Public Television Stations and Public Broadcasting Service, at 6-10.

[3] Sixth Report at note 368.

[4] Second Further Notice of Proposed Rulemaking in MM Docket 87-268, released August 12, 1992 (FCC 92-332) at ¶49.

Channel 45 to KCET. While the MOU establishes the technical criteria (including mileage separation standards) by which DTV assignments are to be made along the U.S.-Mexican border, the MOU is apparently only an interim set of understandings for implementation of DTV channel assignments in the U.S. Issues implicated by television channel assignments generally along the U.S.-Mexican border are still governed by an overarching agreement between the U.S. and Mexican governments which calls for cooperation on both sides in order to accomplish efficiency in the assignment of television channels. The current U.S.-Mexico Agreement[5] contemplates changes to the technical criteria established in the U.S.-Mexico Agreement through a simple notification consent procedure in order to accomplish "a more satisfactory technical arrangement of...facilities".[6] The two countries also have specifically committed to "...cooperate with each other for the purpose of minimizing interference and obtaining maximum efficiency in the use of television channels."[7]

KCET understands that the U.S.-Mexico Agreement is scheduled to be renegotiated early in 1998 to take account of issues arising from assignment of DTV channels in the U.S. and, ultimately, in Mexico. Such a renegotiation would appear to

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5 Agreement Relating to Assignments and Usage of Television Broadcasting Channels in the Frequency Range 470-806 MHz (Channels 14-69) Along the United States-Mexico Border, dated June 18, 1982 ("U.S.-Mexico Agreement").

6 U.S.-Mexico Agreement at §H.2.

7 Id. at §K.

afford the U.S. an opportunity to secure the necessary Mexican consents to the assignment of DTV Channel 45 to KCET, as well as of other proposed DTV allotments that are short-spaced to Mexican channels.

In fact, it appears that other DTV allotments made in this proceeding already have benefited from imposition of relatively relaxed U.S.-Mexico spacing requirements. For example, while the FCC's domestic spacing requirements for second, third, fourth and eighth adjacent channels is 96.6 kilometers, the MOU spacing requirements for U.S.-Mexico assignments are only 32 kilometers. This reduced spacing requirement permitted the FCC to have made DTV allotments for Channels 25 and 55 in San Diego, for example, that would have violated comparable domestic spacing requirements to a magnitude that is roughly double that proposed by KCET for Channel 45. The MOU's co-channel Mexico spacing requirement of 244 kilometers, which KCET would violate operating on Channel 45, is severe relative to the far lesser requirements to which the San Diego allotments are subject; for this reason, KCET's proposal could present a compelling case for a specially negotiated solution with Mexico. (See Engineering Statement at 3-6.)

Finally, grant of this proposal would free up DTV Channel 59 in Los Angeles, which could be utilized to help alleviate DTV allotment problems in that market that have been identified in this proceeding by the Broadcasters Caucus.

For all of these reasons, those set forth in its Petition for Reconsideration, and those set forth in the Petition for

Reconsideration and Clarification filed by the Association of America's Public Television Stations and the Public Broadcast Service, KCET respectfully requests the Commission to take all necessary steps to modify the DTV Table of Allotments and assign DTV Channel *45 rather than DTV Channel *59 to KCET, subject to securing any necessary consent by the Mexican government.

Respectfully submitted,

Marcia Cranberg

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Date: August 22, 1997

ATTACHMENT "A"

TV Station KCET
NTSC Channel 28
Los Angeles, California

Engineering Exhibit in Support of Supplemental Comments to Petition for Reconsideration

August 21, 1997

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HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

TV Station KCET • NTSC Channel 28 • Los Angeles, California

Statement of Dane E. Ericksen, Consulting Engineer

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Community Television of Southern California, licensee of non-commercial educational TV Station KCET, NTSC Channel 28, Los Angeles, California, to prepare an engineering exhibit in support of supplemental comments to the KCET June 13, 1997, Petition for Reconsideration to the Sixth Report and Order to MM Docket 87-268 ("DTV Table of Allotments").

DTV Channel 45 Could Be Substituted for DTV Channel 59

In the Sixth Report and Order ("Sixth R&O") the Commission assigned KCET DTV Channel 59, with an effective radiated power of 182 kW (DA) at an assumed effective height of 927 meters. This DTV channel would be outside the "core" DTV channels, regardless of whether the core channels remain as Channels 2–46 or end up being modified to Channels 7–51. Since stations receiving out-of-core DTV assignments are faced with the prospect of having to change their DTV channel at the end of the transition period, a search was made to see if an alternative core DTV channel might be available for KCET.

