Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Parts 21 and 74 To Enhance	)	File No. RM-
The Ability of Multipoint Distribution Service	)	
And Instructional Fixed Television Fixed	)	
Service Licensees To Engage In Fixed	)	
Two-Way Transmissions	)	

PETITION FOR RULEMAKING

T. Lauriston Hardin, P.E.
George W. Harter, III
Hardin & Associates, Inc.
1300 Diamond Springs Rd., Suite 600
Virginia Beach, VA 23455
(757) 464-1817

Paul J. Sinderbrand, Esq.
William H. Huber, Esq.
Jennifer A. Burton, Esq.
Wilkinson, Barker, Knauer & Quinn
1735 New York Avenue, NW
Washington, DC 20006
(202) 783-4141

S. Merrill Weiss
25 Mulberry Lane
Edison, New Jersey 08820-2908
(908) 906-0907

Technical Consultants to the Petitioners

Counsel to the Petitioners

March 14, 1997

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Petitioners are a group of over one hundred participants in the wireless cable industry, including The Wireless Cable Association International, Inc., wireless cable system operators, MDS and ITFS licensees who lease channel capacity for wireless cable system use, equipment manufacturers and consultants. By this filing, the Petitioners are proposing revisions to the FCC's rules designed to allow MDS and ITFS licensees to use some or all of their 6 MHz channels for return links from subscribers, to cellularize their transmission systems, and to use subchannels (*i.e.*, the transmission of multiple signals over a single channel) or superchannels (*i.e.*, the transmission of a single signal over multiple adjacent channels) for digital transmissions in either direction. Adoption of the proposed rule revisions is necessary if wireless cable operators and educators are to take full advantage of the MDS and ITFS spectrum in offering the variety of two-way communications services the marketplace is beginning to demand. The proposed rule revisions are set forth in Appendix B, and each revision is accompanied by an explanatory note that provides a detailed analysis of why the specific proposed rule change is requested.

The wireless cable industry is under increasing competitive demand to provide high-speed two-way services to subscribers, such as Internet access. At the same time, the educational community is desirous of securing the high-speed Internet access services that ITFS channels are well-suited to providing. The Commission's rules have always provided MDS and ITFS licensees with the flexibility to offer non-video services. However, while the Commission has long afforded MDS and ITFS licensees access to channels for return path links, those channels are of insufficient bandwidth and are not properly channelized to accommodate contemporary needs.

In crafting the proposed rules, the objective has been to provide maximum flexibility, while at the same time affording BTA authorization holders, incumbent MDS stations and ITFS stations interference protection equivalent to that they receive today. In order to achieve that objective, the proposed interference protection rules are necessarily complex. However, the Petitioners are proposing a variety of regulatory approaches in order to minimize the burden this complexity imposes on the Commission's staff. Most importantly, the proposed interference protection rules are only applicable where neighboring channel rights holders cannot reach an agreement as to the configuration of their systems. Where neighboring interests can agree, the detailed interference analyses called for by the proposed rules can be replaced by simple consents. Where neighbors cannot agree, special application processing rules have been proposed in order to eliminate bottlenecks and expedite the initiation of service to the public.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Parts 21 and 74 To Enhance	)	File No. RM-
The Ability of Multipoint Distribution Service	)	
And Instructional Fixed Television Fixed	)	
Service Licensees To Engage In Fixed	)	
Two-Way Transmissions	)	

To: The Commission

PETITION FOR RULEMAKING

The parties listed on Appendix A hereto (collectively, the "Petitioners")[1/] respectfully request pursuant to Section 1.401(a) of the Commission's Rules that the Commission revise Parts 21 and 74 of its rules in the manner set forth in Appendix B to enhance the ability of Multipoint Distribution Service ("MDS") and Instructional Television Fixed Service ("ITFS") licensees to provide two-way services. More specifically, the proposed rules establish a regulatory framework under which licensees will be permitted to "turn around" all or part of a 6 MHz channel for use as return paths from subscriber premises, to cellularize their transmission systems to take advantage of spectrally efficient frequency reuse techniques, and to employ modulation schemes that require bandwidth either larger or smaller than 6 MHz, all while assuring appropriate levels of interference protection.

