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Federal Communications Commission
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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

ORIGINAL FILE

To: The Commission

COMMENTS OF THE
LAND MOBILE COMMUNICATIONS COUNCIL

The Land Mobile Communications Council ("LMCC") hereby submits the following comments in response to the Commission's Second Further Notice of Proposed Rulemaking in the above-captioned proceeding regarding proposed channel allotments for Advanced Television (ATV) stations.

LMCC is a non-profit association of organizations representing users of land mobile radio and providers of land mobile services and equipment. LMCC is dedicated to securing and maintaining sufficient allocations of radio frequencies for the land mobile radio services in order to meet the immediate and long-term requirements of all land mobile radio users. In this capacity, LMCC acts on behalf of the vast majority of public safety, business, industrial, land transportation, private, common carrier, and land

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mobile radio users, as well as a diversity of land mobile service providers and equipment manufacturers.[1]

1/ LMCC's membership includes:

American Association of State Highway and Transportation Officials
American Automobile Association
American Mobile Telecommunications Association
American Petroleum Institute
American Trucking Associations, Inc.
Association of American Railroads
Associated Public-Safety Communications Officers, Inc.
Cellular Telecommunications Industry Association
Forest Industries Telecommunications
Forestry-Conservation Communications Association
International Association of Fire Chiefs
International Association of Fish and Wildlife Agencies
International Municipal Signal Association
International Taxicab and Livery Association
Manufacturers Radio Frequency Advisory Committee, Inc.
National Association of Business and Educational Radio, Inc.
National Association of State Foresters
Special Industrial Radio Service Association, Inc.
Telecommunications Industry Association
Telocator, The Personal Communications Industry Association
Utilities Telecommunications Council

INTRODUCTION AND SUMMARY

LMCC indicated in its response to the earlier phases of this proceeding that:

- Gen. Docket No. 85-172, which related to Land Mobile sharing of unused UHF television spectrum, should remain open.

- Land Mobile sharing of certain television channel 14-20 spectrum in designated cities has been very successful, and must be fully protected.

- The Commission should enhance its ability to reclaim unused television spectrum by: immediately making available for mobile use any allotted ATV channels for which no application is received, or for which construction is not completed in the designated timeframe; and immediately making available any NTSC channels upon which operation is ceased, rather than waiting for the proposed 15 year transition timeframe to expire.

LMCC is pleased that the Commission has already been responsive to the first two points above; we await Commission action on the last point.

The instant phase of this proceeding raises additional matters of significant importance to LMCC, and we thus offer these comments. In summary, our views are:

- The Commission's proposal to implement ATV completely within the UHF television band is appropriate, and the FCC should take steps to insure that VHF television frequencies are eventually released to satisfy other critical spectrum needs.

- The Commission's geographic spacing proposal for protection of co- and adjacent channel Land Mobile operation from ATV is appropriate.

- The short spaced ATV allotments in the Commission's proposed table are inadequate, and will likely cause interference to Land Mobile operations.

- Protection of Land Mobile from UHF television channels 14 and 69 operation may have been overlooked by the Commission, and must be considered.

- Takeback of Detroit channels 15 and 16, and Cleveland channels 14 and 15 is inappropriate; the Commission should instead renew its efforts to obtain agreement with Canada for use of these channels by Land Mobile.

THE COMMISSION'S PROPOSAL TO IMPLEMENT ATV COMPLETELY WITHIN THE UHF TELEVISION BAND IS APPROPRIATE, AND SHOULD BE ADOPTED

LMCC has previously indicated that the Land Mobile community has an ongoing need for new spectrum to permit the provision of telecommunications services to a growing radio - based population. This need reflects a continuous growth in Land Mobile service over many years; moreover, it is based on substantial gains in spectrum efficiency over those years by the institution of such actions as repeated reduction in authorized channel spacing, implementation of trunking and data communications, and recently, the use of new modulation techniques. This substantial effort in improving spectrum efficiency, we would point out, is in stark contrast to the efforts of the television broadcast industry -- the same channel bandwidth is in use today as was employed when television was first commercially launched many years ago. As a matter of fact, it will be necessary for a broadcast station to use twice the spectrum previously required during the transition from NTSC to ATV.