It is my conclusion that DTV Channel 45 could be substituted for DTV Channel 59, with a net reduction in interference. The Sixth R&O assigned DTV ERP of 182 kW, the FCC-generated replication pattern for KCET, and the existing KCET NTSC location and height were assumed for both the D59 and D45 interference and coverage calculations that follow.

DTV Channel 59 Allocation and Interference Conditions

The currently allocated DTV Channel 59 at the Mt. Wilson KCET NTSC site, at 34° 13' 26" N, 118° 03' 44" W, has short or long spacings to four stations and to one allocation, as follows:

Call	Channel	Location	Short/Long*	Distance	Required
KDOC-TV	N56	Anaheim, CA	Long	33.6 km	<24.1 km
KSTV-TV	N57	Ventura, CA	Short	89.3	96.6
Alloc.	N59	Big Bear Lake, CA	Short	104.0	244.6
KRCA	N62	Riverside, CA	Long	33.8	<24.1
KADY-TV	N63	Oxnard, CA	Short	89.3	96.6

* On certain channels, DTV spacings should be either *shorter* than a certain distance or *longer* than a certain distance; that is, spacing requirements are preclusion "doughnuts" rather than preclusion circles. Where the short-spacing is closer to violating the inner "hole" distance rather than the outer distance, we refer to the short-spacing as being too "long."

TV Station KCET • NTSC Channel 28 • Los Angeles, California

Using the Longley-Rice algorithm and cell-based interference calculating method spelled out in the Sixth R&O and in OET Bulletin No. 69, and as shown by the attached Figure 1, the following interference is predicted to those stations:

Station	New Interference Population (% Grade B)	Area (% Grade B)
KDOC-TV, N56, Anaheim	2,249 persons	4.0 sq. km
KSTV-TV, N57, Ventura	96,209	24.0
KRCA, N62, Riverside	35,357	16.0
KADY-TV, N63, Oxnard	none	none

DTV Channel 45 Allocation Conditions

Allocation conditions for DTV Channel 45, again at the KCET Mt. Wilson NTSC site, would be as follows:

Call	Channel	Location	Short/Long	Distance	Required
KZKI	N30	San Bernardino, CA	Long	33.7 km	<24.1 km
KVMD	N31	Twenty Nine Palms, CA		172.1	>96.6
Alloc.	N37	Puerto Penasco, SO, MX		532.1	32
Alloc.	N38	Santa Barbara, CA		152.0	>96.6
Alloc.	N41	Ridgecrest, CA		159.2	>96.6
KESQ-TV	N42	Palm Springs, CA		152.9	>96.6
KGMC	N43	Clovis, CA		300.9	>96.6
KHIZ	D44	Barstow, CA	Short	83.2	>88.5
KRPA	N44	Rancho Palos Verdes, CA		100.6	>88.5
KUZZ-TV	N45	Bakersfield, CA	Short	148.4	>244.6
Alloc.	N45	Tijuana, BC, MX	Short	211.0	244
Alloc.	N45	North Las Vegas, NV		346.9	>244.6
KUTP	N45	Phoenix, AZ		563.1	>244.6
KHSC-TV	N46	Ontario, CA		0.5	<9.7
KMIR	D46	Palm Springs, CA		155.6	>88.5
KJEO	N47	Fresno, CA		339.1	>96.6
Alloc.	N48	Mexicali, BC, MX		297.9	88
Alloc.	N49	Tecate, BC, MX		226.5	32
KVEA	N52	Corona, CA		0.04	<24.1
KAIL	N53	Fresno, CA		339.6	>96.6

DTV Channel 45 Interference Conditions

In the event DTV Channel 45 is substituted for DTV Channel 59, there would be three domestic short or long-spaced stations, KZKI, N30, San Bernardino, California; KHIZ, D44, Barstow, California; and KUZZ-TV, N45, Bakersfield, California, as shown by the attached Figure 2. Using

the Longley-Rice algorithm and cell-based interference calculating method spelled out in the Sixth R&O and in OET Bulletin No. 69, the following new interference would be caused to those stations:

Station	New Interference	
	Population (% Grade B)	Area (% Grade B)
KZKI, N30, San Bernardino	47,122 persons (0.35%)	24 sq. km (0.10%)
KHIZ, D44, Barstow	none	96 sq. km (0.64%)
KUZZ-TV, N45, Bakersfield	none	none

The percentages in parentheses indicate the portion of the station's NTSC Grade B coverage or DTV coverage that the interference population and areas represent. All are less than 1%, thus meeting the "*de minimus*" criteria tentatively adopted by the Commission staff.