[1/] The Petitioners represent a rare grouping of participants in the wireless cable industry and the educational community, including The Wireless Cable Association International, Inc. ("WCA"), most major wireless cable system operators, many MDS and ITFS licensees, MDS Basic Trading Area ("BTA") authorization holders, wireless cable engineering consultants, and manufacturers of wireless cable transmission and reception equipment.

I. INTRODUCTION.

The wireless cable industry is under increasing competitive pressure to provide its subscribers with two-way communications service offerings, such as Internet access. Similarly, there is a growing demand within the ITFS community for improved Internet access, particularly at the higher speeds wireless communications can offer. Although non-video offerings of this sort are generally permissible under the Commission's current rules governing the types of services that can be provided over MDS and ITFS spectrum,[2/] and although a small amount of spectrum has been set aside for MDS and ITFS two-way communications, the Commission's technical rules do not readily accommodate the deployment of the modern digital system designs needed to effectively provide two-way communications services. The Petitoners are not requesting that the Commission allocate additional spectrum for MDS and ITFS return paths; like any spectrum allocation, that process would inevitably be contentious and time consuming. Rather, adoption of the rules proposed in Appendix B will afford MDS and ITFS licensees the flexibility to implement

---

[2/] For purposes of this Petition, the Petitioners will use the phrase "non-video" to refer to information other than the point-to-multipoint entertainment and educational video programming that has been the staple of MDS and ITFS transmissions since the late 1970s. The Petitioners recognize that the Internet, in particular, is becoming an increasingly rich source of video programming with the development of streaming technology, and contemplate that with the adoption of the proposed rules, wireless cable subscribers and students alike will have access to the ever-increasing amount of video programming available over the Internet. *See Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, FCC 96-496, at ¶¶ 99-107 (rel. Jan. 2, 1997)[hereinafter cited as "*1996 Report to Congress*"]; "Action on Streaming Specs Bodes Well for Media-Rich Web Content," *Broadband Commerce and Technology*, at 1 (Nov. 1996).

spectrally efficient digital transmission techniques using their existing channels in order to meet marketplace demand for two-way services.

In crafting the proposed rules, the Petitioners have been well aware that, while the Commission generally favors affording licensees flexibility in the use of their spectrum, that flexibility must be tempered by rules to prevent interference. Gregory L. Rosston and Jeffrey S. Steinberg recently noted in "Using Market-Based Spectrum Policy to Promote the Public Interest" that:

> An authorization to use spectrum is of limited value without an expectation that one's legitimate use of the spectrum will be free from interference by others. Thus, each user of spectrum, like a user of land or any other resource, must sacrifice some degree of unrestricted use so that every other user can enjoy the benefits of spectrum utilization within that user's own defined bounds. The Commission should continue to define the extent to which each spectrum user may expect freedom from interference and enforce rules to protect those expectations. The Commission can and should, however, perform this function in a manner that is minimally intrusive upon users' flexibility. Thus, rules to limit interference should ordinarily be output-based (*e.g.*, limitations on emissions outside the licensed spectrum band and geographic area or sharing criteria) rather than input-based (*e.g.*, specifying permissible services or technologies). So long as a spectrum user's emissions comply with objective numerical standards, it should ordinarily be free to offer whatever services using whatever technologies it wishes.[3/]

The Petitioners agree, and have proposed revisions to the rules that will assure BTA authorization holders, incumbent MDS station licensees and the ITFS community as close as possible to their current levels of protection against interference, while at the same time eliminating many obsolete technical restrictions on the use of the MDS and ITFS spectrum.

[3/] Rosston and Steinberg, "Using Market-Based Spectrum Policy to Promote the Public Interest, at 12-13 (January 1997).

In order to achieve the objective of assuring interference protection, ADC Telecommunications, Inc. ("ADC"), American Telecasting, Inc. ("ATI"), CAI Wireless Systems, Inc. ("CAI"), Pacific Telesis Group ("Pacific Telesis") and People's Choice TV Corp. ("PCTV") retained T. Lauriston Hardin, P.E., and George W. Harter, III of Hardin & Associates, Inc. ("HAA") and S. Merrill Weiss to consult in the development of appropriate technical regulations. Extensive testing was conducted in Tucson, AZ under their joint direction in support of this filing. Annexed hereto as Appendix D is *Rationale for Two-Way & Distributed Transmission Operations of Wireless Cable Systems* (the "*Two-Way Report*"), which includes an analysis of the system topologies likely to be employed as wireless cable system operators and ITFS licensees provide additional services, a report on the results of the Tucson testing of response station interference considerations, and a discussion of their implications for the extensive introduction of two-way communications into the wireless cable environment.

