Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Redesignation of the 17.7-19.7 GHz Frequency	)	IB Docket No. 98-172
Band, Blanket Licensing of Satellite Earth	)	RM - 9005
Stations in the 17.2-20.2 GHz and 27.5-30.0	)	
GHz Frequency Bands, and the Allocation of	)	RM-9118
Additional Spectrum in the 17.3-17.8 GHz and	)	FCC 02-317
24.75-25.25 GHz Frequency Bands for	)	Second Order on
Broadcast Satellite -Service Use	)	Reconsideration

Petition For Reconsideration and Emergency Request For Immediate Relief

The Independent MultiFamily
Communications Council (IMCC)
(formerly ICTA)

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Summary

This Petition for Reconsideration and Request for Emergency Relief addresses FCC 02-317, Second Order on Reconsideration.

The Independent MultiFamily Communications Council (IMCC, association) is a trade association comprised of Private Cable Operators (PCOs), formerly known at SMATV operators, multiple dwelling unit (MDU) owners and the supporting industry, such as manufacturers of equipment used by PCOs. PCOs only serve MDU buildings and residents and provide analog and digital video services, high-speed data services and, in a few instances, telephony services. PCOs compete directly with franchised cable companies (MSOs) in the numerous MDU environments. PCOs serve many hundreds of thousands of MDU residents, nationwide as much as 5% of all residents in communities larger than 100 units. The vast majority of PCO microwave links are and will be located in major urban markets where a large number of MDUs are located. (see Engineering Analysis prepared by Hardin and Associates, Inc, attached, page 4) Many of these residents receive their service from PCOs utilizing microwave transmission in the 18.142-18.58 GHz portion of the radio spectrum. Without the use of microwave transmission, the ability of PCOs to compete with MSOs will be diminished and the rates charged to residents will necessarily be increased because the cost of providing service will go up.

The FCC has repeatedly recognized that PCOs, SMATV operators, offer meaningful competition to MSOs, franchised cable. For instance, the Ninth Annual Report on Video Competition (see 02-338) states that, "As of 2002, PCO subscribership increased by 100,000 subscribers, reaching 1.6 million subscribers, 1.7% of the MVPD market." This would mean a much higher percentage of MDU television households.

The FCC Second Order on Reconsideration, FCC 02-317, includes two primary decisions about which IMCC and its members are most concerned. They are that PCOs, over time, must vacate the spectrum from 18.3-18.58 GHz and that all new applications for use of this spectrum by PCOs have been terminated, including negative effects on modifications to existing microwave systems. We believe these decisions are based on seriously flawed assumptions and analyses and that the decisions

do not accomplish the intended goals and that the impact of these decisions will reduce video competition nationwide for many thousands of MDU residents.

IMCC is aware of the assertions by companies, primarily Hughes Electronics Corporation (Hughes), that the FCC decisions are needed to allow for the deployment of a nationwide electronic data distribution system, the details of which have not been made public. Apparently, the plans of Hughes are to deploy non-governmental Fixed Satellite Service (FSS) to a multitude of ubiquitously deployed earth stations. It is the view of IMCC that the FCC decisions, due to the flaws inherent in the FCC technical analysis, will not provide the benefits sought by Hughes, and will be expensive for them to implement. It also is IMCC's view that some of the problems caused by the Second Order can be diminished if reasonable accommodations are made by the FCC.

Because most of the currently relevant issues are repetitious of issues addressed and decided by the FCC in 1999 and as recently as October 31, 2001, more complete views regarding these matters can be found in previously filed comments by this association on November 5, 1998 and November 19, 1998.

I. History of FCC Actions Regarding Microwave Video Transmission by PCOs to MDUs

a. Congressional Mandate to Enhance Video Competition

It is clear from several statutory enactments that the United States Congress has directed the FCC to adopt regulations and take other actions to enhance competition in the delivery of video services in the United States. The FCC has taken some such actions so that alternative video providers, such as PCOs, are better able to compete with MSOs, specifically in the numerous MDU environments.

b. FCC Opens 18.142-18.58 GHz to Private Cable Operator (SMATV) Use

One such regulatory action was taken by the FCC in 1991 to open the 18 GHz band for PCO use to "encourage competition in the video distribution marketplace." (See 6 FCC Rcd 1270 (1991)). An essential element of this action was to grant this spectrum utilization as a contiguous block of 442 MHz. Without this spectrum being contiguous, PCOs could not provide the number of channels needed to compete with MSOs and to satisfy resident demand. This action allowed PCOs to utilize, on a co-primary basis, the spectrum from 18.142-18.58 GHz. This action had immediate and tangible positive effects. This was so because PCOs utilized this spectrum and began service to many more MDU buildings and residents, at costs lower than had PCOs had to install head-ends at all such buildings. This made PCO service more attractive to MDU owners, and consequently MDU residents, which resulted in PCOs being more competitive with MSOs; thereby, helping to accomplish the Congressional mandate to enhance video competition.

c. ***Impact of 1998 Redesignation NPRM Including "Cut Off Proposal"; Request for Emergency Relief***

In September of 1998, the FCC released IB Docket No. 98-172, the 18 GHz Redesignation NPRM. It proposed splitting the spectrum available to PCOs, eliminating the PCO co-primary status and it included a provision that cut off, on the date of the release of the NMRM, any further applications for licenses by PCOs. In our organization's filing on November

5, 1998, in opposition to the NPRM, it was made clear that splitting the spectrum would render the microwave transmission by PCOs virtually useless and the goals accomplished by the 1991 Order would be lost. A lengthy and detailed technical analysis by Hardin and Associates was attached to the filing. In addition, the organization filed an Emergency Request for Immediate Relief. It made clear that the cut off, as of the date of the issuance of the NPRM, had stopped all development of projects that PCOs had in process but for which licenses had not yet been approved by the FCC. This obviously had a deleterious effect on competition with MSOs. The content and impact of the Second Order on Reconsideration considers the same issues and adopts conclusions just as damaging to PCOs, MDU residents and video competition. PCOs simply cannot maintain a competitive position viz a viz MSOs if the decisions of the Second Order are maintained.

d. FCC Urges Parties to Negotiate

As to the larger issues addressed in the NPRM, namely not preserving the contiguous 450 MHz required for PCOs to compete effectively with franchised cable, the Chairman of the FCC urged that the association negotiate with Hughes and other such companies to endeavor to find a compromise for the allocation of spectrum. Many meetings were held. Most of Hughes' competitors were open to meaningful discussions, negotiated in good faith and offered compromises, as did the association. Hughes was not forthcoming, rejected all compromise ideas and said they would accept nothing less than the total amount of spectrum they desired. Consequently, the negotiations failed. The Telecommunications Industry Association also held lengthy discussions that produced a compromise proposal. It also was rejected by Hughes that led to abandonment of the effort due to the size of and industry leverage exercised by Hughes.

e. FCC Grants Emergency Relief and Rational

On February 5, 1999, the FCC, in FCC 99-18, granted the association's prayer for Relief for the following reasons: (see primarily paragraphs 4 and 11)

1. The cut off of co-primary status for PCOs as included in the NPRM would have "immediate negative effects."
2. Removing part of the contiguous 450 MHz would render virtually useless all of the spectrum needed by PCOs to deliver their video products.

3. 17.7-18.14 is not in reality available for PCOs because it is unchannelized.
4. That space is not vendor supported for PCOs.
5. 18.14-18.3 cannot absorb PCO needs because of existing congestion.
6. There is no other spectrum available for PCOs to use to serve the MDU resident market.
7. All the above would militate against "…our (FCC) expressed goal of increased competition in the provision of new video services."
8. "…lack of new spectrum for PCOs could undermine the existing investment that was made by PCOs…"
9. There are a "relatively small number of PCO applications".

As will be made clear below regarding the FCC decisions in the Second Order on Reconsideration, the above FCC adopted reasons for not eviscerating PCO microwave transmission are still applicable.

f. FCC Maintains Contiguous 442 MHz for Private Cable Operators

On June 8, 2000, the FCC adopted a Report and Order, FCC 00-212, in which it agreed with the association's point of view and allowed PCOs to maintain the 450 MHz of contiguous spectrum, 18.142-18.58. The R&O, at paragraph 41, said the following:

> "…we conclude the following: 1) PCOs using the 18 GHz band, for both <u>current and future</u> operations, will not be able to compete effectively against franchised cable operators if we redesignate the 18.3-18.55 GHz band…" (emphasis added). Consequently, PCOs were allowed to continue use of the contiguous space to enhance video competition.

g. FCC Grants Optel-Lower CARS Band Petition

In November of 2001, Optel, the largest PCO, requested the FCC to allow PCOs and other MVPDs to also utilize the lower 12 GHz CARS band, a spectrum space already available to MSOs, franchised cable. Optel, and the association, argued for this utilization as a matter of equity among video providers. It was argued that this space might already be congested, but that in order to balance the opportunities among providers that this should be done. Optel, and the association, made it abundantly clear, repeatedly, that such a granting by the FCC was not a <u>supplanting</u> of the contiguous18.142-18.58 GHz spectrum, but merely a <u>supplement</u> to that space. On May 21, 2002, the FCC granted this request in FCC 02-149. However, the FCC Order included neither any technical analysis of its implementation feasibility nor did it cite any congestion analysis. It is the view of

IMCC that few PCOs can realistically use this spectrum due to existing congestion, primarily caused by MSO use of this spectrum.

h. FCC Issues 2002 Second Order on Reconsideration

On November 26, 2002, the FCC released the Second Order on Reconsideration, FCC 02-317.

II. Impact of Second Order on Reconsideration

If PCOs are to compete with MSOs, it is essential for PCOs to have, at a minimum, 440 MHz of contiguous spectrum. If this is not the case PCOs will not be able to transmit the number of channels comparable to MSOs. The spectrum from 18.142-18.3 would optimally only allow for 26 channels as opposed to the current number of 70 channels. As will be demonstrated below, the lower CARS and upper CARS bands will not provide adequate spectrum due to the congestion that already exists in those bands.

It should also be noted that for PCOs, secondary status means no status at all in a blanket-licensing regime. This is because PCO service cannot avoid causing interference to potentially thousands of ubiquitously deployed earth station receivers contemplated by Hughes and other such companies.

a. *Contents of and Impact on Video Competition*

This Order, FCC 02-317, grants to Hughes all the spectrum it wanted. It also makes it impossible for PCOs to continue, let alone expand, their ability to provide video service to MDU residents, for which there is considerable demand. The Order thereby reduces video competition in contradistinction to Congressional directives and previously and frequently stated FCC intention.

Beyond that, the Order includes a freeze on PCO applications for new licenses, makes the attainment of permissible waivers for modifications to existing microwave systems highly questionable and threatens the considerable investment in these systems already made by PCOs. All of which is virtually identical to the impact that the FCC rejected when it granted the association's Emergency Request for Immediate Relief in February of 1999.

b. FCC Rationale and Justification

The Order's rationale and justification for its decisions are based on the assertions that alternative spectrum, the lower CARS band from 12.7-13.2 GHz, has been made available to PCO use and that additional spectrum, the upper CARS band from 17.7-18.142, will also now be available for PCO use. Of critical importance is that the Order bases its conclusions on studies or analyses performed by the Office of Engineering Technology (OET) which assert that this alternative, collective spectrum should adequately accommodate PCO demand.

c. Flaws in Rationale and Justification

The Second Order essentially asserts that PCOs will be forced to vacate the 18.3-18.58 spectrum and that no new licenses or major modifications will be granted, but that PCOs will be accommodated in the lower and the upper CARS bands. IMCC finds numerous flaws in this rationale and justification. These flaws include the following:

1. Lower CARS Band Heavily Congested

As was said above, when the Optel 12 GHz petition was granted, the Media Bureau did not include any technical analysis to demonstrate that this spectrum is, in reality, usable by PCOs. There is evidence this spectrum is of minimal potential utilization value for PCOs because there is already much congestion in that part of the band, primarily by MSOs, particularly in urban areas where PCOs have the vast majority of their microwave links.