In view of the Land Mobile industry's need for spectrum, LMCC welcomes the Commission's proposal to implement ATV completely within the UHF television band. This will, at some time in the future, permit the Commission to reallocate the valuable VHF band for other, more pressing needs such as mobile communications. Although the time frame of 15 years for complete conversion to an all UHF ATV service is too long, there is, at

least a meaningful opportunity, sometime "down the road", to implement a sound spectrum management plan.

LMCC generally concurs with the rationale expressed in the Notice relative to some of the advantages of a UHF-only ATV service. The design of television receivers would be expected to be simplified, and potentially less costly to the consumer. Also the potentially significant disparity that might exist if some broadcast stations were assigned VHF channels, and others UHF channels, would be substantially reduced, thus facilitating a "level playing field" for all concerned.

LMCC wishes to emphasize that whereas it views the future potential availability of VHF television spectrum as a significant opportunity for mobile use in the relatively distant future, this is no way diminishes the need to consider, in a timely fashion, increased sharing of the UHF television band as proposed in Gen. Docket 85-172. This docket should be reactivated as soon as possible. LMCC notes, in particular, that there is now pending a request for a waiver of the Commission's rules to allow land mobile use of channel 16 in New York to alleviate serious spectrum shortages.

THE COMMISSION'S GEOGRAPHIC SPACING PROPOSAL FOR PROTECTION OF CO- AND ADJACENT CHANNEL LAND MOBILE OPERATION FROM ATV IS APPROPRIATE

The Commission in this proceeding proposes to reduce the co-channel separation distance between a television station and (the center-city

of) Land Mobile operations from 212 miles to 155 miles, and reduction of a corresponding adjacent channel separation from 140 miles to 110 miles. This proposal is based on the anticipated reduction in television transmitter power of 10 dB.

LMCC generally concurs with the Commission's proposal. An analysis of the proposed co-channel operation is contained in Appendix A. The appendix demonstrates that operation involving ATV at the 155 miles spacing from a Land Mobile center-city would provide adequate protection.

Appendix B contains an analysis of the proposed adjacent channel spacing showing that the 110 mile proposed spacing should provide adequate protection for Land Mobile operations assuming that the television transmitter is designed to provide about 40 dB of attenuation to any out-of-band signal. This level of attenuation is believed to be readily achievable; on the other hand, if there were no attenuation to the out-of-band television signal the spacing would have to be the proposed co-channel spacing of 155 miles.

It should be noted that this analysis of adjacent channel protection applies to the case of television interfering with Land Mobile operation. The inverse form of potential interference, Land Mobile-to-television, has not been addressed herein. LMCC is unaware of any cases of such interference associated with current Land Mobile use of television channels 14-20

involving adjacent channel assignments. Nevertheless, it may be prudent, after the specific characteristics of ATV television receivers are ascertained, to verify that this remains true with a reduced adjacent channel geographic spacing.

THE SHORT SPACED ATV ALLOTMENTS IN THE COMMISSION'S PROPOSED TABLE ARE INADEQUATE, AND WILL LIKELY CAUSE INTERFERENCE TO LAND MOBILE OPERATIONS

The Commission's proposed ATV table contains one short-spaced co-channel allotment (channel 16, San Diego) and five short-spaced adjacent channel allotments. Each of these allotments offers significant potential for serious interference to existing Land Mobile operations, including several vital public safety communications systems.

An analysis of the proposed co-channel allotment is contained in Appendix C. The proposed allotment provides a spacing of only 102 miles (the Commission's "normal" co-channel spacing is proposed to be 155 miles). This spacing will result in an interfering signal which is greater than the sensitivity of a Land Mobile receiver, even when the well known phenomenon of ducting is ignored. If ducting is considered, it is estimated that the resultant protection from the proposed ATV allotment is about 20-25 dB short of that required. Clearly, channel 16 must not be allotted for ATV use in San Diego.

All of the proposed short-spaced adjacent channel allotments are sufficiently close to the respective center-city of interest that ATV operation could well be fully coincident with Land Mobile operation. As discussed in the next section, the problems with same-area television and Land Mobile operation are well-known, and often very serious. Thus, LMCC objects vigorously to all of the proposed short-spaced adjacent channel allotments. As a matter of fact, the use of the term "short-spaced" is inappropriate in this case, as the television and Land Mobile operations could be co-located. The Commission must find alternative allotments for these 5 short-spaced adjacent channel cases.[2]

PROTECTION OF LAND MOBILE FROM UHF TELEVISION CHANNELS 14 AND 69 OPERATION MAY HAVE BEEN OVERLOOKED BY THE COMMISSION, AND MUST BE CONSIDERED

The Commission's proposed ATV table contains 49 additional allotments of channel 69 and 15 additional allotments of channel 14. LMCC wishes to point out that use of these channels, which are adjacent to long-standing Land Mobile operation in the 806-821 MHz and 450-470 MHz bands respectively, have caused serious problems in the past (e.g. channel 69 in Atlanta, Georgia; channel 14 in Houston, Texas, and numerous others).