II. DISCUSSION.

A. There Is A Pressing Demand Upon Wireless Cable System Operators And Educators To Provide Two-Way Services That Cannot Be Met Through The Current Allocation Of MDS And ITFS Return Path Spectrum.

1. As A Result Of Convergence, Wireless Cable Operators Will Have To Provide Two-Way Services, Such As Internet Access, In Order To Remain Competitively Viable.

The wireless cable industry stands today at a critical juncture. Twenty-one months ago, almost one hundred members of the wireless cable industry and the educational

community — many of whom are also signatories to this Petition — sought from the Commission a declaratory ruling that would permit MDS and ITFS stations to commence digital operations. The Commission's responsive July 9, 1996 *Declaratory Ruling and Order* in DA 95-1854 (the "*Digital Declaratory Ruling*") has paved the way for wireless cable operators to overcome their chronic shortage of channels by employing digital compression technology, while also promoting the use of digital technology by the educational community.[4/] Admittedly, industry growth since has been limited. As Paul Kagan Associates, Inc., ("Kagan") recently noted that:

> The promise of digital technology at economically viable prices, that left MMDS operators in a holding pattern in 1996, figures to stretch into the first half of 1997 as well. With the notable exception of rural markets, where MMDS ops are positioned as low-priced providers, it continues to make sense not to deploy analog hardware that may quickly become obsolete.[5/]

As Kagan forecasts, however, within the coming months the Commission can expect to see a flurry of digital wireless cable system launches. PCTV, CS Wireless Systems, Inc., BellSouth Corp. ("Bell South") and Pacific Telesis, among others, have all announced plans to launch digital wireless cable systems in 1997.[6/] Indeed, despite the recent decisions by two

---

[4/] *See Request for Declaratory Ruling on the Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations,* Declaratory Ruling and Order, FCC 96-304, DA 95-1854, at 2-3 (rel. July 10, 1996) [hereinafter cited as "*Digital Declaratory Ruling*"].

[5/] *Wireless Cable Investor*, at 8 (Dec. 31, 1996).

[6/] *See, e.g.,* Gibbons, "PCTV's Story: Waiting for Digital," *Multichannel News*, at 54 (Dec. 9, 1996); Barthold, "A Foggy Road Ahead," *Cable World,* at 21 (Jan.27, 1997); Barthold, "Going Digital," *Cable World*, at 22 (Jan. 27, 1997); Breznick, "BellSouth Eyes Atlanta, New Orleans, Miami for '98 MMDS Launches," *Cable World*, at 12 (Dec. 2, 1996).

local exchange carriers to retreat from using wireless cable technology, Kagan anticipates that as many as 5 percent of wireless cable subscribers will be receiving digital service by the end of this year.[7/]

Over the past year, it has become clear that merely providing consumers with more of the same video programming through digitization may not be enough for wireless cable to succeed in the video marketplace. As a result of changing consumer demand and marketplace response, wireless cable operators will have to do more if they are to be viable competitors in the marketplace. Before they can do more, however, further revisions to the Commission's MDS and ITFS regulatory regime are necessary in order to eliminate obsolete technical rules and provide for the use of modern digital network designs.[8/]

Most significantly, the long-anticipated convergence among previously discrete services is now beginning to occur in earnest. A primary objective of the Telecommunications Act of 1996 was to break down artificial regulatory barriers between service providers as a means of "promot[ing] competition . . . in order to secure lower prices

---

Just recently, PCTV and CS contracted with the NextLevel Broadband Networks Group of General Instrument Corp. for 600,000 digital set-top terminals. *See* "GI Strikes $240 Million 'Wireless Cable' Deal," *The Cable-Telco Report*, at 16 (Jan. 27, 1997); Barthold, "GI Wins Order for Wireless Digital Boxes Valued at $240M," *Cable World*, at 38 (Jan. 27, 1997).

