APPENDIX A

This is a UHF television channel interference calculation, using the unrealistic assumption that the earth is flat (K = infinity).

Consider Channel 56 in Boston, Massachusetts and calculate the interference range under the flat earth (K = infinity) assumption.

The relevant transmitter and receiver specifications are:

Frequency (TV Channel 56):	725 MHz
Transmitter Power (FCC max. allowed = +97 dBm):	+83 dBm
Transmitting Antenna gain:	0 dB
Minimum Detectable Signal (MDS) of TV receiver	-60 dBm
(Based on 6 MHz IF bandwidth and 6 dB Noise Figure, SNR=40 db)	
Receiver Antenna Gain:	17 dB
Required C/I = 40 dB	

The free space loss (FSL) that can be accommodated under these conditions is related to the transmitter power and receiver sensitivity by:

FSL = EIRP + G - MDS + C/I

where

EIRP is the effective isotropic radiated power at the transmitter (in dBm)

G is the gain of the receiving antenna (in dB)

Solving for FSL under the assumed conditions,

FSL = +83 dB + 17 dB - (-60 dB) + 40 dB
= 200 dB

This is the amount of free space path loss which must be encountered by a television signal before another non interfering television station can be established. But FSL due to simple propagation, in the absence of earth curvature effects, is given by

FSL (dB) = 36.58 + 20 log(F) + 20 log(d)

where

F = transmitter frequency (MHz)

d = transmitter to receiver path (statute miles)

If this is solved for the distance of propagation necessary to provide 200 dB of loss at 725 MHz, the result is

d = 209,866 miles

Thus, using the flat earth (K = infinity) assumption would suggest that a TV channel will propagate many times around the earth, thereby allowing only one TV station to operate at this channel assignment worldwide. Clearly, this is inconsistent with

the common practice of reusing television channel frequencies spaced only a few hundred miles apart.

Therefore, Line of Site interference calculations using the flat earth assumption are unrealistically pessimistic, and, as can be seen, if applied to broadcast television would preclude ever reusing channel frequencies worldwide. How then can we rely upon these equations for point-to-multipoint interference?

APPENDIX B

Example of Point-to-point Coexistence with Point-to-Multipoint operation.

It is generally accepted that an earth station has the potential for causing the greatest interference to nearby terrestrial facilities along the horizontal direction relative to its antenna. Section 25.204 of the FCC Rules and Regulations states that within the band 5925 to 6424 MHz, the mean effective radiated power transmitted in any direction in the horizontal plane by an earth station shall not exceed +40 dBW in any 4 KHz band at the horizon.

The Suite 12 radiated power in the horizontal direction is only -4 dBW in a 18 MHz band (-41.5 dBW in a 4 KHz band). This is 81.5 dB below customary FCC rules for the 6 GHz band.

If one were to apply a C/I = 25 dB, the nearest distance a point-to-point 6 GHz system could operate from a satellite earth station would be 9.8 million (!) miles, as the calculation below shows. Clearly, this situation, too, is inconsistent with common practice. In addition, even with a C/I of 0 dB, a strict application of interference formulas would suggest that point-to-multipoint could not share the same band, within 552,300 miles, yet, as a practical matter they do.

The interference distance is determined according to the following calculation.

Transmission Frequency, F.	6 GHz
EIRP (in horizontal plane)	+40 dBW (+70 dBm)
MDS of receiver (4 kHz bandwidth, NF=6 dB, CNR 13 dB)	-119 dBm
Receiver antenna gain:	38 dB
Assumed necessary C/I ratio:	25 dB

Using these values, the necessary free space loss (FSL) is then calculated to be

FSL = EIRP + G(rec) - MDS + C/I
= 70 dBm + 38 dB -(-119 dBm) + 25 dB
= 252 dB (required space loss to avoid interference)

Solving the distance formula to determine the separation of transmitters necessary to avoid interference under this assumed set of conditions gives,

FSL = 36.58 + 20 log(F) + 20 log(d)
252 dB = 36.58 + 20 log(6000) + 20 log(d)

d = 9,851,416 miles

Here using the same basic equations for interference indicates that earth stations at 6 GHz cannot coexist with point-to-point radio links anywhere on earth.