2. 17.7-18.14 Poor Substitute

As to the 17.7-18.14 GHz space, that space is currently not channelized (although we understand the FCC is working on that matter) and there are presently no manufacturers producing the equipment needed for PCOs to utilize this spectrum. Even if the equipment was available, PCOs would be required to acquire FCC approval for this new use, to build parallel and duplicate transmitters for already developed network hubs and to conduct tests to assure reliability, all of which take considerable time and would be expensive to accomplish.

Also, this band segment is a poor substitute because it is used by a panoply of fixed terrestrial providers, including electric, gas and water utilities, public safety agencies, traffic control systems, railroad companies and broadcast stations. Again, this becomes particularly troublesome in urban areas where PCOs primarily operate, as well as the above mentioned users.

3. 18.14-18.3 Alone is Not Meaningful

To be competitive with MSOs, PCOs must be able to offer up to 70 channels of cable programming. Indeed, PCOs are often obligated by their contracts with MDU owners to provide as much programming as MSOs provide. To fulfill this obligation PCOs need at least 440 MHz of contiguous spectrum. Thus, the 160 MHz from 18.14-18.3 GHz is virtually useless without at least another 280 MHz of workable, contiguous spectrum that is not already highly congested.

4. Comsearch Study of 18.14 – 18.3

Comsearch performed an interference study of 10 actual PCO links in that space. The study is dated February 5, 2003, and is attached. "The purpose of this study is to examine the availability of (that band) for multi-channel AML video systems by performing an interference analysis on a representative set of ten paths using the same parameters presently licensed in the 18.14-18.58 GHz segment." The study addressed two primary questions. Is a contiguous 280 MHz segment generally available to replace the 280 MHz for which co-primary status was removed from PCOs? Second, what is the availability of channels other than as a contiguous segment? The study concluded, among other things, the following:

i. A contiguous 280 MHz segment could be coordinated on only 3 out of 10 paths studied.

ii. Because the available 6 MHz segments (the spectrum needed to transmit 1 video channel) is neither contiguous nor consistent from path to path, a conventional AML equipment design would not fit with the environment.

iii. It appears likely that different paths from a hub would be effected differently by interference and that it may be difficult to find large chunks of contiguous spectrum available on all paths from a hub.

Of significance, the Comsearch ten link study specifically set out to determine the feasibility of relocating to the new 17.7-18.3 GHz band. The study found that 70% of these relocated links would be unacceptable because of interference with pre-existing links. This amount (70%) is far in excess (by about 7X) of what one would conclude if one used the OET study findings as the basis for a projection of failed links in the frequency coordination process. Using the OET findings one would project approximately 10% (1 link), not 70% (7 links), to have unacceptable interference.

Therefore, IMCC believes that the FCC assertion that PCOs can relocate into the 17.7-18.14 space is highly questionable because PCOs could not provide the number of channels needed to compete with MSOs because there is already too much congestion in that space to allow for the introduction of relocated PCO paths. In addition, even if it were feasible to do so, the cost and business dislocation would be significant.

5. OET Study Flawed

The OET study, referenced at paragraph 17 of the Second Order and made available to IMCC pursuant to an FOIA request, analyzed the feasibility of relocating PCOs to the lower and upper CARS bands, 12.7-13.2 and 17.74-18.142. It studied the existing links in 32 cities. Of importance is the fact that fully one-third of all such cities are virtually irrelevant because they are not urban areas in which PCOs provide significant amounts of service and there are very few links about which to be concerned. Therefore, the OET conclusion that only 9% or 10% of PCO links could not be accommodated in the lower or upper CARS bands is invalid.

6. Comsearch Analysis of OET Study

Regarding the OET study, Comsearch is of the following views: (see Comsearch letter dated March 20, 2003, attached)

i. The FCC did not take the transmitter power levels into account in their D/U calculations. However, it is important to do so because the AML equipment used by PCOs commonly operates at power levels 20 to 30 dB lower than other microwave systems. Thus, digital and FM Video microwave transmitters would cause more interference into AML receivers than the FCC's study identified. Conversely, AML transmitters would cause less interference into digital and FM Video microwave receivers than the FCC study identified. Therefore, we conclude that the FCC was, to a large extent, considering the wrong interference cases in the OET study.

ii. The disparate transmitter power levels result in a significant likelihood that many cases with one antenna with a discrimination angle of greater than 30 degrees would have a C/I less than the FCC's 60 dB criterion. These cases would not have been considered in the study.

iii. The FCC's study does not appear to have considered the emission bandwidth of the radios in the replacement spectrum.

iv. The FCC did a path-by-path analysis that could result in "hybrid hubs" with both 13 and 18 GHz paths. An operator could have to purchase twice as much equipment under this scenario.

v. The FCC study focused on availability of replacement spectrum but did not address the impact of a 18.3-1.58 MHz licensing freeze on ongoing operations with respect to system modifications and expansion.

vi. Comsearch, analyzing the OET data, could not determine if the FCC study ensured that enough spectrum is available in the replacement bands to accommodate the total number of displaced channels.

vii. Nor could Comsearch determine if the FCC properly accounted for the emission bandwidth of the incumbent radios in determining the amount of spectrum impacted.

viii. The OET study did not indicate if the analysis explored how 440 MHz of contiguous spectrum might be found to replace the contiguous spectrum that is essential for PCO competition.

7. Comsearch Recalculation

In order to clarify and make certain of several points in the Comsearch letters of February 5 and March 20, 2003 regarding the FCC study, Comsearch did further work which is summarized in the letter dated May 5, 2003, also attached.

The Comsearch letter of February 5 was based upon the engineering practices of TIA TSB 10-F. The OET study was not. The May 5 letter includes a table detailing calculations which indicate the following:

i. The power level differences between the environment transmitter and proposed AML transmitter ranges from 11 to 39 dB in these cases. A difference of 20 to 30 dB is typical.

ii. Of the 38 direct interference cases into proposed AML receivers, a study that assumed equal interfering and desired transmitter powers and a 60 dB C/I objective would only have identified 5.

iii. Of the 38 direct interference cases into proposed AML receivers, 22 involve a discrimination angle from either the interfering or the victim antenna (or both) of more than 30 degrees.

8. IMCC Conclusions

Review of the OET study demonstrates several serious flaws and inaccuracies which draw into question the conclusions based on the study. For instance, the OET study appears to have ignored TIA TSB10-F and therefore did not take into account the various system output power level differences. This means the OET study seriously underestimated the interference into the AML systems from those systems.

Of the 7 links that were found unacceptable in the 10 link Comsearch analysis, the above condition affected all of them. This 20-30 dB bias is an unacceptable baseline for such an important study. As a consequence of the bias, the study underestimates how many PCO links would incur interference from existing links.

In an effort to account for why there is such a disparity between the OET findings and the Comsearch findings, an engineering test was devised. Comsearch re-conducted the 10 link

analysis so that it used all the standard Comsearch tools and data except that the system output power level differences were removed and a 60 dB C/I criteria (similar to the OET study) was used. The results of this test are that the number of interference cases into AML receivers reduced from 38 to 5. This reduction provides an important indication and check as to what is wrong with the OET study.

In addition, 22 cases of the 38 cases of interference into AML receivers involve a discrimination angle of more than 30 degrees from one or both antennas. The OET study does not consider these as interference cases even though they in fact are real cases of interference and the quantity of them is substantial.

Therefore, because the OET study did not take into account the power level differences or 20-30 dB and did not consider interference from sources that are greater than 30 degrees discrimination angle, the OET study has very limited credibility for the purpose to which it was applied.

IMCC concludes that the views asserted in the Second Order, that PCOs can relocate to the two CARS bands and continue to provide meaningful video competition to MSOs, is highly questionable for numerous significant technical reasons. Primarily, those bands are simply too congested already. But even if this spectrum was usable, relocation would entail costs and service degradation that makes the PCO business model unworkable.

Therefore, we conclude that the long term solution adopted by the FCC in the Second Order, for PCOs to vacate 18.3-18.58 and utilize the lower and upper CARS bands, is neither beneficial for PCOs or MDU residents, nor does it accomplish what Hughes wants because the "comparable facilities" test can not be met and, even if it could be met, would require a significant expense for Hughes and comparable companies.

9. Hughes Views Regarding Split Spectrum

The Order has at its root the assertion that 1000 MHz of contiguous band width is required for Hughes' system to be successful. Hughes objects to the suggestion that the 1000 MHz be granted in any way but a contiguous band. The reason for this objection is not based on operational feasibility, but on economic reasonableness and financial viability of their project. A split band solution is claimed to be unacceptable by them if the two bands used were of such disparate frequencies that the use required different system equipment employing different size waveguide transmission lines.

This is the same argument that PCOs assert now with respect to the "hybrid hub" solution put forward in the OET study. The hybrid hub notion destroys the economic viability of the PCO microwave networking solution.

III. Specific Problems Caused by the FCC Second Order on Reconsideration

The existing PCO service commitments, significant microwave investments and the ongoing business approach of the PCO industry has reasonably relied on the past, current and expected future availability of the 18 GHz band.

FCC Order 02-317 halts this fundamental assumption of the PCOs. The implications to the existing customer base, near term business commitments and future business expansion are very significant. The industry wide result will be increased costs to the PCOs, stranded assets and a limited ability to make new customer commitments, which individually and collectively threaten the viability of the PCO players and the strength of a competitive video market.

There are 4 facts that have a direct impact of this Order on PCOs:

1. Microwave is often employed as the low cost and fast deployment alternative to serve PCO customers in the highly competitive video business. The availability of the 18 GHz band is an important component of a low cost and effective network solution to ensure a robust competitive offering against the much larger MSOs.

2. There are a significant number of 18 GHz systems in operation serving existing customers, with the ability to be further expanded at a low incremental cost to serve additional new customers. These assets were deployed both to serve the initial customer opportunity, but with the full expectation of leveraging the initial systems for new microwave links to additional customers. Incremental paths off an existing transmitter, rearrangement of services within the existing operating band and the effective redeployment of working assets to new locations are now seriously limited or halted. This drastically increases the costs of adding new customer sites or services, burdening the PCO's with significant financial impacts in the very near term. The relocation cost recovery and comparable facilities provisions of the Order do not mitigate this fact. But more important is that the competitive model of the PCOs is immediately and greatly impacted.

3. The new band of 17.7 – 18.3 GHz, as noted elsewhere, does not meet the availability requirements or cost effectiveness of the PCO service providers. This suggested

band does not in any way replace the 18.142 – 18.54 GHz band previously provided to the PCOs:

- The 17.7 GHz band is quite congested and generally not available in urban areas, as concluded by the study completed by Comsearch.
- Even when some of the bandwidth is available, it is generally not contiguous, resulting in less total useable bandwidth, directly impacting the number of channels and other services that can be offered to the PCO customer.
- Equipment manufacturers do not currently offer equipment that operates in this new suggested frequency.
- If equipment was eventually made available from the manufacturers, the operational demands to implement such equipment within the fractured bandwidth and channelization introduces significant initial and ongoing costs, and risks the overall quality of service.