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[2]As previously discussed, a request for waiver has been submitted to permit Land Mobile use of television channel 16 in New York. As discussed in this Section, use of this channel for ATV could seriously interfere with existing Land Mobile use of channel 15 in this area. Thus there are two compelling reasons why channel 16 should not be allotted for ATV use in New York.

Use of these channels for ATV may likewise cause significant problems, although it is difficult to quantify potential levels of interference until the characteristics of ATV transmitters are known. Some of the allotted channels may be in sparsely populated areas where the likelihood of interference is diminished because of relative proximities of Land Mobile operations to television stations, as well as potentially less intense use of that spectrum. Other proposed channels, however, such as 69 in Los Angeles and Chicago, and 14 in Dallas are in areas where Land Mobile frequencies are heavily congested.

Section 73.687 of the Rules proscribes that a television station field strength may not exceed 17 dBμ at the Land Mobile site in those cases where Land Mobile is "first-in".[3] This requirement presumably will apply also to ATV. Thus the Commission, as well as potential ATV licensees, should be fully aware of the potential serious ramifications of the use of either channel 14 or 69. LMCC strongly believes that the most prudent course of action is to avoid use of these channels.[4]

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[3]Motorola filed a petition on October 17, 1991, for partial reconsideration in MM Docket 87-465, which seeks to limit the television field strength to 11 dBμ. LMCC supported this petition. The Commission has not yet acted on this matter.

[4]With regard to potential ATV use of channels 14 and 69, as well as potential TV use of co- and adjacent channels to Docket 18261 Land Mobile sharing channels, it may ultimately be necessary to perform appropriate testing to ascertain the actual levels of interference that would be experienced, both for the ATV-to-Land Mobile and Land Mobile-to-ATV cases.

TAKEBACK OF DETROIT CHANNELS 15 AND 16, AND CLEVELAND CHANNELS 14 AND 15 IS INAPPROPRIATE; THE COMMISSION SHOULD INSTEAD RENEW ITS EFFORTS TO OBTAIN AGREEMENT WITH CANADA FOR USE OF THESE CHANNELS BY LAND MOBILE

The Commission Rules currently prohibit Land Mobile use of television channels 15 and 16 in Detroit, and 14 and 15 in Cleveland, because of the lack of an agreement with the Canadian government, notwithstanding that the Commission adopted the television channel 14-20 sharing plan for Land Mobile nearly two decades ago in Docket 18261.

LMCC does not concur with the Commissions proposal to take back these channels now for ATV use. There are significant unmet Land Mobile needs in Detroit and Cleveland as a result of the failure to reach an agreement with Canada. Therefore, LMCC believes that the Commission should find alternative channels for use by ATV in Detroit and Cleveland and should continue to pursue negotiations with Canada to make these Docket 18261 channels available for Land Mobile use.

WHEREFORE, THE PREMISES CONSIDERED, the Land Mobile Communications Council respectfully requests the Federal Communications Commission to act in a manner fully consistent with the foregoing statement.

Respectfully submitted,

LAND MOBILE COMMUNICATIONS COUNCIL

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Dated: November 16, 1992

APPENDIX A

SUMMARY:

At the present time, the required minimum spacing between co-channel NTSC transmitters and the center of the city serving the land mobile service is 212 miles. It is proposed to reduce that spacing to 155 miles for ATV stations because they are expected to operate with 10 dB less power than NTSC stations 1 . In this Appendix, it will be shown that a digital modulation type of ATV modulation with this reduction in power and spacing will maintain acceptable performance of the existing land mobile operations.

INTRODUCTION:

Land Mobile receivers in the 470 MHz to 512 MHz band operate in the presence of Rayleigh multipath propagation with a sensitivity at or better than 1.0μ v, which is -107 dBm into a 50 ohm load. The interference that is produced by an NTSC TV station operating co-channel with the land mobile station will be computed, and it will be shown that acceptable performance results. Then, the interference that will be produced if the proposed reduction in spacing is implemented for ATV will be computed. The same acceptability criteria will be applied, to show that acceptable performance should be possible under that condition also.