Interference from other NTSC and DTV stations to the KCET DTV channel would also improve. As shown by the attached Figure 3, for the currently assigned DTV Channel 59, interference is predicted from three stations, as follows:

Station	Existing Interference	
	Population	Area
KLCS, N58, Los Angeles	none	4 sq. km
KMSG-TV, N59, Sanger	none	none
KCBS, D60, Los Angeles	37,004 persons	40 sq. km

As shown by the attached Figure 3, if KCET instead receives DTV Channel 45, the predicted interference it would receive would be as follows:

Station	Proposed Interference	
	Population	Area
KRPA, N44, Rancho Palos Verdes	none	none
KUZZ-TV, N45, Bakersfield	none	16 sq. km
KHSC-TV, N46, Ontario	40 persons	12 sq. km
KHIZ, D44, Barstow	none	none
KMIR, D46, Palm Springs	none	none

Thus, using the FCC DTV protocols, substitution of DTV Channel 45 for DTV Channel 59 would reduce the interference caused by other stations to the KCET DTV operations from 37,004 persons to 40 persons, and the worst-case interference area would be reduced from 44 sq. km to 28 sq. km.

Short-Spacing to Vacant Allocation at Tijuana, Mexico

It is noted that there would be a short-spacing to a vacant allocation for NTSC Channel 45 at Tijuana, Baja California, Mexico. However, Tijuana currently has two operating TV stations (XETV, N6, and XEWT-TV, N12) and no fewer than five vacant UHF allotments. It is therefore respectfully requested either that a specially-negotiated short-spacing agreement be obtained or

that the Mexican government be requested to delete this long-vacant allotment, dating from at least June 1982.†

It is further noted that the April 2, 1997, Memorandum of Understanding ("MOU") between the Secretaria de Communicaciones y Transportes, Government of Mexico, and the Federal Communications Commission, in several cases adopted markedly less rigorous DTV-to-NTSC spacing requirements for protection of Mexican NTSC TV stations and allotments, as follows:

Channel Separation	U.S. Requirement	MOU Requirement
Co-Channel	>244.6 km	>244 km
±1 Channel	9.7< prohibited d <88.5 km	10 < prohibited d <88 km
±2 Channels	24.1< prohibited d <96.6	24 < prohibited d <32
±3 Channels	24.1< prohibited d <96.6	24 < prohibited d <32
±4 Channels	24.1< prohibited d <96.6	24 < prohibited d <32
±7 Channels	24.1< prohibited d <96.6	24 < prohibited d <96
±8 Channels	24.1< prohibited d <96.6	24 < prohibited d <32
±14 Channels	24.1< prohibited d <96.6	24 < prohibited d <95
±15 Channels	24.1< prohibited d <96.6	24 < prohibited d <96

Because the spacing requirement for ±2, ±3, ±4 and ±8 channels is more than 60 km less restrictive to Mexican NTSC TV stations than required for U.S. NTSC TV stations, DTV Channel 25 assigned to San Diego, and approximately 40 km from the Tijuana N21, N27, and N33 vacant allotments, is not short-spaced under the MOU spacing requirements, but would be approximately 47 km short-spaced‡ under the U.S. domestic DTV-to-NTSC spacing requirements.

Similarly, DTV Channel 55 assigned to San Diego, and again approximately 40 km from the Tijuana N57 vacant allotment, is not short-spaced under the MOU spacing requirements, but would be approximately 47 km short-spaced under the U.S. domestic DTV-to-NTSC spacing requirements.

It is unclear whether the much less rigorous spacing requirements for ±2, ±3, ±4, and ±8 channels shown in the MOU are inadvertent or intentional, but, if inadvertent and if the MOU was only intended as an interim agreement, and if the final DTV agreement will reflect spacing requirements more consistent with U.S. DTV-to-NTSC spacing requirements, then the two San Diego DTV allotments will, in effect, represent "specially-negotiated" short-spaced allocations with short

† June 18, 1982, Agreement Between the United States of America and Mexico ("Agreement Relating to Assignments and Usage of Television Broadcasting Channels in the Frequency Range 470–806 MHz (Channels 14–69) Along the United States-Mexico Border").

‡ It is noted that the reference coordinates for the vacant Tijuana UHF allocations shown in the FCC data base are different, by several kilometers, than those shown in Appendix I to the MOU; further, the FCC data base shows identical reference coordinates (32° 31' 50" N, 117° 01' 46" W) for all five of the vacant Tijuana UHF allotments, whereas the MOU shows the same reference coordinates for only two of the five Tijuana UHF allotments.

spacings approximately twice as severe as the approximately 33-km short-spacing proposed between D45 at Los Angeles and N45 at Tijuana.

Summary

Substitution of DTV Channel 45 for DTV Channel 59 would provide non-commercial educational TV Station KCET a "core" DTV channel, thus eliminating the expense associated with changing frequency to a core DTV channel at the end of the transition period. Substitution of D45 for D59 would decrease the number of short-spaced stations or allocations from five to four, would either cause no interference or *de minimus* interference to the three domestic stations that would then become short-spaced, and would dramatically reduce the predicted interference that KCET would receive. Finally, substitution of D45 for D59 would free up Channel 59 for use by others.