4. The FCC waiver process and other administrative procedures that may be available to address certain of the implications of the Order are inadequate to effectively deal with the competitive business environment that the PCOs must succeed within. The PCO, as a competitive service provider, must know of their technical and economic ability to provide timely service to a perspective customer in a very proactive approach. Simply, a customer would not be approached by a PCO if that customer could not be serviced economically under the new FCC decision. Yet that same customer might well have been very attractive under the previous rules because of the leverage provided by existing networks or frequency planning already in place. The low probability of the new frequency being contiguously available, the cost of a overlay network at 17.7 GHz (if the equipment eventually became available), the difficult operational implications of the resulting network infrastructure, the lengthy process to seek a waiver from the FCC to operate within the previous 18.14-18.54 GHz band, and the demand in the marketplace for a responsive, competitive commitment to the prospective customer concludes that future market penetration for the PCOs is very significantly negatively impacted.

The PCO's future business prospects and the robustness of a competitive video model in the marketplace are directly harmed by this Order.

It is critical that the existing assets deployed in the network be allowed to continue to be employed for incremental service offerings to current and prospective customers. The Order

does not contemplate this situation and expanded business requirements, but only deals with the treatment of existing assets not being leveraged with new and growing business opportunities. In fact, there are very few existing 18.14 – 18.54 GHz systems that will be static in the near term. Operating systems are typically adjusted or augmented to enhance services to existing customers to remain competitive with the increasing offerings of other service providers, or to offer initial service to new prospective customers within the abilities of the core 18.14 – 18.54 GHz infrastructure in place.

It is equally critical that new, economic and available microwave network solutions continue to be available to PCOs, without interruption. The impact of the Order eliminates this very important competitive need because of the technical limitations of the new suggested 17.7 – 18.14 GHz band, as explained earlier.

The recovery of costs associated with system replacement at some point in the future, as provided for in the Order, while appropriate in general, does not address the current business requirements of the PCO marketplace. Inherently, for this to be an adequate solution to the removal of the 18.3 – 18.54 GHz band from PCO licensing, it is assumed that the new approved bands are reasonably available, there is no short term incremental costs to the PCOs in migrating to this new band, and the competitive position of the PCOs is not impacted in the shorter term. As explained, all of these assumptions are flawed.

While the principle of reallocation cost recovery is fully supported by the IMCC in general, because of the specifics of this Order, cost recovery alone does not adequately address the impact of the adjusted frequency allocation model.

As way of explanation, we offer the following examples to aid in the understanding of the significant and immediate impact of the Order on the PCO service providers, each of which is separate from and not addressed by the relocation, "comparable facilities" provisions:

a. Existing System Expansion

The typical architecture of a microwave system is a single transmitter (e.g.: operating at 18.14 – 18.54 GHz) feeding the video and other services to remote receivers located at various MDU customer locations. The transmitter, or hub, is the most expensive component to the system, and employs a single frequency range to broadcast to all receivers on that system.

New customers within range of the transmitter are served by installing a receiver at the customer location. The previous investment in the transmitter and other equipment is leveraged, lowering the overall cost of the incremental customer installation.

The Order alters this critical network architecture model and resulting cost efficiency. New customers will not be able to be served by the existing transmitter and past frequencies with certainty and timeliness, only through a potential waiver process at best. The cost to deploy a microwave link in the new 17.7 – 18.3 GHz band requires the investment in a new transmitter and supporting infrastructure designed to operate in the new band (which is not currently available from equipment manufactures). In any case, the network costs significantly increase and the past transmitter investment is stranded and not able to be economically leveraged to support ongoing business growth.

b. Existing System Rearrangement

Historically, customers request or competitive requirements demand, existing video services are often enhanced through the addition of channel offerings or digital video services. This is accomplished using the existing microwave infrastructure and already licensed bandwidth. However, the existing microwave license has to be modified to reflect certain of these service offering changes.

The Order limits the past ability to effectively employ normal operational and service enhancements, introducing both service risk and a potential cost. An amended license is not certain going forward, even though the frequency bands are not altered, and in any case, would need to be processed as a waiver because of the Order, adding both time and cost to the process. If for some reason under the Order the waiver was not granted, the only options available to the PCO would be to forgo the incremental business opportunity, or overbuild the existing system at a very significant cost.

Even if the waiver was in fact granted, it is not certain how the terms of the later relocation cost formula would be implemented. The immediate concern is the ability to serve the customer and to maintain an economical use of existing assets. Regardless, the relocation cost model implications also need to be understood.

c. Re-Use of Existing Assets

It is very common for existing microwave assets to be redeployed to new locations as required to economically manage the overall network and service deployment strategies. Since the PCOs employ the 18.14 – 18.54 GHz equipment in the customer access network (the “last

mile"), existing microwave links are decommissioned when fiber replacement is justified or when a customer contract ends. In either case, the past microwave investment is not lost, as these assets are easily redeployed to a new location, unlike fiber or other more permanent technologies. The redeployment occurrence of access-located microwave is much more pronounced than core network applications, because of the end-customer contract activity and other factors.

The Order directly eliminates or severely limits this normal reuse of existing microwave assets in new locations. A new license would be required in the 18.14 – 18.54 GHz band, which based on the Order, would not be expected. As a result, these assets would be worthless, although fully viable prior to the Order. It is noted that the relocation cost formula would not mitigate the financial impact to the PCO in this case, as the assets would not be in service at the later date of relocation initiated by a third party. Hence, the full financial burden of the Order is often borne by the PCO.

d. Near Term Microwave Deployment Plans

As presented previously, equipment operating in the new 17.7 – 18.3 GHz band is not yet commercially available. Other implementation issues such as the frequency channelization and other technicalities are not yet finalized. Even if the frequency was available without interference or significant non-contiguous availability (which the IMCC believes not to be the case), near term deployment to meet customer opportunities or competitive threats are not possible at this time. The resulting implication obviously harms the PCO competitive position and service economics.

In addition, there are license applications in process or that would have been filed shortly had the Order not been issued. These represent near immediate requirements for link additions to existing systems, rearrangement of services being transported on existing systems, or in some cases, new systems with business drivers supporting the need. It is critical that these immediate business requirements be addressed in a fair and prudent manner to mitigate the very negative impacts the Order has on the immediate needs of the PCOs without a reasonable technical alternative now available.

IV. Relief Sought by IMCC

1. The recent change to GSO FSS as the sole primary allocation of the 18.3-18.58 GHz band rested on a premise that is untrue. As we showed above, giving PCOs access to 12.7-13.2 and 17.7-18.3 GHz cannot replace the loss of 18.3-18.58 GHz. And the Commission's reason for originally denying GSO FSS sole primary status at 18.3-18.58 GHz remains in full force: PCOs need that spectrum to maintain competition to franchised cable operators.

For these reasons the Commission should (a) reverse the Second Order on Reconsideration and restore 18.3-18.58 to a co-primary allocation for FS and GSO FSS; (b) reinstate *nunc pro tunc* on a co-primary basis all FS applications pending on November 19, 2002; and (c) accept new applications for FS systems going forward.

2. Even if the Commission does not restore 18.3-18.58 GHz to a co-primary allocation, it should accommodate the legitimate needs of the PCO industry by:

(a) Reinstating *nunc pro tunc* all FS applications at 18.3-18.58 GHz pending on November 19, 2002; and

(b) Accepting applications for new FS systems 18.3-18.58 GHz on the affidavit of the applicant (i) that the application was substantially complete on November 19, 2002, and would have been filed soon thereafter but for the application cut-off on that date, and (ii) that comparable facilities, as defined in Section 101.75(b), cannot be coordinated and constructed at comparable cost in another band.

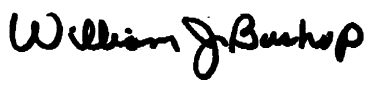
3. The Second Order on Reconsideration sets up an extremely unfair situation for a PCO that must add new spokes or make other modifications to existing systems at 18.3-18.58 GHz. The Commission acknowledges that PCOs usually have to configure their FS systems in a hub-and-spoke architecture. But the Commission has not acknowledged that this raises special problems under the relocation rules. A PCO that has to install a new spoke (or make any other modification) after November 19, 2002, must expend resources to do so even though an FSS provider could step in the next day and demand relocation *without having to relocate the new spoke*. Or, more likely, the PCO may have to limit its risk by forgoing service to the building that requires the additional spoke.

The situation is very different for an FS system configured in linear links. There, the FS provider can often add a needed new link in non-reallocated spectrum, and thus avoid any risk of the new link having to be relocated. Here, where the pre-existing hub is a shared facility, the PCO may have no choice but to construct, if at all, in spectrum newly allocated to FSS.

In short, the Commission is requiring the PCOs to bear an otherwise unnecessary business risk solely for the benefit of Hughes and its competitors. That is simply unfair.

To balance the equities, the Commission should permit modification or expansion of an FS facility at 18.3-18.58 GHz even if doing so will increase the cost of relocation, on the affidavit of the applicant that comparable facilities (as defined in Section 101.75(b)) cannot be coordinated and constructed at comparable cost in another band.

Respectfully submitted,



William J. Burhop
Executive Director
Independent Multifamily
Communications Council
3004 Oregon Knolls Drive, NW
Washington, DC 20015
202 364 0882

May 8, 2003

19700 Janelia Farm Boulevard
Ashburn, VA 20147 USA
(703) 726-5500
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http://www.comsearch.com

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ATTACHMENT - 1

February 5, 2003

Mr. Bill Burhop
IMCC
3004 Oregon Knolls Drive, N.W.
Washington, DC 20015

BY EMAIL

RE: Interference Study
Multi-channel Video Systems in the 17.7-18.14 GHz Band

Dear Mr. Burhop:

Please find attached the interference study that you requested regarding availability of spectrum in the 17.7-18.14 GHz band to replace the 18.3-18.58 GHz spectrum that is being lost.

Background

The FCC's Second Order on Reconsideration in IB Docket 98-172 removed the co-primary designation for the Fixed Service in the 18.3-18.58 GHz segment. Licensees of private cable systems, the primary users of 18.3-18.58 GHz, are adversely affected by the FCC's decision in that they can no longer license new systems nor modify existing systems on a primary basis in that segment. The Order cited enhanced eligibility for CARS (Part 78) licenses, making the 12.7-13.25 GHz and 17.7-18.14 GHz bands available for private cable systems, as a rationale for this decision. The purpose of this study is to examine the availability of the 17.7-18.14 GHz band for multi-channel AML video systems by performing an interference analysis on a representative set of ten paths using the parameters presently licensed in the 18.14-18.58 GHz segment. The study is being conducted to address the following questions:

1.) Is a contiguous 280 MHz segment generally available to replace the 280 MHz for which the co-primary designation was removed?
2.) What is the availability of channels other than as a contiguous segment?

Methodology

Using input from IMCC members, a sample of ten licensed paths using the 18.14-18.58 GHz segment was selected from the Comsearch microwave path database. As input to the study, the frequencies of these ten paths were changed to the 17.7-18.14 GHz segment keeping all other licensed parameters unchanged. Path data sheets are attached showing the configuration that was studied for each path.

