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KSLS, Inc.
12401 West Olympic Boulevard
Los Angeles, California 90064

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

BY HAND DELIVERY

Magalie Roman Salas, Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

Re: Supplement to Comments of KSLS, Inc. on the
Ex Parte Submission of MSTV--MM Docket No. 87-268.

Dear Ms. Salas:

Enclosed herewith is a supplement to the comments submitted by KSLS, Inc. on December 17, 1997 in response to the **ex parte** submission of The Association for Maximum Service Television, Inc. in the above-referenced proceeding. Specifically, the supplement is the signed and notarized original of the engineering statement prepared for submission with the comments filed by KSLS, Inc. Due to delays with the overnight delivery service, a photocopy of the attached statement was filed with our comments. A stamped received copy of the comments is also attached for reference.

Should you have any questions concerning this supplement, kindly contact the undersigned.

Sincerely,



William C. Welty
Director of Engineering, Station KSCI(TV)

Enclosure

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List A B C D E

TV Station KSCI . Channel N18 . San Bernardino, California

Statement of Robert D. Weller, Consulting Engineer

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the licensee of TV Station KSCI, San Bernardino, California, to analyze the proposed “Improvements to the DTV Table,” by the Association for Maximum Service Television, Inc. (“MSTV”), for its impact on KSCI.

Background

TV Station KSCI is licensed to operate its NTSC television broadcasting facilities on Channel 18, with an effective radiated power (“ERP”) of 3,310 kilowatts at a height above average terrain (“HAAT”) of 725 meters, serving San Bernardino and the surrounding area. The Sixth Report and Order to FCC Mass Media Docket 87-268 (“6th R&O”), released April 21, 1997, allotted Channel 61 for the digital television (“DTV”) facilities of KSCI. In its November 20, 1997, *ex parte* comments to MM Docket 87-268, MSTV proposes use of Channel 66 for KSCI-DT.

MSTV Allotment Calculation Method Also Ignores Longley-Rice Errors

Section 73.623(c)(2) of the revised FCC Rules references Appendix B of the 6th R&O and OET Bulletin No. 69 as providing the procedure used to evaluate proposed modifications to allotted DTV facilities. Hammett & Edison obtained, directly from FCC OET, a copy of the computer software program used to generate the DTV allotment table. Once that software was operating properly and generating data consistent with that found in Appendix B, Table 1, presenting DTV allotment pairings with analog NTSC stations, the program was modified to serve as an analysis tool to study allotted DTV facility interference profiles and the effect of potential facility changes. A two-page description of that program accompanies this statement as Figure 1. This analysis program implements the desired-to-undesired (“D/U”) ratios and taboo channels of those in revised Rule 73.623(c)(2), those specified by the Advanced Television Systems Committee (ATSC) for the Grand Alliance System¹ as used by the FCC allotment computer program, or those specified in Advanced Television Technology Center (ATTC) Document #97-06, which was submitted as part of the MSTV filing.

As discussed in our June 11, 1997, engineering statement, which was filed as a part of a Petition for Reconsideration by KSCI, we discovered that the Longley-Rice propagation model used by the Commission often returned errors on some studied paths. FCC treatment of these error cells is not documented either in the Rules or in OET-69, but the FCC allotment program (and, correspondingly, the Hammett & Edison analysis program) counts these “cells” as *interference-*

¹ Appendix A, Part II, to the Sixth Report and Order, pages A-2 and A-3.

TV Station **KSCI** • Channel N18 • San Bernardino, California

free **service area**. The predominant error, returned as a level “3” error marker by the Longley-Rice software, meaning that “internal calculations show parameters out of range,” occurs primarily when an obstruction exists along the transmitter-receiver path that is nearby either the transmitter or receiver. In the case of KSCI, the population in these error cells totaled almost 1.5 million persons. The method used by MSTV also appears to treat these error cells as interference-free service, and therefore also fails to resolve this uncertainty.