Suite 12/rge:94:19

Aggregate Effective Radiated Flux as Function of Cell Size

Take a square cell of side c. Place an omni-directional transmitter in the middle of the cell with EIRP of P_2. The maximum distance that the EM wave has to travel is half the cell's diagonal, $c/\sqrt{2}$. The received flux at the edge is, therefore, proportional to $\frac{2P_2}{c^2}$. If there is rain, and the attenuation in nepers per unit distance is α, then the flux will be $\frac{2P_2}{c^2}e^{-\alpha c/\sqrt{2}}$

Now instead of having cells of side c let us have larger cells of size Nc, where N is an integer, and a central hub with $EIRP$ of P_1. The maximum distance from the center of the large cell is $Nc/\sqrt{2}$, and the flux is $\frac{2P_1}{N^2c^2}$. When rain is taken into account the flux at the farthest point will be $\frac{2P_1}{N^2c^2}e^{-\alpha Nc/\sqrt{2}}$.

To achieve the same quality of service the two fluxes, one for the small cell and the other for the large cell case, must equal: $\frac{2P_2}{c^2}e^{-\alpha c/\sqrt{2}} = \frac{2P_1}{N^2c^2}e^{-\alpha Nc/\sqrt{2}}$.

After rearrangement we get

$$R = \frac{N^2P_2}{P_1} = \exp\left[-\alpha(N-1)\frac{c}{\sqrt{2}}\right].$$

Since one could place N^2 small cells of side c each in the large cell, to cover the same area with the small cells the total power radiated will be N^2P_2. The ratio R that is always less than 1, therefore, represents what fraction of the power for the large cell hub is enough to cover the same area with small cells. One can conveniently express the reduction in dB units as $10\log(R) = \left[-\alpha(N-1)\frac{c}{\sqrt{2}}\right]10\log(e) = -\alpha'(N-1)\frac{c}{\sqrt{2}}$

where α' is the attenuation in dB/km.

For example, when α = 2.7 dB/km, c = 1.6 km and N = 3, then R = - 7.6 dB.

When there is no rain, $\alpha = 0$, the ratio $R = \frac{N^2 P_c}{P_1} = \exp\left[-\alpha(N-1)\frac{c}{\sqrt{2}}\right]$ is, of course, equal to 1, in other words having smaller or larger cells have *no effect* on the aggregate radiated power. Only when there is rain have the smaller cells advantage over the larger cells by having to radiate less aggregate power.

Sector Antennas and Composite Omni-Directional Gain

1. Gain and Aperture Size

By the formula of Friis the relationship between the directivity (lossless gain) of an antenna and its aperture area is $G = \frac{4\pi}{\lambda^2} A_{eff}$, where A_{eff} is the effective antenna aperture area, and λ is the free space wave length. For a fixed wave length the directivity, therefore, depends only on the aperture size.

One could express the directivity in another way by using the energy conservation principle. If the antenna focuses all its energy into a solid angle of widths θ_{Az} and θ_{El} then the directivity of is $G = \eta \frac{4\pi}{\theta_{Az}\theta_{El}}$, where η is the efficiency representing the fraction of the energy radiated in the side lobes. In this expression the azimuth and elevation angles are measured in radians. The main beam is radiated into a solid angle of size $\theta_{Az} \cdot \theta_{El}$ steradians. The efficiency η is the ratio of the effective aperture area to the actual geometric area.

Now equate the two expressions for the directivity and get the effective aperture area $A_{eff} = \eta \frac{\lambda^2}{\theta_{Az}\theta_{El}}$. Hence, the required *geometric* size of the aperture is approximately

$A_0 = \frac{A_{eff}}{\eta} = \frac{\lambda^2}{\theta_{Az}\theta_{El}}$ and this depends only on the beam width and wave length.

If one were to use an omni-directional antenna for which $\theta_{Az} = 2\pi$, then the directivity will be $G = \eta \frac{2}{\theta_{El}}$. Note that G depends only on the elevation beam width.