[7/] *Wireless Cable Investor*, at 9 (Dec, 31, 1996).

[8/] Indeed, Section 257 of the Telecommunications Act of 1996 mandates that the Commission identify and eliminate market entry barriers for entrepreneurs and other small businesses to promote diversity of media voices, vigorous economic competition, technological advancement and promotion of the public interest. *Telecommunications Act of 1996*, P.L. 104-104, 110 Stat 56 (1996). Adoption of the rules set forth in Appendix B will advance those objectives.

and higher quality services for American telecommunications consumers and encourage the rapid development of new telecommunications technologies."[9/] Wireless cable is beginning to feel the competitive pressures resulting from convergence — pressures to which the industry cannot fully respond due to regulatory impediments.

The public is demanding increasingly higher speed data links for home, business and educational use, particularly to better access the graphics-rich World Wide Web.[10/] Even with the widespread availability of reasonably priced 28.8 Mbps modems, delays in accessing Web pages are driving home, business and educational users to search for higher speed alternatives to the twisted pair wired local telephone loop. As a result, many communications providers that had not previously offered high speed data access are now developing service offerings to meet that demand for a high speed alternative to twisted pair.

At the same time, there is increasingly a convergence between the television monitor and the computer. The *Washington Post* has noted that "digital technology is now capable of making TV sets into receivers of all kinds of electronic information, such as e-mail, print data or paging services, or to be used in serving the Internet."[11/] Blair Levin, Chief of Staff

---

[9/] H.R. Rep. No. 104-204, at 47 (1995).

[10/] *See* Barthold, "Study Sees High-Speed Growth for Modems," *Cable World*, at 32 (Jan. 20, 1997).

[11/] Farhi, "Agreement Removes A Digital TV Obstacle," *Washington Post*, at D1 (Nov. 26, 1996). *See also* McConnell, "Way paved for PCTVs," *Broadcasting & Cable*, at 4 (Dec. 2, 1996); "Cable TV Firms To Test 'PC-Less Internet Access," *The Cable-Telco Report*, at 10 (Nov. 4, 1996)(reporting that Comcast Cable Communications, Inc., Cablevision Systems Corp., Adelphia Communications Corp., Charter Communications, Inc. and a joint venture of US West, Inc., Tele-Communications, Inc. and Cox Communications,

to the Chairman, has eloquently called for "creating a glidepath towards PC and TV convergence, so that the TV of the future can be [an] hospitable, competitively neutral platform to the host of new services and new competition the television industry, and all participants in the communications revolution can bring."[12/]

As a result of these developments, it is apparent that consumers will highly value the ability to secure both video programming and access to the Internet and other sources of data from a single vendor. *Thus, a multichannel video programming distributor that can offer an integrated Internet access service will have a substantial leg up on its competitors, while one that cannot offer such service will be left behind.*

Of most immediate concern to the wireless cable industry, the trade press has been abuzz with stories of the franchised cable industry expanding into a variety of two-way services, particularly Internet access.[13/] As one recent report put it:

Inc. are testing a television set-top device that will allow cable operators to deliver Internet access directly to television monitors, without an intervening computer); Littleton, "PC-TV: threat or promise?", *Broadcasting & Cable*, at 58 (Oct. 28, 1996); "Internet TV Waiting in Wings," *Broadcasting & Cable*, at 31 (Oct. 28, 1996); Barthold, "St. Louis Subscribers To Get World Wide Web Access Via TV," *Cable World*, at 32 (Oct. 29, 1996)("Charter Communications, one of five MSOs that will test WorldGate Communications; TV On-Line (TVOL) Internet-access service, will offer it to as many as 100 subscribers in its St. Louis County, Mo., franchise early next year. TVOL lets subscribers access the Internet and the World Wide Web via their set-top box and a remote control.").

[12/] "DTV: Bridge To The Future Or Bridge Over The River Kwai?", speech of Blair Levin delivered to Citizens for a Sound Economy (Nov. 22, 1996).