MSTV Proposal Fails to Address Interference From KUSI-DT

Both the 6th R&O and MSTV have proposed allotting Channel 18 for the DTV facilities of Station KUSI-TV, Channel N5 1, San Diego, California. The co-channel KSCI(TV) NTSC and KUSI-TV DTV facilities are separated by 179.9 kilometers, 64.7 kilometers short of the 244.6 kilometers specified in FCC Rule Section 73.623(d). In its allotment study, the FCC calculated that about 274,000 persons, representing 2.3% of the current KSCI(TV) service population, could receive interference from the proposed co-channel KUSI-DT facility. The MSTV proposal increases the ERP of KUSI-DT slightly, and so is calculated to cause interference to about 295,000 potential viewers of KSCI.

MSTV Proposal Would Cause Additional Interference to KSCI

Apart from increasing the effective radiated power (ERP) of KUSI-DT, the allotment table proposed by MSTV allots three stations DTV channels that would cause adjacent-channel or taboo-channel interference to KSCI on Channel 18.

MSTV has proposed allotting Channel 33 for the DTV facilities of Station KCOP-TV, Channel N13, Los Angeles. The proposed KCOP-DT allotment would be on the picture image taboo of KSCI and is calculated to cause interference to about 82,000 persons, representing 0.7% of the current KSCI service population.

In addition, MSTV has proposed allotting Channel 32 for the DTV facilities of TV Station KCET, Channel N28, Los Angeles. The proposed KCET-DT allotment would be on the sound image taboo of KSCI and is calculated to cause interference to about 47,000 persons.

Finally, MSTV has proposed allotting Channel 17 for the DTV facilities of Station KESQ-TV, Channel N42, Palm Springs. The proposed KESQ-DT allotment would be first-adjacent to KSCI and is calculated to cause interference to about 15,000 persons.

TV Station **KSCI** . Channel **N18** . San Bernardino, California

Summary

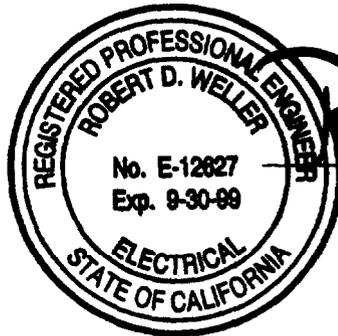
The proposed DTV assignment changes in the *ex parte* submission by MSTV fail to reduce (and, in fact, exacerbate) the interference from Station KUSI-DT to **KSCI's** Channel 18 NTSC facility. Further, the MSTV allotment proposal would place Stations KCOP-DT, KCET-DT, and KESQ-DT on channels that cause calculated additional interference to more than one-hundred thousand potential viewers of KSCI on Channel 18.

List of Figures

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

1. Paper describing DTV interference analysis program methodology.

December 16, 1997




Robert D. Weller, P.E.

Affidavit

State of California |
County of Sonoma | ss:

Robert D. Weller, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-12627 which expires September 30, 1999, 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 The University of California, Berkeley, in 1984, with a Bachelor of Science degree in Electrical Engineering and Computer Science, was an electronics engineer with the Federal Communications Commission from 1984 to 1993, with specialization in the areas of FM and television broadcast stations, cable television systems and satellite systems, and has been associated with the firm of Hammett & Edison, Inc., since June 1993,
3. That the firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the licensee of TV Station KSCI, San Bernardino, California, to analyze the proposed "Improvements to the DTV Table," by the Association for Maximum Service Television, Inc. (MSTV), for its impact on KSCI,
4. That he has carried out such engineering work 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.

Robert D. Weller, P.E.

Subscribed and sworn to before me this 16th day of December, 1997



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.

* It is noted that the Longley-Rice model is not always capable of determining, within certain confidence limits, whether a particular block 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.

COPY

COMMUNICATIONS
BEFORE THE

Federal Communications Commission

WASHINGTON, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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

To: The Commission

COMMENTS OF KSLs. INC.