List of Figures

In carrying out these engineering studies, the following attached figures were prepared under my direct supervision:

1. Map showing interference to others for KCET on D59
2. Map showing interference to others for KCET on D45
3. Map showing interference conditions to KCET for DTV Channel 59
4. Map showing interference conditions to KCET for DTV Channel 45
5. DTV.IXSTUDY™ analysis methodology.

Dane E. Ericksen, P.E.

August 21, 1997

REGISTERED PROFESSIONAL ENGINEER
DANE E. ERICKSEN
No. 11654
Exp. 9-30-00
ELECTRICAL
STATE OF CALIFORNIA

Affidavit

State of California
County of Sonoma | ss:

Dane E. Ericksen, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-11654, which expires on September 30, 2000, and is employed by the firm of Hammett & Edison, Inc., Consulting Engineers, with offices located near the city of San Francisco, California,

2. That he graduated from California State University, Chico, in 1970, with a Bachelor of Science Degree in Electrical Engineering, was an employee of the Field Operations Bureau of the Federal Communications Commission from 1970 to 1982, with specialization in the areas of FM and television broadcast stations and cable television systems, and has been associated with the firm of Hammett & Edison, Inc., since October 1982,

3. That the firm of Hammett & Edison, Inc., Consulting Engineers, has been retained Community Television of Southern California, licensee of non-commercial educational TV Station KCET, NTSC Channel 28, Los Angeles, California, to prepare an engineering exhibit in support of supplemental comments to the KCET June 13, 1997, Petition for Reconsideration to the Sixth Report and Order to MM Docket 87-268 ("DTV Table of Allotments"),

4. That such engineering work has been carried out by him or under his direction and that the results thereof are attached hereto and form a part of this affidavit, and

5. That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge except such statements made therein on information and belief and, as to such statements, he believes them to be true.

Dane E. Ericksen, P.E.

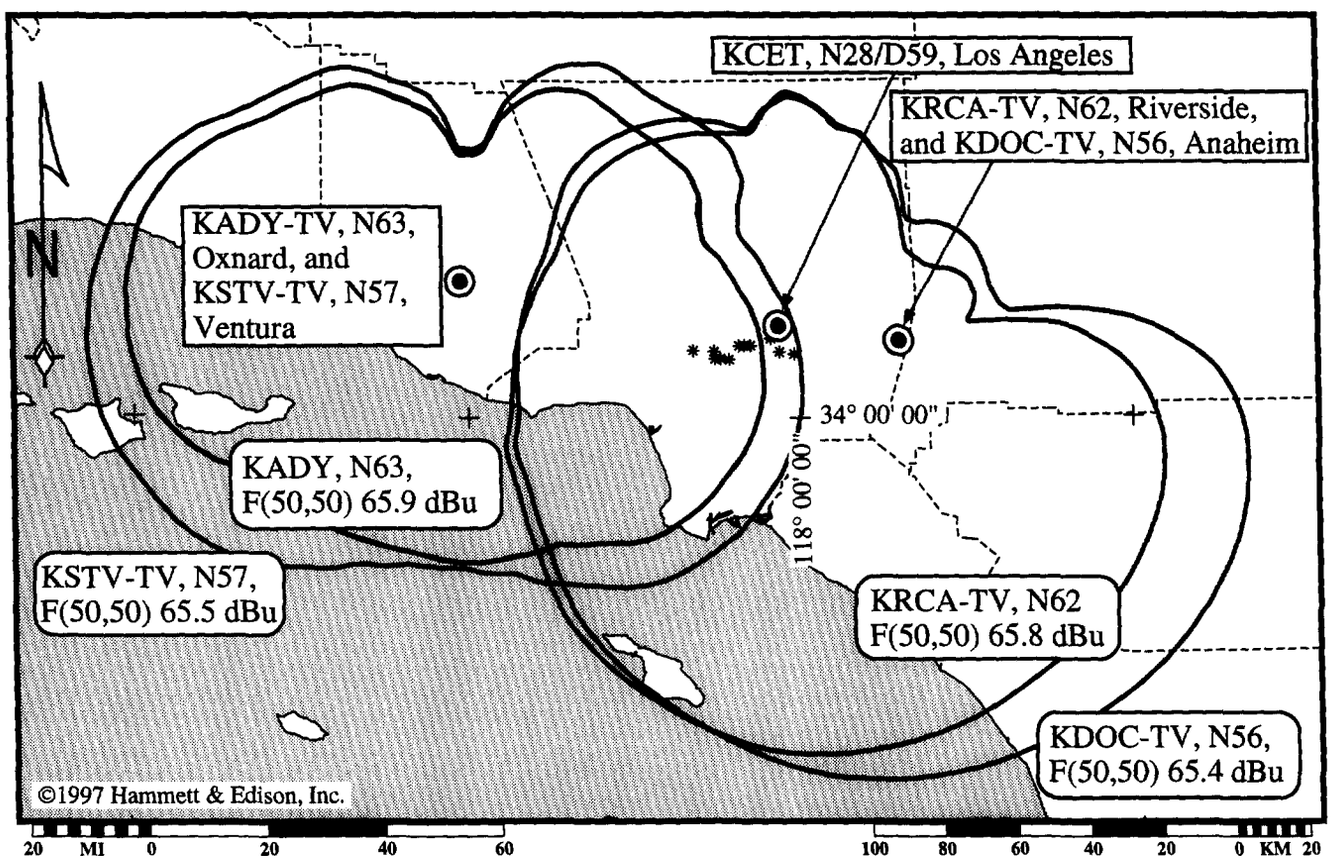
Subscribed and sworn to before me this 21st day of August, 1997