ANALYSIS OF EXISTING INTERFERENCE:

Paragraph 90.305 of the Commission's Rules state where land mobile stations, operating co-channel with TV stations, can be located in the city in which Land Mobile operation is permitted. Base stations can be located 50 miles from the city center, and mobile and control stations must be located within 30 miles of their associated base stations. Figure A-1 shows, in block diagram form, these locations.

The potential exists for interference to mobile receivers which are located about 5 feet from the ground, and base receivers that are located at the same height as the base transmitters. The Commission permits base transmitters located at an elevation of 500 feet to transmit the maximum power of 1000 watts, and that height will be used for base receivers in the analysis herein. Even though the mobile can be located 30 miles closer to the ATV station, the cluttered environment in which it operates attenuates the signal so that it does not experience the worst interference. Therefore, the level of interfering power that will be present at the base will be computed, and it is evident that if it is not significant at the base, it will be acceptable at the mobile also.

The land mobile base receivers operate on the upper 3 MHz of the 6 MHz channel. They are therefore co-channel with the sound carrier of the TV

station. This carrier is 10 dB lower than the picture carrier which can radiate a maximum of 5 MW of ERP. A frequency swing of 25 kHz is defined as 100 percent modulation, and so there is 500 kW of power that occupies 50 kHz when modulation is applied to the sound carrier.

The land mobile receiver noise bandwidth is approximately 10 kHz wide, so it intercepts only one fifth of the sound carrier power. The ERP that is radiated co-channel with the land mobile receiver is therefore 100 kW.

The land mobile receiver located 50 miles from the center of the city for which service is intended will typically operate with a directional antenna oriented towards the city. There will therefore be a reduction in the ability to receive signals toward the interfering TV station. In this example, we will use a factor of 10 dB for the protection afforded by the directional antenna. If the receiver is located at the center of the city, an omnidirectional antenna is typically used so that no protection is afforded by any directionality. However, the increased separation from the TV station provides slightly more than 10 dB of additional path loss; thus, this analysis will serve to quantify the worst case interference.

The R6602 propagation curves have been computerized, by the FCC, and the algorithm of the program TVFMFS 2 has been used to compute the interference produced. These curves are based on a receiver HAAT of 30 feet, but the receiver in this analysis is located at a HAAT of 500 feet. Therefore, a correction of 6 dB per doubling of the height will be used. In addition, the curves are based on the assumption that the receiving antenna is co-polarized with the radiated wave. That is not the case here, and the base antenna is located up above the multipath clutter, so a factor of 20 dB will be taken to account for the cross polarization.

Finally, it is necessary to convert the received signal strength impinging on the antenna to power out of the antenna and into the 50 ohm transmission line. That will be done using the well known expression 75 + 20 log(f), where log is the logarithm to the base 10 and f is the frequency in MHz. A frequency of 500 MHz which is near the center of the band of interest will be used in the analysis. The power received by the land mobile receiver operating co-channel with the sound carrier is computed below.

R6602 F(50,10) Field Strength from 1000′	3.3 dBμ/M
100 kW ERP	20.0 dB
Cross Polarization	-20.0 dB
Conversion to Power, -75 - 20 log(f)	-129.0 dB
Directional Receiving Antenna	-10.0 dB
Height correction, 30′ to 500′	+24.4 dB
Total Power	-111.3 dBm

As stated above, the land mobile receiver typically operates with a sensitivity of -107 dBm. This is 4.3 dB above the level of the computed interference which will occur 10 percent of the time. At frequencies removed from the sound carrier, there is less ERP from the NTSC station, reducing further the signal into the Land Mobile receiver. Experience has shown that this level of interference provides acceptable performance for the land mobile community.

ANALYSIS OF PROPOSED INTERFERENCE:

It is stated in the Second Further Notice that the power of the ATV signal is expected to be 10 dB lower than the existing NTSC station. It is assumed that this refers to the ERP. However, nothing is stated regarding the nature of the modulation, and hence the spectrum of the ATV station is unknown. In this analysis, We will assume that some form of digital modulation is used, and that the spectrum of that modulation is flat over the 6 MHz of the channel, and has noise like qualities.