[13/] *See, e.g.*, "Wireless Cable Futures," *Wireless Cable Investor*, at 8 (Dec. 31, 1996) ("Cable operators are finally...launch[ing] high-speed access to the Internet"); Landler, "Cablevision Sets Link to Internet For L.I. Viewers," *NY Times*, at D1 (Dec. 17, 1996);

> The cable empire is finally striking back at [its competitors]. Its secret weapon: blisteringly fast access to the Internet, courtesy of the cable modem.[14/]

Broadcasting and Cable has reported that:

> Cable modems are finally moving beyond the hype, and the beginnings of a very real business are quickly taking root in select systems around the country. Major MSOs, including TeleCommunications Inc., Continental Cablevision, Time Warner Cable, Rogers Cablesystems and Comcast Cable, are launching commercially. Estimates on the number of high-speed modems now deployed in North America range as high as 500,000.[15/]

Moreover, cable will not be the only multichannel video programming distributor that is likely to be integrating Internet access and other two-way services with more traditional multichannel video programming services. The Commission has already allocated spectrum to the Local Multipoint Distribution Service ("LMDS"), a service that can be deployed for

---

Dawson, "Comcast Starts High-Speed Data in Md.," *Multichannel News*, at 7 (Dec. 9, 1996); Barthold, "Shopping the Cable Modem Market," *Cable World*, at 37 (Nov. 25, 1996); Breznick, "Prime Cable, Media General Slate Cable Modem Trials," *Cable World*, at 65 (Nov. 22, 1996); Vittore, "TCI Telephony Says It's on Track To Launch in Ill., Calif. This Year," *Cable World*, at 56 (Nov. 22, 1996); Ellis, "Continental Is Latest MSO To Launch High-Speed Data," *Multichannel News*, at 89, 91 (Sept. 23, 1996); Mitchell, "At Continental, Modem Services Are Ready to Roll," *Cable World*, at 1 (Sept. 23, 1996); Breznick, "Telephony, Data Game Plans," *Cable World*, at 22 (filed Sept. 23, 1996); Dawson, "Road Runner Hits the Ground," *Multichannel News*, at 1 (Sept. 16, 1996); Ellis, "@Home Lights Up Network Backbone," *Multichannel News*, at 53 (Sept. 16, 1996); MSOs Move Forward With Cable Modems, *Multichannel News*, at 32A (June 10, 1996); Breznick, "Modem Mania: Most Major MSOs Ready Rollouts by Year's End," *Cable World*, at 28 (June 10, 1996); Tedeso, "Modems: The Great Cable Hope," *Broadcasting & Cable*, at 38-43 (May 27, 1996). *See also 1996 Report to Congress*, at ¶ 108.

[14/] "In Focus," *Cablevision*, at 16 (Oct. 21, 1996).

[15/] Tedesco, "Cable modems move from concept to reality," *Broadcasting & Cable*, at 106 (Dec. 9, 1996).

"video program distribution, two-way interactive video, teleconferencing, telemedicine, telecommuting, and high speed data services."[16/] The sole LMDS system currently operating has announced a beta test of a wireless Internet service, and plans to launch the service commercially during the first quarter of 1997.[17/] Direct Broadcast Satellite services have announced that they will commence providing Internet access by mid-1997.[18/] As recently reported in the trade press:

> Hoping to beat most cable systems to the punch, DBS providers are scrambling to launch their own versions of high-speed data services to home computer users. DirecTv, Primestar Partners, EchoStar Communications Corp., AlphaStar Televisions Network and the News Corp.-MCI Communications Corp. ASkyB venture are seeking to develop low-cost multimedia, enhanced video and Internet services that can be transmitted directly to personal computers.[19/]

[16/] *Rulemaking to Amend Parts 1, 2, 21 and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, CC Docket No. 92-297, FCC 96-311, at ¶ 3 (rel. July 22, 1996). *See also Rulemaking to Amend Parts 1, 2, 21 and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, CC Docket No. 92-297, FCC 97-82, at ¶ 2 (rel. March 13, 1997)("There is sufficient capacity in the proposed LMDS system designs to provide wireless competition to both local exchange carriers (LECs) and cable television systems, even in urban areas.").

[17/] Dawson, "LMDS Aims for '97 Data Push," *Multichannel News*, at 29 (Jan. 6, 1997); "Wireless Bubble Bursts," *Wireless Cable Investor*, at 12 (Dec. 31, 1996).