LINDA SIEMER
Comm. # 1099501
NOTARY PUBLIC - CALIFORNIA
Sonoma County
My Comm. Expires June 2, 2000

Linda Siemer

TV Station KCET • NTSC Channel 28 • Los Angeles, California

Interference to Others for KCET on D59
182 kW (DA) ERP at 927 meters HAAT
(Replication Pattern)

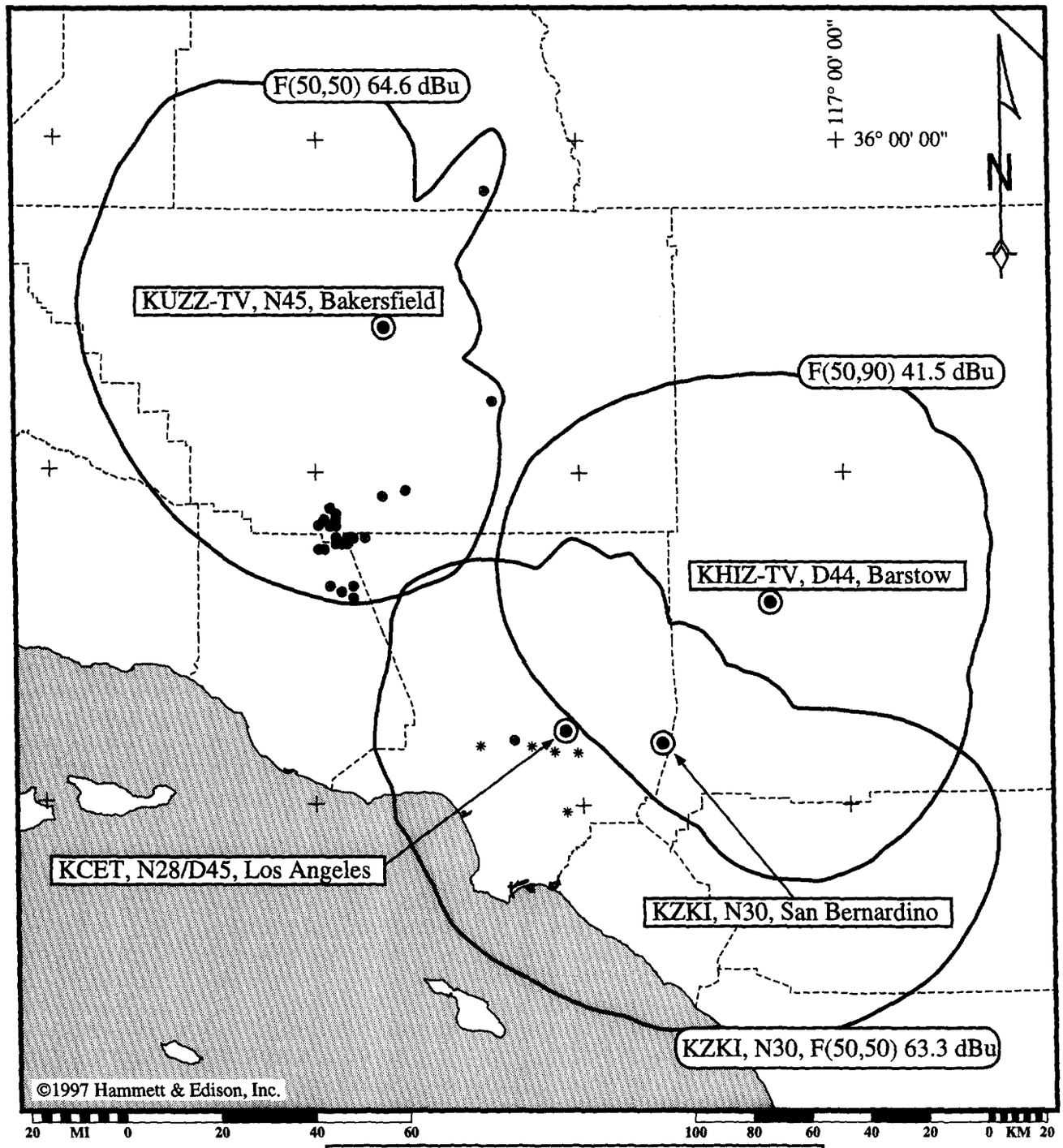


Geographic coordinate marks shown at 60-minute increments. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey.

×= No Signal (below threshold)
✱= Interference (with population in cell)
●= Interference (without population in cell)

TV Station KCET • NTSC Channel 28 • Los Angeles, California

Interference to Others for KCET on D45