KSLs, Inc., licensee of Station KSCI(TV), San Bernardino, California ("KSCI"), hereby submits its Comments with respect to the *ex parte* submission of MSTV and other broadcasters in the above-captioned proceeding.¹

KSCI broadcasts on channel 18 and was assigned channel 61 in the FCC's DTV Table of Allotments released with the Sixth Report and Order as Appendix B.² In the "improved" table submitted by MSTV ("MSTV Table"), KSCI's DTV assignment is changed to channel 66 and hundreds of other DTV channel reassignments are proposed. As explained below and in the attached engineering study prepared by the consulting engineering firm of Hammett and Edison, Inc., the MSTV Table proposals are unfair to small UHF stations and, in the case of KSCI, result in even more interference to KSCI's existing service.

¹ Ex Parte Submission Based on New Technical Discoveries to Help the Commission Improve the DTV Table of Allotments/Assignments, Submitted by The Association for Maximum Service Television, Inc. and Other Broadcasters, November 20, 1997. Pursuant to the Public Notice released by the Commission on December 2, 1997 in response to this submission, the instant Comments are filed.

² MM Docket No. 87-268, adopted April 3, 1997, FCC 97-115 (released April 21, 1997).

MSTV's claim to **neutrality** in its reassignment of DTV allocations is belied by the actual proposals contained in the MSTV Table, which reserves the best available allocations for the large VHF stations. MSTV's proposed "improvements" move all VHF stations in Los Angeles and San Diego to frequencies within the core spectrum, namely channels 7 to 51, while shifting most UHF allotments up and sometimes out of the core spectrum.³ Similarly, while interference problems for VHF stations in Southern California were addressed and presumably cured by MSTV's new proposal, no consideration was given to interference problems encountered by KSCI and other UHF stations.

Specifically, both the FCC and MSTV Tables assign channel 18 to KUSI in San Diego, California for DTV use. KSCI has already filed one petition with the Commission requesting a different assignment for KUSI due to the interference this assignment will cause to KSCI's existing NTSC service on channel 18.⁴ Engineering studies conducted on behalf of KSCI indicate that the assignment of channel 18 to KUSI will cause interference to KSCI's existing service affecting about 12% of its service area and 1½% of the population. The result is more interference to KSCI than to any other operational station in Southern California.⁵ KSCI thus requests that KUSI's DTV channel in San Diego be changed from 18 to 65 to protect KSCI's existing NTSC channel 18 from undue interference.

³ The FCC had assigned four of the seven VHF stations in the Los Angeles market to DTV channels outside the core spectrum. The MSTV proposal reassigns these stations to channels within the core spectrum while moving four Los Angeles UHF stations from channels within the core to channels outside the core.

⁴ *In re* Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, *Petition for Reconsideration* of KSLs, Inc., dated June 13, 1997.

⁵ See MSTV Table, Columns entitled "NTSC, New IX % NL Area," and "NTSC, Population Affected %."

The MSTV proposal also allots DTV channels to three stations that would cause adjacent-channel or taboo-channel interference to KSCI on channel 18 (see attached engineering exhibit). Such a proposal would cause calculated additional interference to more than 100,000 potential viewers of KSCI and should be rejected.

In short, the MSTV proposal does not adequately or equally represent the best interests of all stations, or even all of its members. While it is true that MSTV did release its proposed improvements to the broadcast industry and broadcaster reactions were requested, there were major changes to the MSTV Table (insofar as Southern California stations are concerned) between the draft circulated in October and the actual proposals filed in November. The changes included the reassignment of KSCI's DTV channel from channel 61 to 66. KSCI understands the desire to come to a final solution as quickly as possible. However, to allow two weeks during the holiday season for a small station to prepare comments on this sudden reassignment is difficult and unreasonable, especially considering that MSTV has had months to prepare its recommendations.

MSTV identifies three locations in the U.S. where there are major allocation problems.⁶ It is therefore KSCI's recommendation that the Commission send staff to those areas and hold regional meetings with the affected stations to come up with the solutions that will best address stations' needs. This method would require all stations to work together to solve shared problems.