Attachment 1

Using Comsearch's microwave path analysis software, an interference analysis was conducted for the ten path sample against the Comsearch database of proposed, applied, and licensed paths in the 17.7 – 18.14 GHz segment. Into the multi-channel AML video receivers, harmful interference was assumed to exist if an environment transmitter could produce an interference level within 6 dB of the receiver thermal noise power level in a 6 MHz channel bandwidth.

The receiver thermal noise power level is calculated as:

$$N = -114 + 10\log BW + NF$$

where: N = Receiver Thermal Noise Power Level (dBm)
BW = Receiver Bandwidth (MHz)
NF = Receiver Noise Figure (dB)

With a 6 MHz bandwidth and an assumed 5 dB noise figure, the interference objective into the AML receivers was established as:

$$N - 6 = [-114 + 10\log 6 + 5] - 6 = -107(dBm)$$

Into the environment receivers potentially affected by interference from the AML transmitters, interference criteria appropriate to the particular receiver were applied. Nearly all of the environment receivers in this study used digital modulation, and the interference objectives of these receivers are derived from T/I criteria provided by the equipment manufacturers.

The interference levels and C/I ratios were calculated based on the licensed power levels of each channel. For the environment paths this is the total transmitter output power while for the proposed AML paths this is the power density per 6 MHz. For cases into environment receivers it may be considered desirable to include a multiple exposure factor to account for the receiver being exposed to multiple 6 MHz AML channels within its bandwidth, while for cases into the proposed AML receivers, it may be considered desirable to include a correction factor to account for the power of digital interfering transmitters being spread across a bandwidth wider than the 6 MHz bandwidth of the AML channels. In the study we verified that no additional cases into environment receivers beyond those reported here would need to be included if a multiple exposure factor were used. Otherwise, bandwidth correction factors were not considered in this study.

Results

Table 1 shows the channels impacted by interference on each path. Table 2 summarizes the interference cases that were identified in the analysis including case margin, environment frequencies, polarizations, and bandwidth. In addition, we are forwarding a spreadsheet that includes Tables 1 and 2 and also an additional worksheet with the complete details of each interference case.

Attachment 1

Cases with a distance between interfering transmitter and victim receiver of less than 0.5 km are also reported in the results and displayed as a separate category in Table 1. Although direct far-field interference calculations indicate that these cases may meet the interference objectives, such path geometries are known to be difficult to coordinate and are not recommended. There are several reasons for this recommendation including the fact that coordinate rounding and errors could have a huge impact on the results when the interference path is so short.

As shown in Table 2, the study identified 1 direct interference case into an environment receiver, 38 direct interference cases into proposed AML receivers, and 23 cases with less than 0.5 km between interfering transmitter and victim receiver. Of the 38 cases into proposed receivers, 12 missed the –107 dBm interference objective by less than 3 dB and may be considered acceptable.

Conclusions

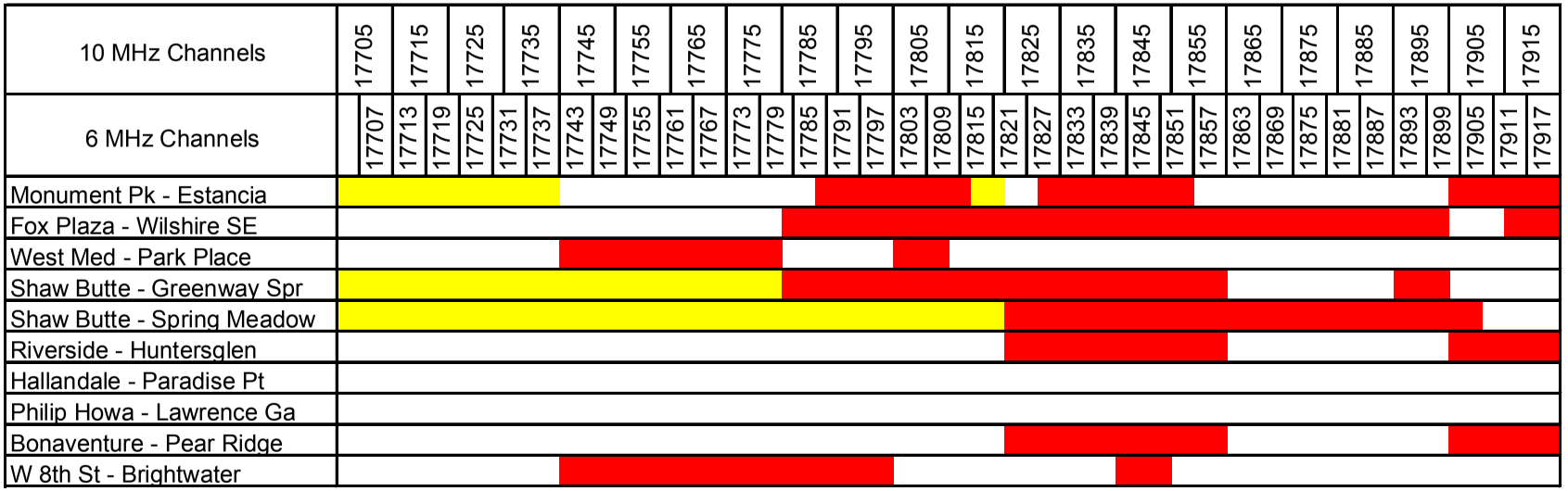
- The low transmit power levels of the proposed paths in terms of dBm/6 MHz results in little interference into the environment – most of the cases are into the proposed path receivers
- A contiguous 280 MHz segment could be coordinated on only 3 out of 10 paths studied
- It would be difficult to coordinate transmitters in the 17.7-18.14 GHz segment at Shaw Butte, AZ because the high/low frequency plan established by other carriers at the site uses that segment to receive
- A number of 6 MHz channels are available on each path other than those transmitting from Shaw Butte
- Because the available 6 MHz segments are not contiguous nor consistent from path to path, a conventional AML equipment design would not fit with the environment
- For downstream transmission to cable television customers it would be desirable to be able to assign the same channels to all paths transmitting from a hub in a hub-and-spoke path arrangement; however, it appears likely that different paths from a hub would be affected differently by interference and that it may be difficult to find large chunks of contiguous spectrum available on all paths from a hub

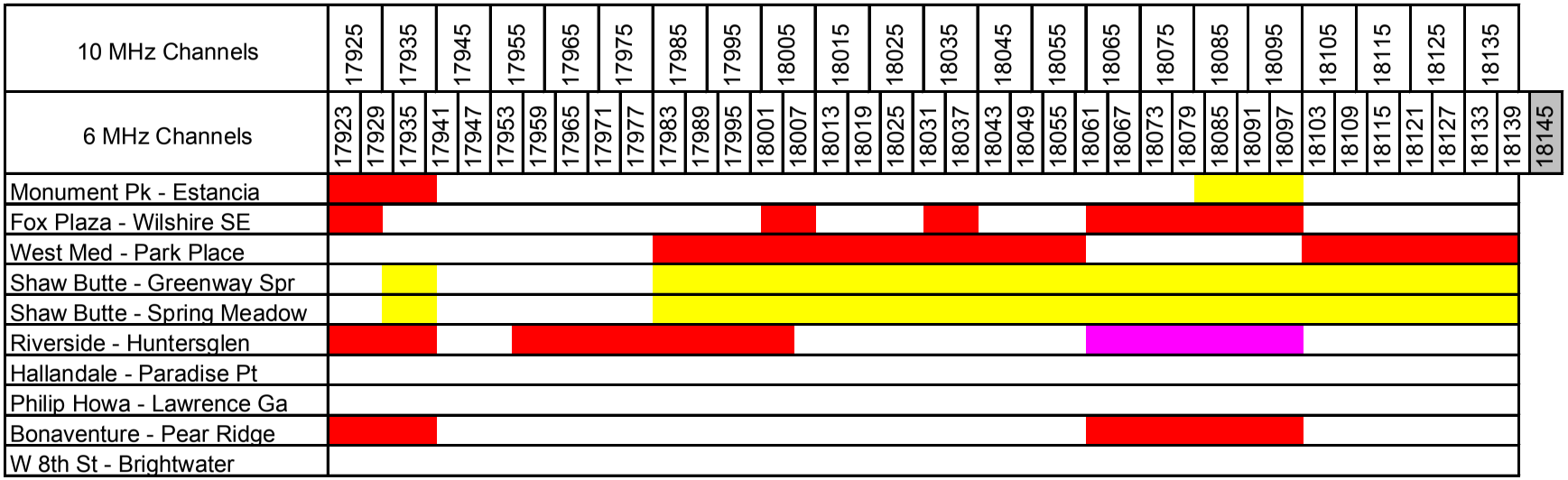
Should you have any questions or require additional information please call me at (703) 726-5681.

Sincerely,

William W. Perkins
Principal Engineer
Spectrum Management Solutions

Attachment 1





Interference into Environment Receiver
Interference into Proposed Receiver
Transmitter near Co-channel Receiver

Table 1: Channels Impacted by Interference

Attachment 1

#	Proposed Path	Inerference Distance (km)	Case Margin (20%) (dB)	Case Margin (0.01%) (dB)	Environment Path Emission Designator	Environment Path Radio Bandwidth (MHz)	Freq1	Pol 1	Freq2	Pol 2	Freq3	Pol3	Freq4	Pol4	Case Type
1	Monument Pk - Estancia	**0.4**			40M0F7D	40	17720	V							Into Environment
2	Monument Pk - Estancia	**0.3**			20M0F8W	20	17810	V							Into Environment
3	Monument Pk - Estancia	**0.3**			20M0F8W	20	18090	V							Into Environment
4	Monument Pk - Estancia	24.7	**-2.4**	7.6	28M0D7W	28	17800	V							Into Proposed
5	Monument Pk - Estancia	6.7	**-32.5**	**-22.5**	28M0D7W	28	17840	H							Into Proposed
6	Monument Pk - Estancia	13.2	**-12.4**	**-2.4**	40M0F7W	40	17920	V							Into Proposed
7	Fox Plaza - Wilshire SE	37.8	**-13.5**	**-3.5**	40M0G7W	40	17800	V							Into Proposed
8	Fox Plaza - Wilshire SE	6.4	**-15.3**	**-5.3**	40M0F7W	40	17840	V							Into Proposed
9	Fox Plaza - Wilshire SE	15.5	**-2.1**	7.9	10M0F7W	10	17865	V							Into Proposed
10	Fox Plaza - Wilshire SE	15.1	**-10.6**	**-0.6**	40M0F7W	40	17880	H	18080	V					Into Proposed
11	Fox Plaza - Wilshire SE	2.1	**-1.5**	8.5	10M0F7W	10	17895	V							Into Proposed
12	Fox Plaza - Wilshire SE	12.7	**-8.1**	1.9	10M0F7W	10	17915	V							Into Proposed
13	Fox Plaza - Wilshire SE	12.0	**-2.7**	7.3	10M0F7W	10	17925	V							Into Proposed
14	Fox Plaza - Wilshire SE	14.3	**-2.7**	7.3	10M0F7W	10	18005	V							Into Proposed
15	Fox Plaza - Wilshire SE	21.1	**-0.4**	9.6	10M0F7W	10	18035	V							Into Proposed
16	Fox Plaza - Wilshire SE	12.5	**-17.2**	**-7.2**	10M0F7W	10	18075	H							Into Proposed
17	Fox Plaza - Wilshire SE	21.1	**-14.3**	**-4.3**	10M0F7W	10	18075	V							Into Proposed
18	Fox Plaza - Wilshire SE	12.0	**-28.3**	**-18.3**	40M0F7W	40	18080	V							Into Proposed
19	West Med - Park Place	23.6	**-5.0**	5.0	6M30F7W	6.3	17745	V							Into Proposed
20	West Med - Park Place	8.2	**-2.7**	7.3	40M0F7W	40	17760	V	18000	V					Into Proposed
21	West Med - Park Place	4.7	**-6.3**	3.7	10M0F7W	10	17805	V							Into Proposed
22	West Med - Park Place	8.2	**-1.1**	8.9	40M0F7W	40	17920	H	18120	V					Into Proposed
23	West Med - Park Place	2.4	**-6.2**	3.8	10M0F7W	10	18005	V							Into Proposed
24	West Med - Park Place	12.9	**-4.2**	5.8	40M0G7W	40	18040	V							Into Proposed
25	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	17720	V							Into Environment
26	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	17760	H							Into Environment
27	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	17760	V	18000	V	18040	H	18080	V	Into Environment
28	Shaw Butte - Greenway Spr	**0.0**			40M0F7D	40	17800	V							Into Environment
29	Shaw Butte - Greenway Spr	**0.1**			10M0F7W	10	17935	V							Into Environment
30	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18000	V	18040	H	18080	V			Into Environment
31	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18000	V							Into Environment
32	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18000	V							Into Environment
33	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18080	V							Into Environment
34	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18120	V							Into Environment
35	Shaw Butte - Greenway Spr	7.8	**-1.1**	7.5	40M0F7D	40	17800	V							Into Proposed
36	Shaw Butte - Greenway Spr	3.7	**-3.4**	5.9	40M0F7W	40	17840	H							Into Proposed
37	Shaw Butte - Greenway Spr	3.8	**-13.3**	**-3.3**	5M00G7W	5	17895	V							Into Proposed