182 kW (DA) ERP at 927 meters HAAT
(Replication Pattern)



Geographic coordinate marks shown at 60-minute increments. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey.

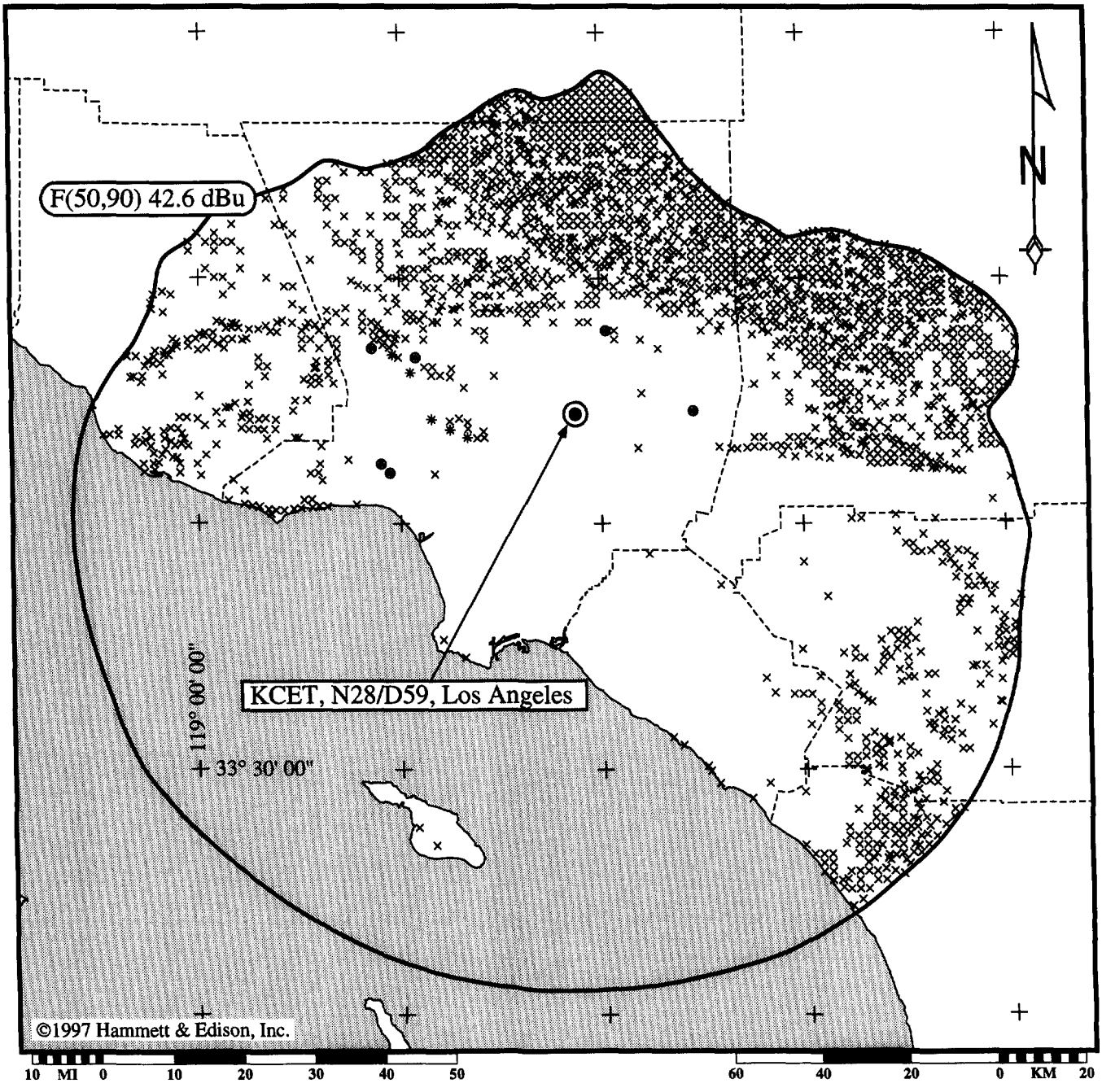
*= Interference (with population in cell)
●= Interference (without population in cell)

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

970814A
Figure 2

TV Station KCET • NTSC Channel 28 • Los Angeles, California

Interference to KCET on D59
182 kW (DA) ERP at 927 meters HAAT
(Replication Pattern)



Geographic coordinate marks shown at 30-minute increments. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey.