2. Sector Antennas

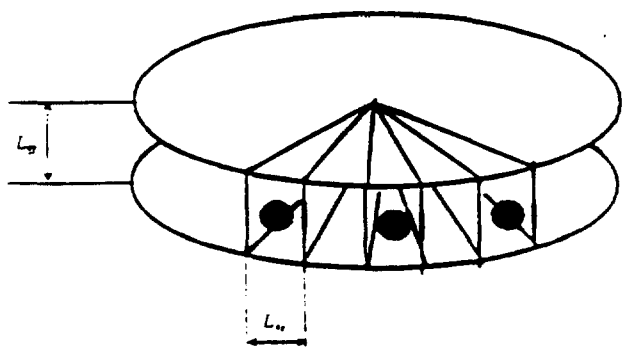
Let us place N identical sector antennas, each of beam widths θ_{Az} and θ_{El}, along the circumference of a circle in the azimuth plane, where $N = \frac{2\pi}{\theta_{Az}}$. The resulting beam pattern

will be omni-directional in the azimuth plane if the N beams are side by side. For simplicity's sake assume that the apertures are rectangular and each antenna has size

$$A_{ae} = \frac{A_{ae}}{\eta} = \frac{\lambda^2}{\theta_{Az}\theta_{El}} = L_{Az}L_{El} \text{ with directivity } G = \eta\frac{4\pi}{\theta_{Az}\theta_{El}}$$

The confusion that a set of sectoral horns would result in a composite gain higher than that of an omni-directional antenna comes from the erroneous assumption that the radius of such circular arrangement is $R = \frac{NL_{Az}}{2\pi}$. This assumption is *wrong* because the larger θ_{Az} the smaller the aperture width L_{Az} is, in fact, there is a reciprocal relationship between them: $\theta_{Az} = \frac{\lambda}{L_{Az}}$. Therefore, one cannot place so many horns without having the beams overlapping in such a small radius. If one were to place the horns in a circle of radius $R = \frac{NL_{Az}}{2\pi}$ then the beams would overlap many fold.

The total aperture area of a circular arrangement of sectoral horns such that the beams cover the azimuthal plane *singly* and *omni-directionally* is just the same as the gain of any of the horns. Here the assumption that the coverage is single and not multiple is important. The comparison with the case of multiple beam coverage is, of course, not fair as that case is equivalent to several transmitters beaming at the same spot.



Again, one could invoke the energy conservation principle to support this argument. Assume a single transmitter driving either an omni-directional antenna or a circular arrangement of sectoral horns such that the composite distribution is the same as that of the omni-directional one. The composite gain, if uniform in azimuth, then must be the same as the single horn gain, because both must deliver the *same energy to the same spot*. Thus the EIRPs for the two cases are the same, as well.

NRMC/ 104
September 23, 1994

Comments Concerning Earth Station to LMDS Interference Predictions

By Geza Dienes, Andrew Corp.

One of the most important assumptions governing the outcome of interference calculations performed by Working Group 1 is the antenna pattern envelope of the interfering and interfered antennas. For example, the calculations presented in NRMC-98 indicate significant, indeed intolerable levels of interference from the Teledesic System into an LMDS system. These calculations were based on, among other factors, the subscriber antenna masks as presented in NRMC-98 and the TST and TGT antenna masks as indicated in NRMC-88.

It appears that considerable interference mitigation would be achieved if the radiation levels of the TST and TGT antennas could be lowered in the 40 - 90 degree angular range. Further improvement may also be realized by improving the subscriber antenna masks.

Comparing the uplink satellite antenna masks used for the calculation with a mask that would be achieved on a well designed aperture, we find that the theoretical improvement approaches 38 - 45 dB. On a phased array the improvement may be limited to 20 - 25 dB. The improvement is needed only in the transmit band, so some tradeoff is possible in performance of the antenna between the transmit and receive frequencies.

A table of the antenna mask used in the interference calculations and the masks which could be achieved are shown below.