Table 2: Interference Cases

Attachment 1

#	Proposed Path	Inerference Distance (km)	Case Margin (20%) (dB)	Case Margin (0.01%) (dB)	Environment Path Emission Designator	Environment Path Radio Bandwidth (MHz)	Freq1	Pol 1	Freq2	Pol 2	Freq3	Pol3	Freq4	Pol4	Case Type
38	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	17720	V							Into Environment
39	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	17760	H							Into Environment
40	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	17760	V	18000	V	18040	H	18080	V	Into Environment
41	Shaw Butte - Spring Meadow	**0.0**			40M0F7D	40	17800	V							Into Environment
42	Shaw Butte - Spring Meadow	**0.1**			10M0F7W	10	17935	V							Into Environment
43	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18000	V	18040	H	18080	V			Into Environment
44	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18000	V							Into Environment
45	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18000	V							Into Environment
46	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18080	V							Into Environment
47	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18120	V							Into Environment
48	Shaw Butte - Spring Meadow	6.4	**-7.1**	2.9	40M0F7W	40	17840	H							Into Proposed
49	Shaw Butte - Spring Meadow	3.5	**-12.1**	**-2.1**	40M0F7W	40	17880	H							Into Proposed
50	Shaw Butte - Spring Meadow	3.5	**-0.8**	9.2	50M0D7W	50	17880	H							Into Proposed
51	Shaw Butte - Spring Meadow	6.5	**-8.7**	1.3	5M00G7W	5	17895	V							Into Proposed
52	Riverside - Huntersglen	3.6	**-9.5**	0.5	40M0F7W	40	18080	V							Into Environment
53	Riverside - Huntersglen	26.2	**-38.7**	**-33.5**	40M0G7W	40	17920	V							Into Proposed
54	Riverside - Huntersglen	15.7	**-2.0**	8.0	50M0D7W	50	17980	V							Into Proposed
55	Riverside - Huntersglen	1.1	**-71.4**	**-61.4**	40M0F7W	40	18080	V							Into Proposed
56	Bonaventure - Pear Ridge	24.0	**-3.5**	6.5	40M0F7W	40	17840	V	18080	V					Into Proposed
57	Bonaventure - Pear Ridge	24.7	**-5.8**	4.2	40M0F7D	40	17920	V							Into Proposed
58	W 8th St - Brightwater	37.4	**-7.9**	2.1	20M0F8F	20	17750	V							Into Proposed
59	W 8th St - Brightwater	8.8	**-3.2**	6.8	40M0F7W	40	17760	V							Into Proposed
60	W 8th St - Brightwater	**0.2**	**-7.9**	2.1	10M0F7W	10	17785	V							Into Proposed
61	W 8th St - Brightwater	37.4	**-6.5**	3.5	20M0F8F	20	17790	V							Into Proposed
62	W 8th St - Brightwater	17.0	**-1.0**	9.0	10M0F7W	10	17845	V							Into Proposed

Table 2: Interference Cases (continued)

Attachment 1

COMSEARCH
19700 Janelia Farm Blvd.
Ashburn, VA 20147
(703) 726-5500

01/21/2003

MICROWAVE PATH DATA

STATION NAME	MONUMENT PK CA		ESTANCIA CA
PATH STATUS	PROPOSED		
CALL SIGN	WPOP375		
OWNER CODE	STRHOL		STRHOL
LATITUDE (D-M-S) (NAD83)	37 29 17.0		37 23 56.8
LONGITUDE (D-M-S) (NAD83)	121 51 59.0		121 57 9.9
GROUND ELEV (Ft/m-AMSL)	2439.1/743.41		15.0/4.57
PATH AZIMUTH (Deg)	217.773		37.721
PATH DISTANCE (Miles)		7.757	
(Km)		12.484	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS SU6-190/220		NOT APPLICABLE
ANT CODE	83008C		
GAIN(dBi)/BEAMWIDTH(Deg)	48.0/0.66		
C/L (Ft/m-AGL)	160.0/48.77		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS SU6-190/220
ANT CODE			83008C
GAIN(dBi)/BEAMWIDTH(Deg)			48.0/0.66
C/L (Ft/m-AGL)			18.0/5.49
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	BLONDER TONGUE		RECEIVE
TRANSMITTER MODEL	TX18051		ONLY
COMSEARCH INTERNAL ID	TEM811		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.002000		0.002000
POWER (dBm/Watts)	-6.0/0.000251		
RECEIVED LEVEL (dBm)			-52.8
EIRP (dBm/Watts)	41.0/12.6		
FIXED LOSS: TX|COMMON(dB)	0.0| 1.0		0.0| 2.0
FREE SPACE LOSS (dB)		139.8	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

STRHOL = TRANSMISSION HOLDING, INC.

Attachment 1

COMSEARCH
19700 Janelia Farm Blvd.
Ashburn, VA 20147
(703) 726-5500

01/21/2003

MICROWAVE PATH DATA

STATION NAME	FOX PLAZA CA		WILSHIRE SE CA
PATH STATUS	PROPOSED		
CALL SIGN	WNTS944		
OWNER CODE	ADECAL		ADECAL
LATITUDE (D-M-S) (NAD83)	34 3 19.0		34 3 38.0
LONGITUDE (D-M-S) (NAD83)	118 24 47.3		118 26 19.2
GROUND ELEV (Ft/m-AMSL)	300.0/91.44		350.1/106.70
PATH AZIMUTH (Deg)	283.957		103.942
PATH DISTANCE (Miles)		1.509	
(Km)		2.428	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS		NOT APPLICABLE
	DA2-190/220AZ		
ANT CODE	81003C		
GAIN(dBi)/BEAMWIDTH(Deg)	38.7/1.90		
C/L (Ft/m-AGL)	400.0/121.92		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS
			DA4-190/220AZ
ANT CODE			82003B
GAIN(dBi)/BEAMWIDTH(Deg)			44.5/0.90
C/L (Ft/m-AGL)			136.8/41.70
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	OMNIVISION INC		RECEIVE
TRANSMITTER MODEL	L29OTI-1810		ONLY
COMSEARCH INTERNAL ID	TEM659		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-6.0/0.000251		
RECEIVED LEVEL (dBm)			-49.4
EIRP (dBm/Watts)	31.7/1.5		
FIXED LOSS: TX|COMMON(dB)	0.0| 1.0		0.0| 0.0
FREE SPACE LOSS (dB)		125.6	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

ADECAL = ADELPHIA CALIFORNIA CABLEVISION, LLC

Attachment 1

COMSEARCH
19700 Janelia Farm Blvd.
Ashburn, VA 20147
(703) 726-5500

01/21/2003

MICROWAVE PATH DATA

STATION NAME	WEST MED CA		PARK PLACE CA
PATH STATUS	PROPOSED		
CALL SIGN	WNTU344		
OWNER CODE	ADECAL		ADECAL
LATITUDE (D-M-S) (NAD83)	33 45 16.1		33 44 47.1
LONGITUDE (D-M-S) (NAD83)	117 49 59.2		117 52 12.2
GROUND ELEV (Ft/m-AMSL)	160.0/48.77		112.0/34.14
PATH AZIMUTH (Deg)	255.382		75.361
PATH DISTANCE (Miles)		2.198	
(Km)		3.538	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS		NOT APPLICABLE
	PA4-190AZ		
ANT CODE	CB0082		
GAIN(dBi)/BEAMWIDTH(Deg)	44.7/0.90		
C/L (Ft/m-AGL)	110.0/33.53		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS
			PA6-190AZ
ANT CODE			CB0093
GAIN(dBi)/BEAMWIDTH(Deg)			48.2/0.66
C/L (Ft/m-AGL)			60.0/18.29
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	LASER VISION INC		RECEIVE
TRANSMITTER MODEL	I8BLV5018		ONLY
COMSEARCH INTERNAL ID	TEM231		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-12.0/0.000063		
RECEIVED LEVEL (dBm)			-49.0
EIRP (dBm/Watts)	32.7/1.9		
FIXED LOSS: TX|COMMON(dB)	0.0| 0.0		0.0| 1.0
FREE SPACE LOSS (dB)		128.9	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

ADECAL = ADELPHIA CALIFORNIA CABLEVISION, LLC

Attachment 1

COMSEARCH
19700 Janelia Farm Blvd.
Ashburn, VA 20147
(703) 726-5500

01/21/2003

MICROWAVE PATH DATA

STATION NAME	SHAW BUTTE AZ		GREENWAY SPR AZ
PATH STATUS	PROPOSED		
CALL SIGN	WNTZ720		
OWNER CODE	STRHOL		STRHOL
LATITUDE (D-M-S) (NAD83)	33 35 39.1		33 37 36.1
LONGITUDE (D-M-S) (NAD83)	112 5 14.5		112 5 52.5
GROUND ELEV (Ft/m-AMSL)	2149.1/655.00		1315.1/400.81
PATH AZIMUTH (Deg)	344.799		164.793
PATH DISTANCE (Miles)		2.321	
(Km)		3.735	
ANTENNA			
PRIMARY TX	GABRIEL ELECTRONIC HE6-180A		NOT APPLICABLE
ANT CODE	GB3001		
GAIN(dBi)/BEAMWIDTH(Deg)	48.2/1.00		
C/L (Ft/m-AGL)	10.0/3.05		
PRIMARY RX	NOT APPLICABLE		GABRIEL ELECTRONIC PE6-180
ANT CODE			GB3002
GAIN(dBi)/BEAMWIDTH(Deg)			48.3/1.00
C/L (Ft/m-AGL)			30.0/9.14
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	LASER VISION INC		RECEIVE
TRANSMITTER MODEL	I8BLV5018		ONLY
COMSEARCH INTERNAL ID	TEM231		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-9.0/0.000126		
RECEIVED LEVEL (dBm)			-44.9
EIRP (dBm/Watts)	39.2/8.3		
FIXED LOSS: TX|COMMON(dB)	0.0| 0.0		0.0| 3.0
FREE SPACE LOSS (dB)		129.4	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

STRHOL = TRANSMISSION HOLDING, INC.