×= No Signal (below threshold)
✱= Interference (with population in cell)
●= Interference (without population in cell)

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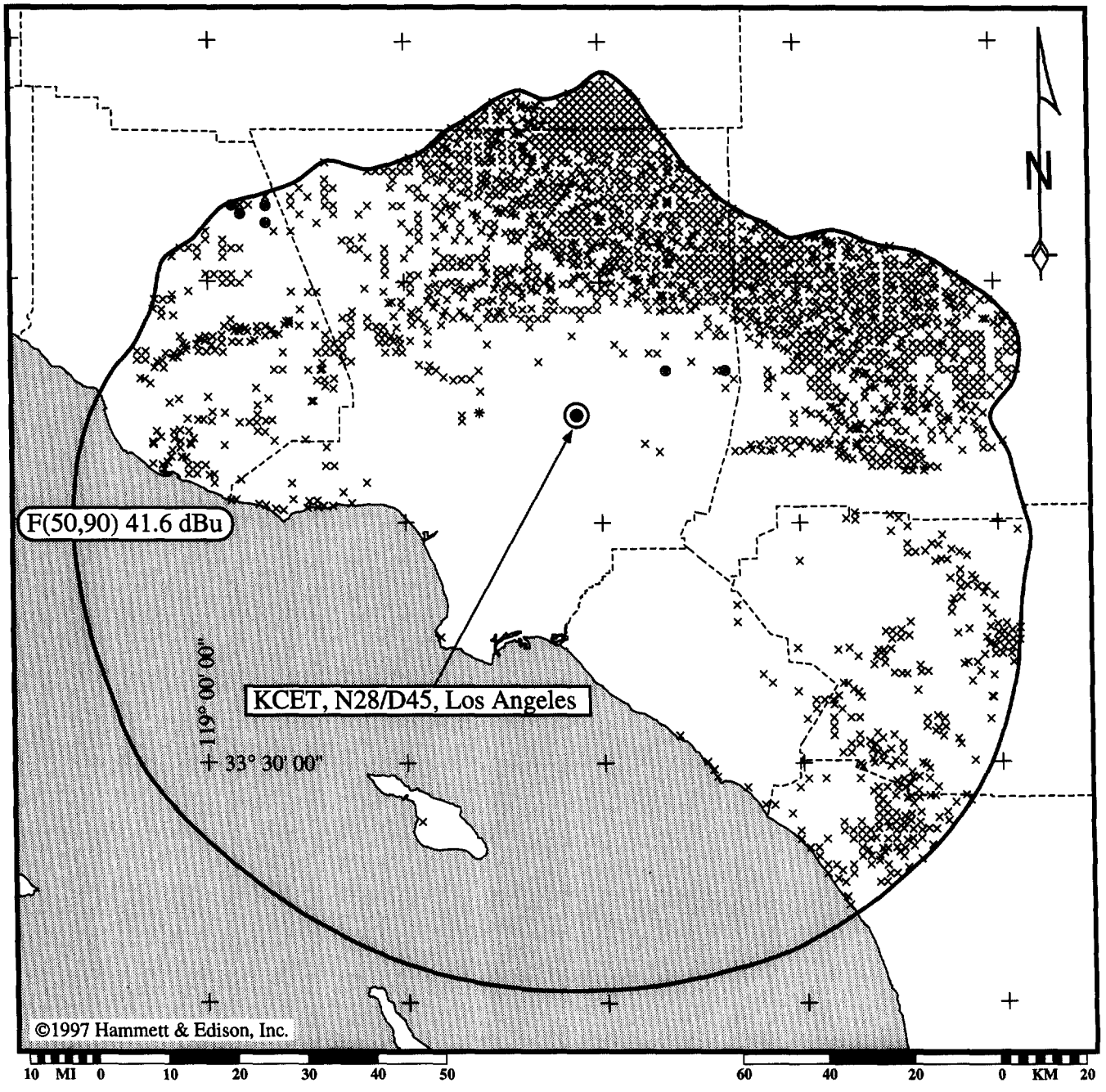
SAN FRANCISCO

970814A
Figure 3

TV Station KCET • NTSC Channel 28 • Los Angeles, California

Interference to KCET on D45
182 kW (DA) ERP at 927 meters HAAT
(Replication Pattern)



Geographic coordinate marks shown at 30-minute increments. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey.