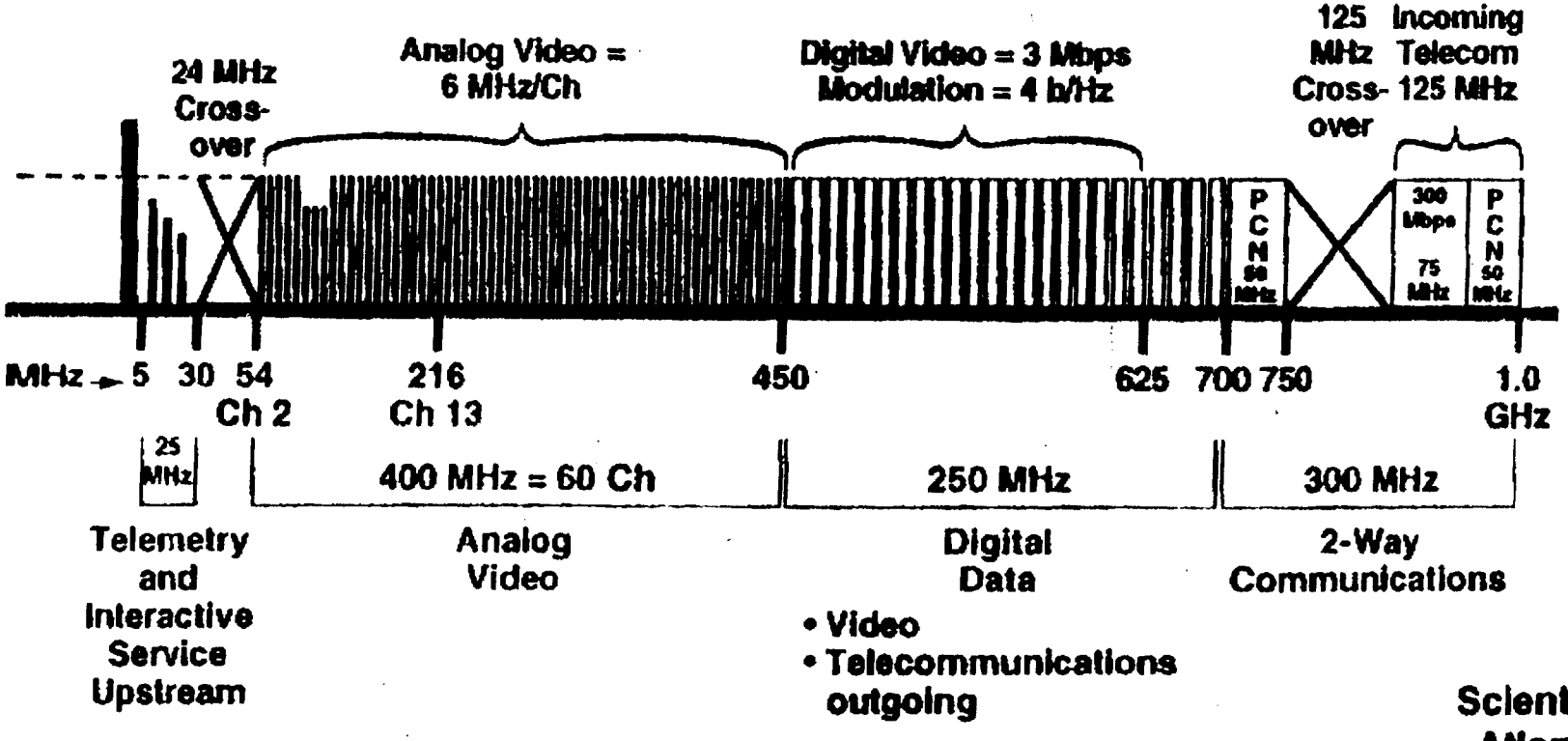
Off axis angle Deg	Gain fall off used dB	Gain fall off possible dB	Improvement dB
30	-35	-58	23
40	-38	-63	25
50	-40	-65	25
60	-40	-65	25
70	-40	-65	25
80	-40	-65	25
90	-40	-65	25

It is apparent that 25 dB improvement results in an 18 to 1 reduction in the interference range.