The ERP of the assumed ATV station is therefore 0.5 MW which is spread over the 6 MHz channel. The Land Mobile receiver is only 10 kHz wide, therefore, the ATV power intercepted by the Land Mobile IF will be 27.8 dB (10 log(10/6000) dB) below the total ERP. This is 833 watts. As before, the Land Mobile receiving antenna will be directional with 10 dB of protection from the ATV signal; the HAAT will remain at 500 ft.

The proposed spacing from an ATV station transmitter to the center of the city serving the Land Mobile service is 155 miles. The Land Mobile Base can be located 50 miles toward the ATV station, so the separation used in the computation is 105 miles. Nothing was stated regarding the polarization of the ATV signal, so it will be assumed to be horizontally polarized, again providing 20 dB of protection to the Land Mobile receiver. The interference power into the land mobile receiver is computed below.

R6602 F(50,10) Field Strength from 1000′	18.0 dBμ/M
833 W ERP	-0.8 dB
Cross Polarization	-20.0 dB
Conversion to Power, -75 - 20 log(f)	-129.0 dB
Directional Receiving Antenna	-10.0 dB
Height correction, 30′ to 500′	+24.4 dB
Total Power	-117.4 dBm

This power is over 10 dB below the desired signal normally received at the Land Mobile Receiver; therefore, it is believed that it should not produce unacceptable interference. However, it should be noted that there are relatively few channels located on the sound carrier of the NTSC signal

which presently experience the level of interference computed above. In the proposed ATV case, all receivers will experience the same level of interference, and there will be no quiet area of the spectrum to provide relief for special cases.

CONCLUSION:

It has been shown that the interference that can be expected by Land Mobile receivers operating co-channel with ATV stations at the proposed reduced minimum spacing of 155 miles is at a level somewhat less than exists today.

REFERENCES:

1. In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, Second Further Notice of Proposed Rule Making, MM Docket No. 87-268, Paragraph 46, Adopted July 16, 1992

2. Field Strength Calculation for TV and FM Broadcasting (Computer Program TVFMFS) by Gary S. Kalagian, January, 1976, FCC Report No. RS 76-01