[18/] *See* Tedesco, "DirecTV, Microsoft gear up direct-to-PC, *Broadcasting & Cable*, at 3 (Jan. 6, 1997); Robichaux, "Once a Laughingstock, Direct-Broadcast TV Gives Cable A Scare," *Wall St. J.*, at A1 (Nov. 7, 1996); Howes, "The Interactivity 'Trick'", *Cablevision*, at 26 (April 15, 1996).

[19/] Breznick, "Data From Outer Space," *Cable World*, at 53 (Dec. 9, 1996).

Of course, as broadcasters convert to digital technology, they too will be positioned to provide Internet access and other data services.[20/] And, just weeks ago, the Commission created the new Wireless Communications Service ("WCS"), a service the Commission envisions as being competitive with both the MDS and the LMDS due to extremely flexible rules that will allow the licensee to provide video, voice and/or data services.[21/]

In light of this changing environment, it is apparent that if wireless cable operators are to survive in the multichannel video programming marketplace, they too must be able to provide a competitive array of interactive communications services. Not surprisingly then, the wireless cable industry has been actively exploring opportunities for providing high speed Internet access and other two-way services, without the need for a contentious and time-consuming reallocation of spectrum.[22/] The Commission has been highly supportive

---

[20/] *See, e.g.*, Farhi, "Agreement Removes A Digital TV Obstacle," *Washington Post*, at D1 (Nov. 26, 1996); McConnell, "Way paved for PCTVs," *Broadcasting & Cable*, at 4 (Dec., 2, 1996).

[21/] *See Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service ("WCS")*, FCC 97-50, GN Docket No. 96-228, at ¶ 63 (rel. Feb. 19, 1997).

[22/] *See, e.g.*, Barthold, "High-Speed Data Dominates Wireless Meeting," *Cable World*, at 58 (Feb. 24, 1997); "Winter Meeting: More and Better Access," *Wireless Cable Investor*, at 4-6)Feb. 26, 1997); Barthold, "The Internet Kicker," *Cable World*, at 26, (Jan. 27, 1997); Breznick and Vittore, "Wireless Internet Access Gaining Steam," *Cable World*, at 18 (Dec. 16, 1996); "American Telecasting Teams With MCI," *Cable World*, at 2 (Oct. 31, 1996)(American Telecasting announced Oct. 15 it has a letter of intent to test high-speed access to the Internet with MCI in several locations . . .."); "CAI Wireless High-Speed Access News," *Wireless Cable Investor*, at 2 (Oct. 31, 1996)("CAI Wireless . . . announced FCC clearance to roll out its Internet and Intranet commercial services to up to 500 homes in Rochester, NY"); "Wireless News," *Cable World*, at 30 (Oct. 28, 1996)("CAI Wireless Inc. asked the FCC to approve two-way communications using its wireless cable channels in

of those efforts. The *Digital Declaratory Ruling* adopted by the Commission last July set the stage by providing for the introduction of the digital technologies that are at the heart of the contemplated two-way services. Since then, the Mass Media Bureau has confirmed that, subject to compliance with the policies established in the *Digital Declaratory Ruling*, a wireless cable operator can utilize MDS and leased excess ITFS capacity for the provision