SUITE 12 GROUP

SEPTEMBER 23, 1994

The Full Service Network
Coaxial Telecommunications Spectrum



Scientific Atlanta

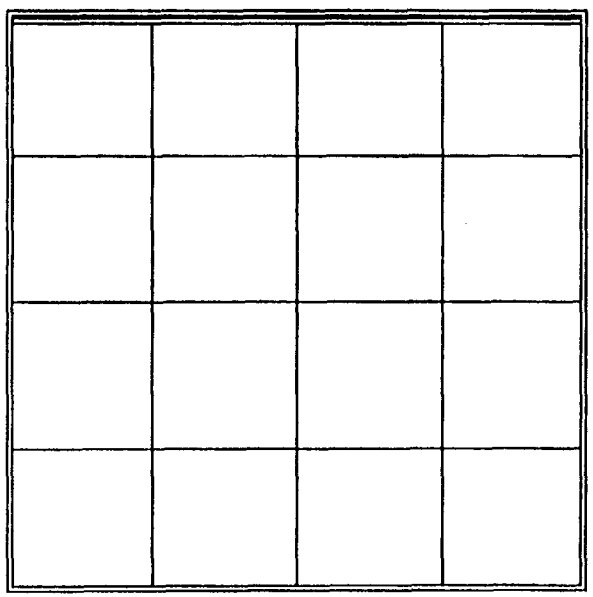
"What-if" types of computer simulation can identify system parameters and operating conditions that permit co-frequency sharing.

Free space line-of-sight equations are misleading when used to calculate FSS interference into LMDS receivers located in expected operating environments. (WG1/89)

Given a narrow beamwidth LMDS receive antenna, both direct and reflected interference sources are unlikely to occur in its main beam.

EIRP = K (NRMC/92.3)

The amount of power required to reach a given coverage area is a constant.



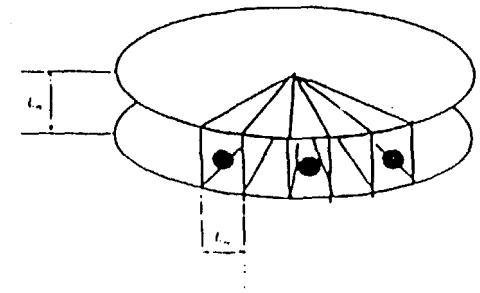
16 cells of X power

equals

1 cell of 16X power

Required C/(N+I) for acceptable system performance for FM and digital QPSK systems are similar.

The use of composite sector antennas to provide omni-directional coverage:



(1) can easily be designed to exhibit the same elevation pattern as omni-directional antennas. (NRMC 92.2)

(2) allows for reduced transmitter power equal to the increase in gain between a single sector and an omni-directional antenna with the same elevation pattern. Hence, EIRP remains constant.

If one LMDS system can be designed so that it does not interfere with satellite receivers, <u>all</u> others can also be designed to avoid interference into satellite receivers. (WG1/107.3)

Mitigation factors in conjunction with operational techniques can solve the co-frequency sharing problem:

* improved satellite antenna sidelobes (NRMC/104)

* Suite 12 "Plan A" (subdivision of satellite footprint via frequency agile FSS transmitters) (NRMC/92)

* Suite 12 "Plan B" (spoke and hub) (NRMC/92)

ADDENDUM OF TELEDESIC CORPORATION

Teledesic Corporation ("Teledesic") hereby comments on the recommendations and conclusions considered for adoption and incorporation into the Negotiated Rulemaking Committee Report ("Committee Report") at the final meeting of the Negotiated Rulemaking Committee ("Committee") on September 23, 1994. The Federal Communications Commission ("Commission" or "FCC") is attempting to identify appropriate spectrum for mobile satellite service ("MSS") feeder links. In order to assist the Commission in evaluating this question, Working Group 2 developed the following conclusion for adoption by the Committee:

> [C]o-frequency sharing of the 27.5 - 29.5 GHz band between LMDS operators and Non-GSO MSS feeder links is possible. It is noted that during this proceeding, only one Non-GSO MSS applicant definitely indicated an intent to establish feeder links in this part of the spectrum.

FSS/MSS 28 GHz NRM Committee Recommendations and Conclusions Developed from the Report of Working Group 2, NRMC-108 (Sept. 23, 1994).