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MICROWAVE PATH DATA

STATION NAME	SHAW BUTTE AZ		SPRING MEADO AZ
PATH STATUS	PROPOSED		
CALL SIGN	WNTZ720		
OWNER CODE	STRHOL		STRHOL
LATITUDE (D-M-S) (NAD83)	33 35 39.1		33 34 37.1
LONGITUDE (D-M-S) (NAD83)	112 5 14.5		112 9 10.5
GROUND ELEV (Ft/m-AMSL)	2149.1/655.00		1215.1/370.33
PATH AZIMUTH (Deg)	252.592		72.556
PATH DISTANCE (Miles)		3.963	
(Km)		6.378	
ANTENNA			
PRIMARY TX	GABRIEL ELECTRONIC HE6-180A		NOT APPLICABLE
ANT CODE	GB3001		
GAIN(dBi)/BEAMWIDTH(Deg)	48.2/1.00		
C/L (Ft/m-AGL)	10.0/3.05		
PRIMARY RX	NOT APPLICABLE		GABRIEL ELECTRONIC PE6-180
ANT CODE			GB3002
GAIN(dBi)/BEAMWIDTH(Deg)			48.3/1.00
C/L (Ft/m-AGL)			10.0/3.05
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	LASER VISION INC		RECEIVE
TRANSMITTER MODEL	I8BLV5018		ONLY
COMSEARCH INTERNAL ID	TEM231		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-9.0/0.000126		
RECEIVED LEVEL (dBm)			-49.5
EIRP (dBm/Watts)	39.2/8.3		
FIXED LOSS: TX|COMMON(dB)	0.0| 0.0		0.0| 3.0
FREE SPACE LOSS (dB)		134.0	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

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MICROWAVE PATH DATA

STATION NAME	RIVERSIDE TX		HUNTERSGLEN TX
PATH STATUS	PROPOSED		
CALL SIGN	WPNC334		
OWNER CODE	STRHOL		STRHOL
LATITUDE (D-M-S) (NAD83)	32 47 35.5		32 46 58.5
LONGITUDE (D-M-S) (NAD83)	97 3 29.0		97 3 45.0
GROUND ELEV (Ft/m-AMSL)	535.0/163.07		510.0/155.45
PATH AZIMUTH (Deg)	200.068		20.065
PATH DISTANCE (Miles)		0.754	
(Km)		1.213	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS		NOT APPLICABLE
	DA4-190		
ANT CODE	CB0079		
GAIN(dBi)/BEAMWIDTH(Deg)	44.7/0.90		
C/L (Ft/m-AGL)	120.0/36.58		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS
			DA2-190
ANT CODE			CB0059
GAIN(dBi)/BEAMWIDTH(Deg)			38.9/0.90
C/L (Ft/m-AGL)			30.0/9.14
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	AML WIRELESS		RECEIVE
TRANSMITTER MODEL	DOO63QAMLHOT18121		ONLY
COMSEARCH INTERNAL ID	TEM798		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-3.0/0.000501		
RECEIVED LEVEL (dBm)			-46.0
EIRP (dBm/Watts)	34.7/3.0		
FIXED LOSS: TX|COMMON(dB)	0.0| 7.0		0.0| 0.0
FREE SPACE LOSS (dB)		119.6	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

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MICROWAVE PATH DATA

STATION NAME	BONAVENTURE TX		PEAR RIDGE TX
PATH STATUS	PROPOSED		
CALL SIGN	WNTP850		
OWNER CODE	STRHOL		STRHOL
LATITUDE (D-M-S) (NAD83)	32 58 2.4		33 0 7.4
LONGITUDE (D-M-S) (NAD83)	96 49 7.0		96 49 30.0
GROUND ELEV (Ft/m-AMSL)	609.0/185.60		652.0/198.73
PATH AZIMUTH (Deg)	351.186		171.183
PATH DISTANCE (Miles)		2.421	
(Km)		3.897	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS		NOT APPLICABLE
	DA6-190C		
ANT CODE	CB0095		
GAIN(dBi)/BEAMWIDTH(Deg)	48.2/0.64		
C/L (Ft/m-AGL)	146.0/44.50		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS
			PA4-190AZ
ANT CODE			CB0082
GAIN(dBi)/BEAMWIDTH(Deg)			44.7/0.90
C/L (Ft/m-AGL)			35.0/10.67
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	LASER VISION INC		RECEIVE
TRANSMITTER MODEL	I8BLV5018		ONLY
COMSEARCH INTERNAL ID	TEM231		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-8.0/0.000158		
RECEIVED LEVEL (dBm)			-48.8
EIRP (dBm/Watts)	39.2/8.3		
FIXED LOSS: TX|COMMON(dB)	0.0| 1.0		0.0| 3.0
FREE SPACE LOSS (dB)		129.7	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

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MICROWAVE PATH DATA

STATION NAME	HALLANDALE FL		PARADISE PT FL
PATH STATUS	PROPOSED		
CALL SIGN	WPNB361		
OWNER CODE	STRHOL		STRHOL
LATITUDE (D-M-S) (NAD83)	25 59 7.3		26 2 10.8
LONGITUDE (D-M-S) (NAD83)	80 8 7.1		80 7 55.5
GROUND ELEV (Ft/m-AMSL)	9.0/2.74		6.0/1.83
PATH AZIMUTH (Deg)	3.269		183.270
PATH DISTANCE (Miles)		3.515	
(Km)		5.656	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS DA6-190		NOT APPLICABLE
ANT CODE	CB0090		
GAIN(dBi)/BEAMWIDTH(Deg)	48.2/0.64		
C/L (Ft/m-AGL)	151.0/46.02		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS DA6-190
ANT CODE			CB0090
GAIN(dBi)/BEAMWIDTH(Deg)			48.2/0.64
C/L (Ft/m-AGL)			38.0/11.58
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	AML WIRELESS		RECEIVE
TRANSMITTER MODEL	DOO63QAMLHOT18121		ONLY
COMSEARCH INTERNAL ID	TEM798		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-5.0/0.000316		
RECEIVED LEVEL (dBm)			-43.6
EIRP (dBm/Watts)	42.2/16.6		
FIXED LOSS: TX|COMMON(dB)	0.0| 1.0		0.0| 1.0
FREE SPACE LOSS (dB)		133.0	
TRANSMIT (17,705-18,140)V			
FREQUENCIES			
(MHZ)			

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MICROWAVE PATH DATA

STATION NAME	PHILIP HOWA NY		LAWRENCE GA NY
PATH STATUS	PROPOSED		
CALL SIGN	WNTM209		
OWNER CODE	MICSTB		MICSTB
LATITUDE (D-M-S) (NAD83)	40 37 50.4		40 36 14.4
LONGITUDE (D-M-S) (NAD83)	73 56 39.5		73 56 29.5
GROUND ELEV (Ft/m-AMSL)	30.0/9.14		15.0/4.57
PATH AZIMUTH (Deg)	175.460		355.462
PATH DISTANCE (Miles)		1.846	
(Km)		2.971	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS		NOT APPLICABLE
	PA6-190AZ		
ANT CODE	CB0093		
GAIN(dBi)/BEAMWIDTH(Deg)	48.2/0.66		
C/L (Ft/m-AGL)	178.0/54.25		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS
			PA6-190AZ
ANT CODE			CB0093
GAIN(dBi)/BEAMWIDTH(Deg)			48.2/0.66
C/L (Ft/m-AGL)			68.0/20.73
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	AML SPECIALTIES, INC		RECEIVE
TRANSMITTER MODEL	GRT3WKMVS18301		ONLY
COMSEARCH INTERNAL ID	300023		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-13.0/0.000050		
RECEIVED LEVEL (dBm)			-45.0
EIRP (dBm/Watts)	34.2/2.6		
FIXED LOSS: TX|COMMON(dB)	0.0| 1.0		0.0| 0.0
FREE SPACE LOSS (dB)		127.4	
TRANSMIT (17,705-18,140)H			
FREQUENCIES			
(MHZ)			

MICSTB = MICROWAVE SATELLITE TECH WOODSIDE

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MICROWAVE PATH DATA

STATION NAME	W 8TH ST NY		BRIGHTWATER NY
PATH STATUS	PROPOSED		
CALL SIGN	WNTM203		
OWNER CODE	MICSTB		MICSTB
LATITUDE (D-M-S) (NAD83)	40 34 43.4		40 34 30.4
LONGITUDE (D-M-S) (NAD83)	73 58 36.5		73 58 26.5
GROUND ELEV (Ft/m-AMSL)	5.0/1.52		5.0/1.52
PATH AZIMUTH (Deg)	149.605		329.607
PATH DISTANCE (Miles)		0.289	
(Km)		0.465	
ANTENNA			
PRIMARY TX	CABLEWAVE SYSTEMS		NOT APPLICABLE
	PA2-190		
ANT CODE	CB0062		
GAIN(dBi)/BEAMWIDTH(Deg)	38.9/1.90		
C/L (Ft/m-AGL)	172.0/52.43		
PRIMARY RX	NOT APPLICABLE		CABLEWAVE SYSTEMS
			PA2-190
ANT CODE			CB0062
GAIN(dBi)/BEAMWIDTH(Deg)			38.9/1.90
C/L (Ft/m-AGL)			208.0/63.40
DIVERSITY RX			
ANT CODE			
GAIN(dBi)/BEAMWIDTH(Deg)			
C/L (Ft/m-AGL)			
EQUIPMENT			
TRANSMITTER MANUFACTURER	AML SPECIALTIES, INC		RECEIVE
TRANSMITTER MODEL	GRT3WKMMT18305		ONLY
COMSEARCH INTERNAL ID	300029		
EMISSION	5M75C3F		
LOADING	1 CH AMV		1 CH AMV
STABILITY (%)	0.000500		0.000500
POWER (dBm/Watts)	-10.0/0.000100		
RECEIVED LEVEL (dBm)			-44.5
EIRP (dBm/Watts)	27.9/0.6		
FIXED LOSS: TX|COMMON(dB)	0.0| 1.0		0.0| 0.0
FREE SPACE LOSS (dB)		111.3	
TRANSMIT (17,705-18,140)H			
FREQUENCIES			
(MHZ)			

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ATTACHMENT - 2

March 20, 2003

Mr. Bill Burhop
IMCC
3004 Oregon Knolls Drive, N.W.
Washington, DC 20015

BY EMAIL

RE: Review of the FCC's PCO Relocation Analysis

Dear Mr. Burhop:

In August and September 2002, the FCC's OET conducted an analysis to determine the feasibility of relocating PCOs from the 18,300 –18,580 MHz segment to replacement spectrum in the 17,740-18,140 and 12,700-13,200 MHz bands. In the Second Order on Reconsideration in IB Docket No. 98-172, the FCC concluded based on this analysis that "sufficient capacity exists in this relocation spectrum to reasonably accommodate most incumbent licensees."[1]

This discussion is based on a review of the CD of information provided by the FCC in response to IMCC's FOIA request and on additional information provided by Don Campbell and Bob Eckert of OET in telephone conversations on March 18, 2003.