×= No Signal (below threshold)
✱= Interference (with population in cell)
●= Interference (without population in cell)

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970814A
Figure 4

DTV.IXSTUDY™ Analysis Methodology

Implementation of FCC's Interference-Based Allocation Algorithm

On April 21, 1997, the Federal Communications Commission released its Sixth Report and Order to Mass Media Docket No. 87-268, establishing a final Table of Allotments for the transition from analog NTSC television service to a digital television ("DTV") service. The Commission utilized a complex set of computerized analysis tools to generate the DTV allotment table and added FCC Rules Section 73.623(b)(2), requiring that similar tools be employed to analyze individual DTV station assignments with regard to their potential interference to other DTV stations, DTV allotments, and existing or authorized NTSC facilities. Hammett & Edison has developed computer software to perform this function, based on an examination of the FCC software source code.

For any given NTSC or DTV station to be studied, the FCC analysis model first determines the location of the conventional F(50,50) Grade B contour of the NTSC station, or of the NTSC station associated with an assigned DTV station, using pattern information contained in the FCC engineering database and an assumed antenna elevation pattern. The model assumes that contour as an envelope, outside of which no protection from interference is implied or afforded. The location of the Grade B contour is also used to determine the assigned power for the DTV station, once again using conventional methods found in FCC Rules Section 73.699, Figures 9 and 10, but determining the power necessary on a radial basis to generate the associated DTV coverage contour (41 dBu for UHF, 36 dBu for high VHF Channels 7–13, and 28 dBu for low VHF Channels 2–6), for the assigned DTV channel. The maximum power determined using this method was assigned as the DTV operating power, provided it was calculated to be above established minimum power levels; otherwise, a minimum power level was assigned. Note that the use of this method usually creates a directional antenna pattern, even for DTV assignments to presently omnidirectional NTSC TV stations. The FCC requires that a DTV facility employ an antenna design that meets the calculated pattern, or that a nondirectional antenna be employed that does not exceed the directional pattern envelope in any direction, unless the creation of no new interference can be demonstrated.

In addition to the use of the Grade B envelope and an assumed directional transmitting antenna for all DTV facilities, the model assumes the use of directional receiving antennas at each studied location, or "cell." The characteristics of the receiving antennas are different not only for the low VHF, high VHF, and UHF frequency bands, but also for NTSC and DTV receiving situations, where, based on the FCC model, more directive antennas are employed for analysis of DTV reception.

The FCC analysis technique employs terrain-sensitive calculation methods based on Version 1.2.2 of the ITS Irregular Terrain Model, also known as the Longley-Rice model. For each NTSC or DTV station to be studied, a grid of cells, two kilometers on a side, fills the associated Grade B contour. The program first determines which of the cells is predicted to receive service from the associated station, using Longley-Rice with F(50,50) statistical weighting for NTSC stations and F(50,90) statistical weighting for DTV stations. Cells determined to have no service are not studied for interference from other stations.* Once cells having service are determined, the software analyzes potential interference from other NTSC or DTV stations, again using the Longley-Rice propagation algorithm and F(50,10) statistical weighting for all potential interfering signals. Each cell is evaluated using the desired-to-undesired ratios presented in FCC Rules Section 73.623 for each channel relationship, and cells determined to have interference are flagged and summed with the study results of other cells, resulting in the generation of total interference area figures and tabulations of total population contained within the summed cells.

The Hammett & Edison analysis software program employs all of the analysis features described above, as well as several other more subtle elements employed in the FCC allotment program. Additionally, the Hammett & Edison program provides a graphical element that allows the identification of all interference cells on a map with an associated tabulation, and the program generates a DTV antenna pattern envelope that shows areas that can be maximized without creating interference in any cells that were not already receiving interference. The program can be used to test implementation scenarios that involve changes to antenna height, antenna pattern, channel number, and transmitter location. Additionally, the program has the capability to determine coverage areas of DTV and NTSC stations, with interference cells omitted. The Hammett & Edison program can also identify cells that fall in major bodies of water, based on digitized map data, summarizing those cells separately in an interference study or excluding them from a coverage study. Arguably, cells in water do not require protection from interference.

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* It is noted that the Longley-Rice model is not always capable of determining, within certain confidence limits, whether a particular cell has service. In such cases, the Longley-Rice algorithm returns an error code; the FCC method for handling such error codes is to assume the associated cells have interference-free service, and as such, are not considered further. This assumption is presently being scrutinized by Hammett & Edison to determine its validity and to identify possible situations where significant actual interference areas may be overlooked from station studies.