Consideration of any frequency band for MSS feeder link use must take into account all relevant factors. In addressing co-frequency sharing at 27.5 - 29.5 GHz, the Committee, by its charter, considered only the sharing possibilities between local multipoint distribution systems ("LMDS") and principally one MSS system that had proposed to locate feeder links in that band. The Committee did not address whether more than one MSS operator can use the same frequencies at the same time for feeder links. Additionally, the Committee did not examine (at any level) the question of co-frequency sharing between the fixed satellite service ("FSS") and non-geostationary ("Non-GSO") MSS feeder links in the 27.5 - 29.5 GHz band. For these reasons, Teledesic could not support the proposed conclusion without additional qualifying statements to place the conclusion in proper context.

In an attempt to properly qualify the conclusion, Hughes Space and Communications Company and Hughes Communications Galaxy, Inc. (collectively, "Hughes") submitted proposed text for consideration by the Committee. See Hughes, Proposed Text for NRMC and Working Group 2 Reports, NRMC-102 (Sept. 21, 1994) ("Hughes Text"). Teledesic supported adoption by the Committee of the basic principles set forth in the Hughes Text. The Hughes Text included the statement that neither the Committee nor Working Group 2 addressed whether FSS and Non-GSO MSS feeder links could share the use of the 27.5 - 29.5 GHz band on a co-frequency basis. It also included the statement that neither the Committee nor Working Group 2 addressed whether more than one MSS operator can use the same frequency for feeder links. Teledesic also supported adding a statement to the Committee Report from the Hughes Text indicating that the Committee did not examine how the adoption of rules or recommendations concerning LMDS and MSS sharing would affect the ability of the FSS to use the 27.5 - 29.5 GHz band.

Several parties objected to the Hughes' Text. In an effort to reach consensus on the adoption by the Committee of the Working Group 2 conclusion on sharing between LMDS operations and Non-GSO MSS feeder links, Teledesic suggested and supported certain deletions and modifications to portions of the Hughes Text to which there were objections in an attempt to negotiate an acceptable compromise. The negotiations occurred during the waning minutes of the Committee's final meeting and there was not sufficient time to negotiate changes that were acceptable to all members of the Committee. As a result, the members of the Committee were unable to reach a consensus on the compromise language, and the Working Group 2 conclusion on co-frequency sharing between LMDS operators and Non-GSO MSS feeder links was not adopted by consensus.

STATEMENT OF TRW INC.

In May 1991, TRW Inc. ("TRW") applied for authority to establish a Non-Geostationary Mobile Satellite Service ("Non-GSO MSS") system that would have its primary service links in the 1610-1626.5 MHz and 2483.5-2500 MHz bands, and its feeder links in the 29.5-30.0 GHz and 19.7-20.2 GHz bands. The Commission has allocated spectrum for the Non-GSO MSS in the primary service bands, and, later this year, is expected to conclude its rulemaking proceeding in CC Docket No. 92-166, whereby it would establish technical and service rules for the Non-GSO MSS and pave the way for the licensing of systems in the processing group of which TRW is part. The frequency bands at 29.5-30.0 GHz and 19.7-20.2 GHz are allocated to the Fixed-Satellite Service ("FSS") and the MSS on a co-primary basis, and the use of FSS bands is permitted for MSS feeder links.

In its notice of proposed rule making in CC Docket No. 92-166, the Commission stated that it expected to be able to find feeder link spectrum in the 27.5-30.0 GHz band for all five of the Non-GSO MSS applicants in TRW's processing group. The Commission also noted that it was preparing to conduct a negotiated rulemaking proceeding to resolve technical sharing issues between satellite services and the proposed terrestrial Local Multipoint Distribution Service ("LMDS") in the 27.5-29.5 GHz band that was proposed in 1992 for assignment to the LMDS. All five of the Non-GSO MSS applicants were subsequently identified by the Commission as parties in interest in the negotiated rulemaking proceeding, even though only one -- Motorola Satellite Communications, Inc. ("Motorola") -- had a pending proposal to use spectrum at 27.5-29.5 GHz.