Methodology of the FCC Analysis

The input data for the analysis was retrieved from the FCC licensing databases. For 32 cities, microwave path data was retrieved for the bands involved including 12,700-13,200 MHz, 17,700-18,140 MHz, and 18,140-18,580 MHz. The analysis of the input data was performed using a set of unix script files and Fortran routines. Each path using the 18,300-18,580 MHz segment was analyzed against the replacement segments for direct interference cases and also for cases of transmitters being located too close to receivers.

To calculate the potential for direct interference, the FCC first determined if a case under consideration would involve coupling of the interfering and victim antennas within 30 degrees of

[1] Second Order on Reconsideration at ¶ 17.

boresight of each. For such cases, the FCC then calculated a desired to undesired signal ratio (D/U) based on the distance ratio of the interference path to the desired path and the total co-polarized antenna discrimination. The antenna discrimination was based on generic antenna patterns embedded in the Fortran code. "Harmful Interference" was predicted if this D/U ratio was less than 60 dB.

The FCC's criterion for a transmitter being located too close to a receiver is a distance of 0.1 km. For cases that violated this criterion, the FCC reported that shielding between the antennas might have to be installed for interference-free operation, but did not indicate that the frequency was blocked and could not be used.

For each city, the FCC then reviewed the predicted interference cases to determine how many links could be relocated into each replacement band. As a separate category, the FCC also counted the number of cases that might require shielding. A summary was prepared showing the total number of links studied, the number that could not be accommodated in the 17,700-18,140 GHz segment, the number that could not be accommodated in the 12,700-13,200 segment, and the number that could not be accommodated in either. This summary also showed the number that might require shielding in each band.

Input Files

The input files are data extractions from the FCC ULS and COALS databases. For each city there is a pipe-delimited file for each of the segments 12,700-13,200 MHz, 17,700-18,140 MHz, 18,140-18,580 MHz, and above 18,580 MHz.

Source Code

The primary analysis for direct interference is done by the program countem.f and subroutine views.f. Program nearby.f analyzes for co-located transmitters and receivers. The remaining Fortran files are functions and subroutines used by these primary programs. A number of script files are provided to process the input, iteratively run the analysis programs for the various cities, and process and summarize the output.

Output Files

The program countem.f writes the direct interference cases into output file counted.csv. A script translates counted.csv into report.csv. The program nearby.f writes the co-location cases into output file too_close.csv. Scripts pco_review.sh and mw_review scan the report.csv output files and summarize the results by reporting how many paths cannot be accommodated in each band and in either band, and how many cases might require shielding in each band. The FCC provided output files counted.csv, report.csv, and too_close.csv only for Los Angeles as representative results; however, all 32 markets were studied. The FCC's analysis results in table.csv may be interpreted as shown in Table 1.

Of the 1,473 links studied, 9% could not be accommodated in the 17,700 – 18,140 MHz band, 10% could not be accommodated in the 12,700 – 13,200 MHz band, while just 0.27% could not be accommodated in either band.

City	# of PCO Links	# of Links Not Accommodated in 17,700-18,140	# of Links not Accommodated in 12,700-13,200	# of Links not Accommodated in Either	# of Links that Might Require Shielding in 17,700-18,140	# of Links that Might Require Shielding in 12,700-13,200
Albuquerque	4	1	0	0	0	0
Atlanta	8	1	0	0	0	0
Austin	18	1	0	0	0	0
Bloomington	2	0	0	0	0	0
Boise	1	1	1	0	0	0
Boston	8	2	2	0	0	0
Bozman	1	0	0	0	0	0
Buffalo	6	1	0	0	0	1
Baltimore	29	1	2	0	0	0
Chicago	213	10	9	2	5	6
Columbus	1	0	0	0	0	0
Colorado	29	0	3	0	1	2
Denver	30	1	3	0	0	1
Detroit	0	0	0	0	0	0
Dallas	132	6	9	0	0	0
Gainesville	8	0	0	0	0	0
Houston	9	1	1	0	0	0
Lax	156	53	29	0	1	1
Las Vega	18	2	3	0	1	0
Miami	82	0	1	0	0	0
New York City	404	24	36	1	3	3
Portland	20	0	6	0	0	1
Panama City	5	0	0	0	0	0
Philadelphia	101	9	14	0	2	3
Phoenix	87	15	11	0	0	0
San Antonio	12	1	0	0	0	0
Seattle	9	0	1	0	0	0
San Francisco	42	5	10	1	3	0
Salt Lake City	4	0	0	0	0	2
Saint George	4	0	0	0	0	0
Washington DC	29	1	2	0	0	0
Youngstown	1	0	0	0	0	0

Table 3: Results of the FCC Analysis

Analysis of the FCC Study Approach

- The FCC did not take the transmitter power levels into account in their D/U calculations. However, it is important to do so because the AML equipment used by PCOs commonly operates at power levels 20 to 30 dB lower than other microwave systems. Thus digital and FM Video microwave transmitters would cause more interference into AML receivers than the FCC's study identified. Conversely, AML transmitters would cause less interference into digital and FM Video microwave receivers than the FCC's study identified. Therefore we

conclude that the FCC was, to a large extent, considering the wrong interference cases in the analysis. The overall effect in terms of the total number of interference cases is not clear.

- Further, the disparate transmitter power levels result in a significant likelihood that many cases with one antenna with a discrimination angle of greater than 30 degrees would have a C/I less than the FCC's 60 dB criterion. These cases would not have been considered in the FCC's analysis.
- The FCC's analysis does not appear to have considered the emission bandwidth of the radios in the replacement spectrum.
- The FCC did a path-by-path analysis that could result in "hybrid" hubs with both 13 and 18 GHz paths.
- The FCC analysis focused on availability of replacement spectrum but did not address the impact of the 18,300-18,580 MHz licensing freeze on ongoing operations with respect to system modifications and expansion.
- Our February 5 study showed that PCO transmit station WNTZ720 at Shaw Butte, AZ is located within 0.1 km of a number of microwave stations that receive the 17,700-18,140 MHz band. In analyzing the relocation of WNTZ720 to the 17,700-18,140 MHz band, we would have expected the FCC to identify co-location conflicts with paths WLU340-WLW465 and WLS770-WLW451, among others. However, although the Phoenix input data of the FCC study contains the path data necessary to identify these conflicts, the results show no "Links that Might Require Shielding in 17,700-18,140 MHz."

We were unable to deduce the logic of the FCC script routines that summarize the results of the analysis to determine if they:

- Determine if enough spectrum is available in the replacement band to accommodate the total number of displaced channels
- Properly account for the emission bandwidth of the incumbent radios in determining the amount of spectrum impacted
- Look for a contiguous 440 MHz of replacement spectrum

Should you have any questions or require additional information please call me at (703) 726-5681.

Sincerely,

William W. Perkins
Principal Engineer
Spectrum Management Solutions

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Ashburn, VA 20147 USA
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ATTACHMENT - 3

May 5, 2003

Mr. Bill Burhop
IMCC
3004 Oregon Knolls Drive, N.W.
Washington, DC 20015

BY EMAIL

RE: Clarification of our February 5 and March 20 Letters

Dear Mr. Burhop:

This is to clarify several points from our February 5 letter regarding a study of 10 links for relocation to the 17.7-18.14 GHz band and from our March 20 letter regarding a review of the FCC's PCO relocation analysis.

Our February 5 study was based upon the engineering practices of TIA TSB 10-F. Table 1 shows the interference cases identified in this study. Columns of additional information about the interference cases have been added to show the antenna discrimination angles, interference objectives, calculated C/I, and interfering and desired transmitter powers. Based on this table:

- The power level difference between the environment transmitter and proposed AML transmitter ranges from 11 to 39 dB on these cases. A difference of 20 to 30 dB is typical.
- Of the 38 direct interference cases into proposed AML receivers, a study that assumed equal interfering and desired transmitter powers and a 60 dB C/I objective would only have identified 5.
- Of the 38 direct interference cases into proposed AML receivers, 22 involve a discrimination angle from either the interfering or the victim antenna (or both) of more than 30 degrees.

Figure 1 shows the discrimination pattern of the 18 GHz antenna used in the FCC's PCO

relocation analysis. This pattern has a 3 dB beamwidth of about 0.5 degree which is narrower than the 3 dB beamwidth of a 6 foot diameter parabolic antenna. Otherwise the pattern appears similar to the pattern of a 6 foot diameter parabolic antenna.

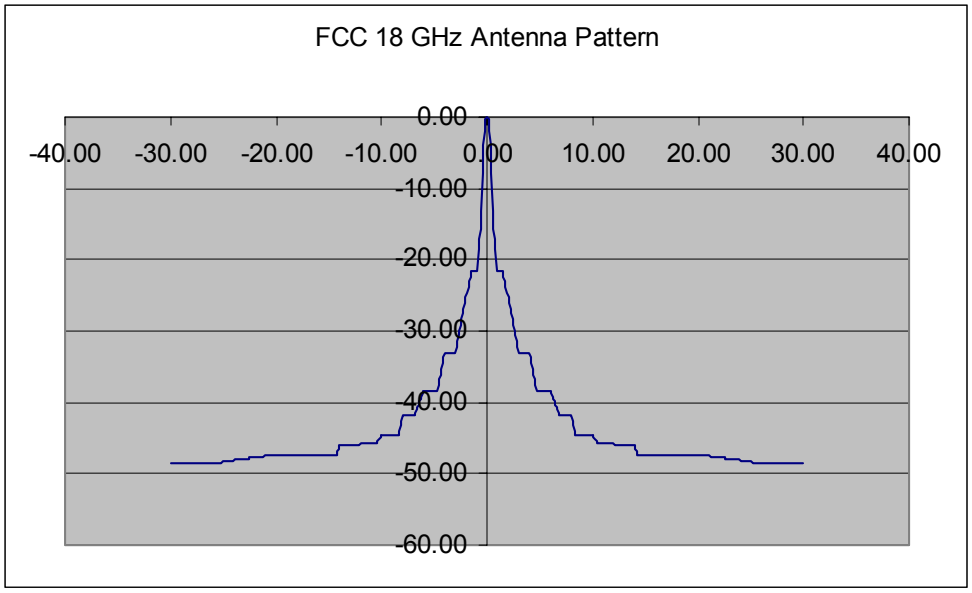

Figure 1: FCC 18 GHz Antenna Pattern

Should you have any questions or require additional information please call me at (703) 726-5681.