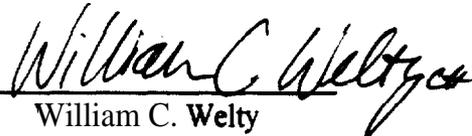
⁶ MSTV identifies the "most spectrum-congested parts of the country" as the Northeast, the Great Lakes region and the California coast and thereafter refers to them as the "Acute Problem Areas."

KSCI agrees with MSTV that it is becoming **necessary** to have a *de minimis* standard of permissible interference rather than the "no new interference" standard originally adopted by the Commission. Indeed, both the FCC and MSTV ignored taboo separations requirements in their allocation tables for the Los Angeles area. If taboo separations are ignored for purposes of the DTV allocation table, KSCI believes they should also not preclude future modifications to existing facilities. *This* more relaxed *de minimis* interference standard should permit future facilities modifications which are in the public interest that could otherwise be precluded by the more stringent "no new interference" standard.

WHEREFORE, KSCI respectfully requests the Federal Communications Commission to proceed with its resolution of allocation problems in this proceeding consistent with the foregoing statement.

Respectfully submitted.

KSLS, inc.

By: 
William C. Welty
Director of Engineering
Station **KSCI(TV)**
1240 1 West Olympic Boulevard
Los Angeles, California 90064

Dated: December 17, 1997

TV Station KSCI . Channel N18 . San Bernardino, California

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TV Station KSCI . Channel N18 . San Bernardino, California

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MSTV Proposal Falls to Address Interference From KUSI-DT

Both the 6th R&O and MST’s have proposed allotting Channel 18 for the DTV facilities of Station KUSI-TV, Channel N51, San Diego, California. The co-channel KSCI(TV) NTSC and KUSI-TV DTV facilities are separated by 179.9 kilometers, 64.7 kilometers short of the 244.6 kilometers specified in FCC Rule Section 73.623(d). In its allotment study, the FCC calculated that about 274,000 persons, representing 2.3% of the current KSCI(TV) service population, could receive interference from the proposed co-channel KUSI-DT facility. The MSTV proposal increases the ERP of KUSI-DT slightly, and so is calculated to cause interference to about 295,000 potential viewers of KSCI.

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TV Station KSCI . Channel N18 . San Bernardino, California

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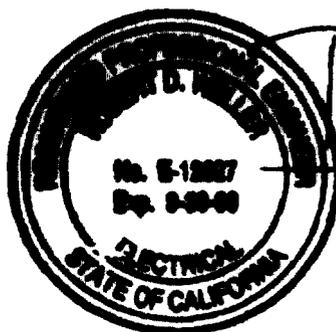
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List of Figures

In carrying out these engineering studies, the following attached figure was prepared under my **direct** supervision:

1. Paper describing DTV interference analysis program **methodology**.

December 16, 1991



Robert D. Weller, P.E.

Affidavit

State of California

County of Sonoma

ss:

Robert D. Weller, being first **duly** sworn upon oath. deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-12627 **which** expires September 30, 1999. 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 The **University of California**, Berkeley, in 1984, **with** a Bachelor of Science degree in Electrical Engineering and Computer **Science**, **was an electronics engineer with** the Federal **Communications** Commission from 1984 to 1993, **with** specialization in **the areas of** FM and television broadcast stations, cable television systems and satellite systems, and **has been associated** with the firm of **Hammett & Edison, Inc.**, since June 1993,
3. That **the firm of Hammett & Edison, Inc.**, Consulting Engineers, **has been retained by the** licensee of TV Station KSCI, San Bernardino, California, to **analyze the proposed** "Improvements to **the DTV** Table." by the **Association for Maximum Service Television, Inc.** (MSTV), for its impact on KSCI,
4. That he has carried out such engineering work **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**.



Robert D. Weller, P.E.

Subscribed and sworn to before me this 16th day of December, 1997



DTV.IXSTUDY™ Analysis Methodology

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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 73.423 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 block 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.