When TRW filed its MSS Above 1 GHz application, only one geostationary FSS system had been authorized to use the band, and no other 27.5-29.5 GHz band satellite applications were pending (other than the non-mutually exclusive feeder link proposal of Motorola). Since 1991, however, the Commission has proposed to assign up to two gigahertz of the 27.5-30.0 GHz band to the terrestrial LMDS service on a co-primary basis -- and presented a somewhat bleak, albeit preliminary, assessment of the prospects for spectrum sharing between satellite and LMDS users.[*/] In addition, in December 1993, Hughes Communications Galaxy, Inc. ("Hughes") applied for a geostationary

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[*/] See Rulemaking to Amend Part 1 and Part 21 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band and to Establish Rules and Policies for the Local Multipoint Distribution Service, 8 FCC Rcd 557, 560 (1993) ("the multicell multipoint configurations in this proposal envision a wide area distribution of services which may foreclose the possibility of acceptable sharing conditions between satellite and terrestrial services").

satellite system that would operate both in the upper 500 megahertz of the proposed LMDS allocation and in the 500 megahertz at 29.5-30.0 GHz in which TRW would locate the feeder links for its proposed MSS Above 1 GHz system. These occurrences, plus the prospect of additional potentially conflicting satellite applications and the Commission's expectation that it may have to accommodate up to three more Non-GSO MSS feeder link proposals at 27.5-30.0 GHz, mean that the sharing environment for the 27.5-30.0 GHz band -- and by implication for the companion satellite band at 17.7-20.2 GHz -- has become increasingly complicated in the years following the submission of compatible feeder link proposals by TRW and Motorola.

TRW participated actively as a member of the LMDS/FSS 28 GHz Band Negotiated Rulemaking Committee, and endeavored to help forge a consensus. It now emphasizes that the inability of the Committee to reach consensus on critical LMDS/satellite sharing issues at 27.5-29.5 GHz, though unfortunate, should in no way impede or delay the licensing of TRW's Non-GSO MSS system. There simply is no overlap in frequency bands between the proposed LMDS service at 27.5-29.5 GHz and TRW's proposal to use spectrum above 29.5 GHz for its feeder link operations.

On a related point, TRW strongly disagrees with the suggestion of some members of the Committee that alleged issues regarding the ability of recently-applied for FSS systems to share spectrum with the long-pending Non-GSO MSS proposals of TRW and Motorola must be resolved before any licenses can be issued either to LMDS systems or to Non-GSO MSS systems. Non-GSO MSS/FSS sharing issues, to the extent they may even exist, were not analyzed at all by the Committee or its working groups, and there is no record basis whatsoever before the Commission now to suggest that co-frequency sharing can or cannot occur. Moreover, there are other procedural and substantive matters that would have to be considered before a technical analysis would even need to be undertaken.

In short, TRW applied more than three years ago for feeder links in what was an uncongested frequency band. After a tremendous amount of effort and expense, TRW has managed to place itself in a situation where the final barriers to the licensing of its Non-GSO MSS system are about to be lifted. The Commission should not delay licensing TRW to use spectrum in the 29.5-30.0 GHz band for its Non-GSO MSS feeder link operations -- either during the pendency of the LMDS rulemaking proceeding at 27.5-29.5 GHz or for matters related to any not-yet-filed or not-yet-accepted-for-filing applications for an FSS system at 29.0-30.0 GHz.

September 29, 1994

ADDENDUM OF VIDEO/PHONE SYSTEMS, INC.

I. Introduction

Video/Phone Systems, Inc. ("Video/Phone"), through its undersigned counsel, hereby submits the following addendum for inclusion in the final report of the 28 GHz LMDS/FSS Negotiated Rulemaking Committee ("28 GHz NRMC"). Despite the fact that the 28 GHz NRMC failed to reach consensus on the major issues before it, Video/Phone believes that the effort can still be characterized as a success. Analyses concluded that proposed LMDS system designs can be deployed without causing unacceptable interference into FSS service link spacecraft receivers. In addition, analyses demonstrated that co-frequency sharing between LMDS and Non-GSO MSS feederlink systems is feasible. Unfortunately, time did permit the Committee to finalize consensus rule provision reflecting these conclusions. The record developed by the 28 GHz NRMC represents the culmination of thousands of person-hours of expert technical and policy analysis. At a minimum, the work of the 28 GHz NRMC has accelerated the LMDS rulemaking process by at least a year.