---

Hartford, Conn. Approval would let CAI use channels for high-speed Internet access, as well as voice and interactive data services such as home shopping and banking."); "Wireless Data Test," *Cable World*, at 53 (Oct. 28, 1996)("American Telecasting Inc. (ATI) and MCI Telecommunications Corp. will test high speed Internet access . . . ."); Gibbons, "MMDS Ops Test High Speed Data," *Multichannel News*, at 14 (Sept. 14, 1996); "Modem alternatives emerge," *Broadcasting & Cable*, at 44 (May 27, 1996)("Although the cable industry is waiting for two-way, high-speed cable modems, National Digital Networks is looking to get into the market first by offering high-speed asymmetrical wireless cable modems."); Gibbons, "Wireless Execs Bullish on Data; Bash, Worry About Cable Ops," *Multichannel News*, at 65 (July 15, 1996)("CAI and NDN detailed a Washington, D.C., project that uses Hybrid's gear to connect 15 schools and businesses to the Internet at asymmetrical speeds of up to 10 megabits per second in the downstream direction."); Deagon, "Phone Industry and TV: Moving Fast, on Plan B," *Investor's Business Daily*, at A10 (June 6, 1996); Naik, "'Wireless Cable' Firm Plans to Boost Speed of Internet Access," *Wall St. J.*, at B16 (May 30, 1996); *Communications Daily*, at 10 (May 24, 1996)("Wireless cable operator CAI has begun testing technology to deliver high speed Internet access via wireless cable"); McConville, "Liberty Cable gets full-service boost," *Broadcasting & Cable*, at 51 (April 8, 1996); *CableFax* (April 1, 1996)("People's Choice said it would use its 28 wireless cable licenses won in the FCC's MDS auction to offer Internet access, data services, and fixed wireless local loop telephony in addition to video programming); Isenberg, "Fast Speeds, Phone Wires, No ISDN," *Digital Media*, at 25 (Feb. 6, 1996)("Certainly, most of today's Internet applications fit ADSL's capabilities perfectly. But here, three new technologies look like competition: cable modems, wireless cable and ISDN."); "Good News: Digital Audio-Visual Council To Publish Digital Specs By End Of Year," *Video Technology News* (Sept. 25, 1995)("DAVIC's plan for the coming year encompasses such areas as . . . data and Internet access services through cable systems and wireless cable."); Berniker, "Microsoft Sees 'Broadcast PC' Evolving Soon," *Broadcasting & Cable*, at 60 (Sept. 18, 1995)("Microsoft is trying to stay flexible by working [with] wireless cable systems to deliver data to PCs . . . .").

of an asymmetrical Internet access service that employs a telephone return link from the subscriber's premises.[23] At the same time, the Mass Media Bureau noted that, "recognizing the potential value of two-way over-the-air Internet service, the Bureau has issued and will continue to issue developmental authorizations for the purpose of evaluating technical approaches, systems and related transmission parameters."[24] And, just recently, the Bureau issued the first regular licenses authorizing two-way operation in the MDS band, albeit ones that individually licensed each subscriber location, an approach that is not commercially viable for most two-way wireless cable applications.[25]

The time has come, however, for the Commission to establish formal rules that will allow MDS and ITFS operators to develop and market interactive services which take full advantage of digital technology, without the limitations, risks and inconveniences associated with short-term developmental authorizations or licenses that only permit service to a small number of individually-licensed receive sites.[26]

---

[23] *See* "The Mass Media Bureau Implements Policy For Provision Of Internet Service On MDS And Leased ITFS Frequencies," *Public Notice*, DA 96-1720 (rel. Oct. 17, 1996) [hereinafter cited as *"Internet Public Notice"*].

[24] *Id.*

[25] *See* Applications of Atlantic Microsystems, Inc., File Nos. BMDP-970115KI through BMDP-970115KM (granted Jan. 27, 1997).

[26] While developmental authorizations have proven helpful for experimental purposes, they do not provide a basis for large scale business development. For example, the developmental authorization recently issued to Atlantic Microsystems, Inc. ("AMI") for two-way services in Hartford, CT is limited in duration to two years, permits service to only 1,000 subscribers, and precludes AMI from charging those customers more than is necessary to defray the cost of constructing and operating the system. *See* Letter from Charles E.

Adoption of the proposed rules requested by the Petitioners will advance the public interest, for it will bolster the competitive viability of wireless cable. The Commission's long-standing goal has been "to facilitate the development and rapid deployment of wireless cable services."[27/] The rationale behind that goal is simple -- the Commission is promoting wireless cable because:

> in providing communications services, the public interest is better served by competition. A competitive industry framework promotes lower prices for services, provides incentives for operators to improve those services and stimulates economic growth.[28/]

The Commission's 1995 report to Congress on the status of competition in the video marketplace acknowledged that "the wireless cable industry has a number of strengths *vis-a-vis* cable" — lower costs of construction, lower costs of upgrading to advanced technology, reduced state and local regulatory burdens, higher picture quality and fewer

---

Dzeidzic, Assistant Chief, Video Services Division, to Gerald Stevens-Kittner, File Nos. 50112-CM-P-97 and 50137-CM-P-97 (Nov. 21, 1996). Similarly, the licenses issued to AMI authorizing permanent two-way services in Boston are limited to sixteen discrete receive sites, and AMI presumably will have to file modification applications in order to serve any sites other than those sixteen. Such a site-by-site licensing approach is commercially impractical, particularly since cable, LMDS, WCS, DBS and others can initiate two-way communications with a given site without prior Commission approval. *See infra* at 26.