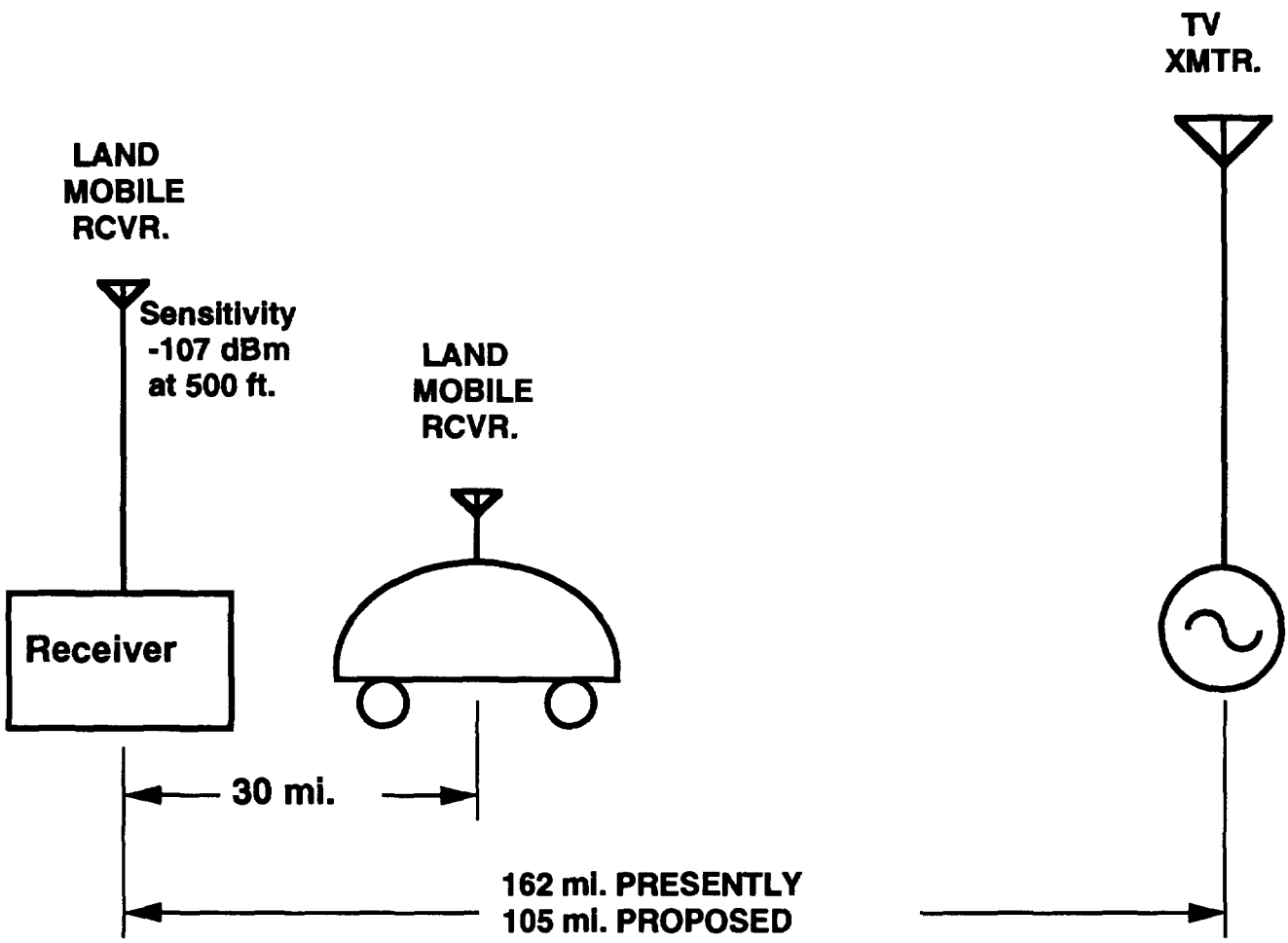

Figure A-1 Minimum spacing permitted between Land Mobile stations and TV stations

APPENDIX B

SUMMARY:

The proposed adjacent channel spacing requirement between ATV transmitters and the center of the city in which Land Mobile operations are permitted is 110 miles. When the path loss and receiver adjacent channel selectivity are taken into account, there is no problem with that spacing. When splatter from the ATV transmitter into the receiver IF is considered, it is shown that 40 dB of attenuation is needed on the adjacent channel 25 kHz from the band edge, and it is suggested that digital techniques should easily provide this protection.

INTRODUCTION:

It is reasonable to assume that the ATV transmitters will operate at power levels that are reduced from those of NTSC. Assuming that they will use digital techniques for their modulation, the interference into Land Mobile receivers because of their finite adjacent channel selectivity will be computed. This will be shown to be negligible. Then, the splatter of the ATV transmitter that can be permitted into the pass band of the IF of the Land Mobile receiver on the adjacent channel will be computed, and a technically achievable limit will be suggested that should permit acceptable performance of both the ATV and Land Mobile services.

ANALYSIS:

The Commission proposes to establish an adjacent channel spacing requirement of 110 miles between ATV transmitters and the center of the city where Land Mobile operation is permitted in the 470 to 512 MHz band. This can result in the spacing between the ATV transmitter and adjacent channel Land mobile base station receivers as small as 60 miles. With a TV station at 1000 feet HAAT, a Land mobile station at 500 feet, and 4/3 earth radius for radio propagation there is line of sight between the two stations. Thus, free space propagation is appropriate to consider, and between free space dipoles this loss is 122 dB.

A typical specification for land mobile receiver protection from a signal on an adjacent Land Mobile channel 25 kHz away is better than 75 dB. The sensitivity for this receiver in the multipath environment is at or better than 1.0μV or -107 dBm. The NTSC TV signal has been horizontally polarized, and if the ATV signal is also horizontal, we estimate that there will be 20 dB of cross polarized protection between ATV and Land Mobile signals.

The Land Mobile receiver protection from the ATV in-TV band signal is then 122 + 20 + 75 = 217 dB. If the ATV signal power is 10 dB below that of NTSC and is spread over the 6 MHz band as discussed in Appendix A, then the in-TV band power contained in the bandwidth of a Land Mobile receiver

channel will be a maximum of 833 watts or +59.2 dBm. The resulting signal into the Land Mobile receiver will be 59.2 - 217 = -157 dBm which is well below the -107 dBm sensitivity.