Given the substantial progress accomplished by the 28 GHz NRMC, Video/Phone urges the Commission to encourage the interested parties to continue to explore the formulation of service rule structures to facilitate co-frequency co-primary LMDS/FSS use of the 28 GHz band. In order not to impede the process of continued negotiations, Video/Phone also urges the

Commission to refrain for 120 days from the expiration of the 28 GHz NRMC charter from taking any further action in the LMDS Rulemaking proceeding.

II. The 28 GHz NRMC Established A Firm Foundation For the Adoption of Rules to Preclude Unacceptable Interference Into FSS Satellite Receivers From LMDS Operations

A. LMDS Into FSS Service Link Spacecraft Receivers

Interference analyses submitted to NRMC Working Group 1B of the 28 GHz NRMC indicate that it is possible to configure the proposed LMDS system designs considered by the Working Group so as to avoid incidences of unacceptable interference into FSS service link spacecraft receivers from LMDS operations. Based on these analyses and subsequent Working Group 1B efforts, Video/Phone believes that Working Group 1B demonstrated that there is a sound technical basis for the formulation of a service rule structure that will preclude unacceptable interference into FSS service link systems from LMDS operations.

Unfortunately, there was not enough time for Working Group 1 to agree upon a mutually acceptable set of service rules to address this potential interference path. There is, however, a substantial amount of information in the NRMC record to support formulation of an appropriate power spectral density limit rule structure and an accompanying LMDS applicant/licensee compliance

provision to ensure that the resulting rules will afford a reasonable assurance of protection to FSS service link licensees. See NRMC Document No. 103, "Working Group 1B Rule Issues", (submitted September 22, 1994). Video/Phone will continue to support efforts to develop a practical rule structure to limit LMDS operations to afford appropriate protection to FSS service link operations.

B. LMDS Into Non-GSO MSS Feederlink Spacecraft Receivers

Video/Phone commends Motorola, Suite 12 and all the other Working Group 2 participants that contributed substantial time and expertise in an effort to develop a viable rule structure to preclude unacceptable interference into Non-GSO MSS feederlink spacecraft receivers from LMDS operations. Video/Phone agrees with the view that a structure of LMDS power spectral density limits is necessary to protect Non-GSO MSS feederlink spacecraft receivers from short and long term incidences of unacceptable interference from LMDS operations.

1. Aggregate Power Spectral Density Limits

Video/Phone agrees with the structure set forth in the joint Suite 12/Motorola proposed rule Sections 21.1020 & 21.1021 for limiting aggregate LMDS emissions at the horizon, and as a

function of elevation angle. Video/Phone does not concur, however, with the aggregate power density limit values designated in the Suite 12/Motorola proposed rule at Section 21.1020, Table 1. As Video/Phone explained in detail on several occasions during the Working Group 2 deliberations, the power limits proposed by Suite 12 and Motorola would unduly encumber LMDS operations on a nationwide basis by limiting possible LMDS deployments in spectrum made available for Non-GSO MSS feederlink operations to low-power, low-capacity LMDS systems. This result is particularly unacceptable to Video/Phone due to the open question of how much spectrum in the 27.5 - 29.5 GHz band might ultimately be allotted for Non-GSO MSS feederlink operations.

Video/Phone readily realizes that some encumbering (i.e., power spectral density reduction) of LMDS operations will be necessary to preclude unacceptable interference into co-frequency Non-GEO MSS feederlink operations. Video/Phone does not support the approach taken in the development of the Suite/12 Motorola rule proposal whereby LMDS assumes the entire burden.

As Video/Phone indicated during the Working Group 2 deliberations, increasing the transmit EIRP of proposed Non-GSO MSS feederlink earth stations is a simple and practical way of equitably spreading the burden of co-frequency LMDS/Non-GSO MSS feederlink sharing. The cost impact of raising earth station transmit power on Non-GSO MSS feederlink operators should be minimal in the scheme of total system costs. Furthermore, the