Sincerely,

William W. Perkins
Principal Engineer
Spectrum Management Solutions

ATTACHMENT - 3

#	Proposed Path	Inerference Distance (km)	Case Margin (20%) (dB)	Case Margin (0.01%) (dB)	Environment Path Emission Designator	Environment Path Radio Bandwidth (MHz)	Freq1	Pol 1	Freq2	Pol 2	Freq3	Pol3	Freq4	Pol4	Case Type	Environment Antenna Discrimination Angle	Proposed Path Antenna Discrimination Angle	Interference LevelObjective	Actual C/I Calculated by Comsearch (dB)	Power of Interfering Transmitter (dBm)	Power of Desired Transmitter (dBm)	C/I Assuming Equal Transmitter Powers (dB)	Meets 60 dB C/I Objective?
1	Monument Pk - Estancia	**0.4**			40M0F7D	40	17720	V							Into Environment	153.9	327.2	-94.5					
2	Monument Pk - Estancia	**0.3**			20M0F8W	20	17810	V							Into Environment	200.3	328.7	-112.0					
3	Monument Pk - Estancia	**0.3**			20M0F8W	20	18090	V							Into Environment	186.1	328.7	-108.3					
4	Monument Pk - Estancia	24.7	**-2.4**	7.6	28M0D7W	28	17800	V							Into Proposed	3.2	328.7	-107.0	51.8	17.0	-6.0	74.8	Yes
5	Monument Pk - Estancia	6.7	**-32.5**	**-22.5**	28M0D7W	28	17840	H							Into Proposed	0.1	16.3	-107.0	21.7	17.0	-6.0	44.7	No
6	Monument Pk - Estancia	13.2	**-12.4**	**-2.4**	40M0F7W	40	17920	V							Into Proposed	14.5	355	-107.0	41.8	24.0	-6.0	71.8	Yes
7	Fox Plaza - Wilshire SE	37.8	**-13.5**	**-3.5**	40M0G7W	40	17800	V							Into Proposed	2.9	356.5	-107.0	44.1	17.0	-6.0	67.1	Yes
8	Fox Plaza - Wilshire SE	6.4	**-15.3**	**-5.3**	40M0F7W	40	17840	V							Into Proposed	359.8	342.6	-107.0	42.3	5.0	-6.0	53.3	No
9	Fox Plaza - Wilshire SE	15.5	**-2.1**	7.9	10M0F7W	10	17865	V							Into Proposed	348.2	354.7	-107.0	55.5	27.0	-6.0	88.5	Yes
10	Fox Plaza - Wilshire SE	15.1	**-10.6**	**-0.6**	40M0F7W	40	17880	H	18080	V					Into Proposed	55.2	2.5	-107.0	47.0	23.0	-6.0	76.0	Yes
11	Fox Plaza - Wilshire SE	2.1	**-1.5**	8.5	10M0F7W	10	17895	V							Into Proposed	49.8	342.6	-107.0	56.1	27.0	-6.0	89.1	Yes
12	Fox Plaza - Wilshire SE	12.7	**-8.1**	1.9	10M0F7W	10	17915	V							Into Proposed	349.2	349.9	-107.0	49.5	27.0	-6.0	82.5	Yes
13	Fox Plaza - Wilshire SE	12.0	**-2.7**	7.3	10M0F7W	10	17925	V							Into Proposed	13.5	325.6	-107.0	54.9	27.0	-6.0	87.9	Yes
14	Fox Plaza - Wilshire SE	14.3	**-2.7**	7.3	10M0F7W	10	18005	V							Into Proposed	16.2	354.8	-107.0	54.9	18.0	-6.0	78.9	Yes
15	Fox Plaza - Wilshire SE	21.1	**-0.4**	9.6	10M0F7W	10	18035	V							Into Proposed	10.9	354.5	-107.0	57.2	27.0	-6.0	90.2	Yes
16	Fox Plaza - Wilshire SE	12.5	**-17.2**	**-7.2**	10M0F7W	10	18075	H							Into Proposed	0.1	344.3	-107.0	40.4	27.0	-6.0	73.4	Yes
17	Fox Plaza - Wilshire SE	21.1	**-14.3**	**-4.3**	10M0F7W	10	18075	V							Into Proposed	356.9	354.5	-107.0	43.3	27.0	-6.0	76.3	Yes
18	Fox Plaza - Wilshire SE	12.0	**-28.3**	**-18.3**	40M0F7W	40	18080	V							Into Proposed	0	325.6	-107.0	29.3	24.0	-6.0	59.3	No
19	West Med - Park Place	23.6	**-5.0**	5.0	6M30F7W	6.3	17745	V							Into Proposed	282.1	0.4	-107.0	53.0	23.0	-12.0	88.0	Yes
20	West Med - Park Place	8.2	**-2.7**	7.3	40M0F7W	40	17760	V	18000	V					Into Proposed	10	85.5	-107.0	55.3	24.0	-12.0	91.3	Yes
21	West Med - Park Place	4.7	**-6.3**	3.7	10M0F7W	10	17805	V							Into Proposed	354.4	328.1	-107.0	51.7	27.0	-12.0	90.7	Yes
22	West Med - Park Place	8.2	**-1.1**	8.9	40M0F7W	40	17920	H	18120	V					Into Proposed	3.6	85.5	-107.0	56.9	14.0	-12.0	82.9	Yes
23	West Med - Park Place	2.4	**-6.2**	3.8	10M0F7W	10	18005	V							Into Proposed	8.1	287.1	-107.0	51.8	25.0	-12.0	88.8	Yes
24	West Med - Park Place	12.9	**-4.2**	5.8	40M0G7W	40	18040	V							Into Proposed	358.8	285.2	-107.0	53.8	18.0	-12.0	83.8	Yes
25	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	17720	V							Into Environment	136.4	71.9	-97.7					
26	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	17760	H							Into Environment	77.9	107.9	-90.7					
27	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	17760	V	18000	V	18040	H	18080	V	Into Environment	97.2	107.9	-90.6					
28	Shaw Butte - Greenway Spr	**0.0**			40M0F7D	40	17800	V							Into Environment	154.5	335.3	-95.3					
29	Shaw Butte - Greenway Spr	**0.1**			10M0F7W	10	17935	V							Into Environment	190.3	107.9	-102.2					
30	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18000	V	18040	H	18080	V			Into Environment	98.4	107.9	-90.4					
31	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18000	V							Into Environment	299.5	71.9	-97.9					

Table 1: Interference Cases

ATTACHMENT - 3

#	Proposed Path	Inerference Distance (km)	Case Margin (20%) (dB)	Case Margin (0.01%) (dB)	Environment Path Emission Designator	Environment Path Radio Bandwidth (MHz)	Freq1	Pol 1	Freq2	Pol 2	Freq3	Pol3	Freq4	Pol4	Case Type	Environment Antenna Discrimination Angle	Proposed Path Antenna Discrimination Angle	Interference LevelObjective	Actual C/I Calculated by Comsearch (dB)	Power of Interfering Transmitter (dBm)	Power of Desired Transmitter (dBm)	C/I Assuming Equal Transmitter Powers (dB)	Meets 60 dB C/I Objective?
32	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18000	V							Into Environment	246.7	107.9	-91.0					
33	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18080	V							Into Environment	97.2	107.9	-90.9					
34	Shaw Butte - Greenway Spr	**0.1**			40M0F7W	40	18120	V							Into Environment	245.2	107.9	-91.0					
35	Shaw Butte - Greenway Spr	7.8	**-1.1**	7.5	40M0F7D	40	17800	V							Into Proposed	0.2	181	-107.0	61.0	20.0	-9.0	90.0	Yes
36	Shaw Butte - Greenway Spr	3.7	**-3.4**	5.9	40M0F7W	40	17840	H							Into Proposed	199.3	359.9	-107.0	58.7	10.0	-9.0	77.7	Yes
37	Shaw Butte - Greenway Spr	3.8	**-13.3**	**-3.3**	5M00G7W	5	17895	V							Into Proposed	284	358.8	-107.0	48.8	24.0	-9.0	81.8	Yes
38	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	17720	V							Into Environment	136.4	164.1	-97.7					
39	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	17760	H							Into Environment	77.9	200.1	-90.7					
40	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	17760	V	18000	V	18040	H	18080	V	Into Environment	97.2	200.1	-90.6					
41	Shaw Butte - Spring Meadow	**0.0**			40M0F7D	40	17800	V							Into Environment	154.5	67.5	-95.3					
42	Shaw Butte - Spring Meadow	**0.1**			10M0F7W	10	17935	V							Into Environment	190.3	200.1	-102.2					
43	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18000	V	18040	H	18080	V			Into Environment	98.4	200.1	-90.4					
44	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18000	V							Into Environment	299.5	164.1	-97.9					
45	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18000	V							Into Environment	246.7	200.1	-91.0					
46	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18080	V							Into Environment	97.2	200.1	-90.9					
47	Shaw Butte - Spring Meadow	**0.1**			40M0F7W	40	18120	V							Into Environment	245.2	200.1	-91.0					
48	Shaw Butte - Spring Meadow	6.4	**-7.1**	2.9	40M0F7W	40	17840	H							Into Proposed	107.2	360	-107.0	50.4	10.0	-9.0	69.4	Yes
49	Shaw Butte - Spring Meadow	3.5	**-12.1**	**-2.1**	40M0F7W	40	17880	H							Into Proposed	2.1	272.8	-107.0	45.4	23.0	-9.0	77.4	Yes
50	Shaw Butte - Spring Meadow	3.5	**-0.8**	9.2	50M0D7W	50	17880	H							Into Proposed	2.1	272.8	-107.0	56.7	17.0	-9.0	82.7	Yes
51	Shaw Butte - Spring Meadow	6.5	**-8.7**	1.3	5M00G7W	5	17895	V							Into Proposed	193.5	0.5	-107.0	48.8	24.0	-9.0	81.8	Yes
52	Riverside - Huntersglen	3.6	**-9.5**	0.5	40M0F7W	40	18080	V							Into Environment	0.1	358.3	-95.3	46.5	-3.0	18.0	25.5	No
53	Riverside - Huntersglen	26.2	**-38.7**	**-33.5**	40M0G7W	40	17920	V							Into Proposed	359.9	0.5	-107.0	22.3	18.0	-3.0	43.3	No
54	Riverside - Huntersglen	15.7	**-2.0**	8.0	50M0D7W	50	17980	V							Into Proposed	71.5	358.8	-107.0	59.0	20.0	-3.0	82.0	Yes
55	Riverside - Huntersglen	1.1	**-71.4**	**-61.4**	40M0F7W	40	18080	V							Into Proposed	1.7	359.9	-107.0	-10.4	18.0	-3.0	10.6	No
56	Bonaventure - Pear Ridge	24.0	**-3.5**	6.5	40M0F7W	40	17840	V	18080	V					Into Proposed	12.8	2	-107.0	54.7	24.0	-8.0	86.7	Yes
57	Bonaventure - Pear Ridge	24.7	**-5.8**	4.2	40M0F7D	40	17920	V							Into Proposed	5.2	4.2	-107.0	52.4	20.0	-8.0	80.4	Yes
58	W 8th St - Brightwater	37.4	**-7.9**	2.1	20M0F8F	20	17750	V							Into Proposed	16.5	359.7	-107.0	54.6	18.0	-10.0	82.6	Yes
59	W 8th St - Brightwater	8.8	**-3.2**	6.8	40M0F7W	40	17760	V							Into Proposed	144.3	1.2	-107.0	59.3	24.0	-10.0	93.3	Yes
60	W 8th St - Brightwater	**0.2**	**-7.9**	2.1	10M0F7W	10	17785	V							Into Proposed	281.3	46.1	-107.0	54.6	20.0	-10.0	84.6	Yes
61	W 8th St - Brightwater	37.4	**-6.5**	3.5	20M0F8F	20	17790	V							Into Proposed	336.6	359.7	-107.0	56.0	18.0	-10.0	84.0	Yes
62	W 8th St - Brightwater	17.0	**-1.0**	9.0	10M0F7W	10	17845	V							Into Proposed	28.1	2	-107.0	61.5	25.0	-10.0	96.5	Yes

Table 1: Interference Cases (continued)