However, the ATV signal must be attenuated out of band so that it does not come directly into the pass band of the receiver. From Appendix A, the computed co-channel power into a Land Mobile receiver from todays NTSC signals is -111.3 dBm. This occurs ten percent of the time, but the adjacent channel signal under consideration is line of sight, so it will occur virtually 100 percent of the time. If we allow a 10 dB reduction to account for this difference, then the allowable signal into the adjacent channel should be no greater than -121.3 dBm.

Working backward with the path loss of 122 dB and the cross polarization protection of 20 dB, we find that the out of band signal centered in a 25 kHz band in a 10 kHz bandwidth should be no greater than -121.3 + 122 + 20 = +20.7 dBm. This represents a reduction of 59.2 - 20.7 = 38.5 dB from the in band signal. This protection for the adjacent channel Land mobile signal should be easily obtained using digital techniques and suitable reduction in occupied bandwidth from the full 6 MHz channel width.

CONCLUSION:

The adjacent channel spacing proposed by the commission appears to provide acceptable performance to the Land Mobile receivers, assuming reasonable parameters for the ATV signals.

APPENDIX C

SUMMARY:

The proposed ATV Table has one allotment for San Diego, CA which is co-channel with existing public safety Land Mobile operations on channel 16 in Los Angeles, CA and is at a spacing which does not meet the minimum proposed spacing to center city of 155 miles. The spacing from the proposed Site 2 in San Diego to the center of LA is about 102 miles. The interference which would be produced in existing Land Mobile receivers would be prohibitive under this close spacing and the enhanced propagation conditions that exist in southern California. Therefore, it is recommended that the commission consider the use of another channel in place of the proposed channel 16.

INTRODUCTION:

It is recognized that the Southern California area is very crowded with TV stations, and this fact can make it difficult to find allotments for ATV stations that meet the minimum spacing proposed by the commission. However, a portion of the path between Los Angeles and San Diego is over the ocean. It is well known that such paths produce enhanced propagation conditions. This alone would suggest that the minimum spacing between co-channel operations of any kind should be maintained at a minimum, and perhaps increased in this area.

However, the proposed ATV Table provided by the commission includes one entry which is at channel 16 in San Diego. This is co-channel with existing Land Mobile operations in the Los Angeles area. The proposed channel 16 San Diego ATV location (Site 2) is 102 miles from the center of LA. This is 53 miles less than the spacing standards proposed by the commission. This will produce unacceptable interference to the existing Land Mobile operations as will be shown below.

ANALYSIS:

The sites used by the existing Land Mobile operations in Los Angeles are on mountain tops. The elevation of typical Land Mobile antennas on Mount Lukens, for instance is in excess of 500 feet HAAT (and the absolute elevation is in excess of 5000'). The HAAT of existing NTSC VHF TV stations on Site 2 in the San Diego area varies from 226 to 229 feet, and the distance to Mount Lukens is about 107 miles.

These parameters can be used to compute the received power at a Land Mobile Receiver as was done in Appendix A. However, the antennas on Mount Lukens are pointed toward the San Diego area, and not away from the

interference as was assumed in the prior case. Additionally the terrain roughness factor in this case is set to 0 in the propagation curves because the over the water path is very smooth. Also, the long over the water path is well known for ducting and other propagation anomalies. The computed power received using the standard R6602 algorithm is:

ITEM	**SITE 2**
R6602 F(50,10) Field Strength	16.7dBμ/M
833 W ERP	-0.8 dB
Cross Polarization	-20.0 dB
Conversion to Power, -75 - 20 log(f)	-128.7 dB
Height correction, 30′ to 900′	+29.5 dB
Total Power	-103.3 dBm

This signal level is higher than the sensitivity of the land mobile receivers (-107 dBm) and is clearly unacceptable. In Appendix A, the received interfering power from ATV was computed at a level of -117.4 dBm, which is considered acceptable. The difference between the above computed value and the just-mentioned acceptable value is 14.1 dB. In addition, margin should be added to allow for the ducting that is known to exist. Therefore, it is estimated that 20 to 25 dB additional protection is needed to permit acceptable operation of the existing Land Mobile operations if channel 16 is used for ATV at the sites of the existing NTSC stations in San Diego.

CONCLUSION:

It has been shown that there is the potential for significant interference to existing Land Mobile operations in the Los Angeles area if channel 16 is used for ATV operations in San Diego. It is recommended that 20 to 25 dB of additional protection would be required in the direction of Los Angeles to account for ducting. An alternative ATV channel should be found for San Diego.