[27/] *Amendment of Parts 21 and 74 of the Commission's Rules With Regard To Filing Procedures In The Multipoint Distribution Service and In The Instructional Television Fixed Service*, 10 FCC Rcd 9589, 9591 (1995) [hereinafter cited as "*MDS Auction Order.*"]; *see also Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service*, 9 FCC Rcd 7665, 7666 (1994) [hereinafter cited as "*MDS Auction NPRM*"].

[28/] *Id.*

service outages.[29] Yet, the Commission correctly has recognized on several occasions that wireless cable's ability to effectively compete is hampered by its inability to provide the same range of service offerings as its competition.[30]

With the coming advent of digital compression technology in light of the *Digital Declaratory Ruling,* the wireless cable industry is now poised to devote some of its scarce spectrum to the two-way services the competitive marketplace demands. Digital compression will allow wireless cable operators to provide the same quantity of entertainment programming services as its competitors, while freeing spectrum for the enhanced service offerings the public is beginning to demand. The rules now being proposed by the Petitioners are designed to permit MDS and ITFS licensees to take the steps that the *Two-Way Report* concludes are necessary to provide two-way services without acquiring additional spectrum and without causing harmful electromagnetic interference to neighboring

---

[29] *Implementation of Section 19 of the Cable Television Consumer Protection and Competition Act of 1992: Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, 9 FCC Rcd 7442, 7484-85 (1994).

[30] *See id.* at 7485; *MDS Auction NPRM*, 9 FCC Rcd at 7666-67; *Amendment of Part 74 of the Commission's Rules Governing Use of the Frequencies in the Instructional Television Fixed Service*, 9 FCC Rcd 3360, 3364 (1994) [hereinafter cited as "*Channel Loading Report and Order*"].

facilities.[31] As such, adoption of the proposed rules will advance the Commission's efforts to promote a competitive marketplace.

2. Adoption Of The Proposed Rules Also Will Promote The Goal Of Expanding Internet Access In The Nation's Schools.

The rules proposed by the Petitioners have been carefully designed to benefit not just wireless cable operators, but also America's educational community. As the Commission has made clear on innumerable occasions recently, the Internet is not just a consumer phenomenon, but it is also having a profound impact on the way in which students are taught. It is now beyond peradventure that when properly employed, educational technology improves student performance. The Internet, in particular, holds great promise as an educational tool.[32] As Chairman Hundt recently noted:

---

[31] Although adoption of the proposed rules will afford many wireless cable operators the spectrum they need in order to meet marketplace demand for two-way services, the Commission should recognize that other wireless cable operators will require additional spectrum from time to time. Thus, the Commission should make certain as it allocates spectrum for new service offerings that the rules accommodate incorporation of such spectrum into wireless cable systems, and that wireless cable operators are eligible to secure such spectrum.

[32] *See, e.g.*, Newman, "Courses at your Convenience: A field of college classes grows on the Internet," *N.Y. Times*, Sec. 4A, p.13 (Nov. 3, 1996)("students who are not enrolled full time in such universities, and those who live far away from a particular university, can take their pick of a plethora of courses without ever setting foot on those campuses, if they have access to the Internet or the World Wide Web.");"Education Department Opens Network Operations Center For Bicentennial Internet Project," *Business Wire* (Oct. 2, 1996)("Tennessee will be the first state to connect every one of its public schools to the Internet with some form of high speed graphical connection, making this the largest education network anywhere in the country in terms of the number of routers and the actual number of sites being physically connected to the Internet."); "Georgia District Uses Bond Issue To Fill Schools With Technology," *Education Technology News* (Sept. 24, 1996); Waltz, "Technologies reach beyond the campus: academic institutions implement Internet,

> Access to the world of on-line information and learning really does benefit students. It enhances learning by encouraging students to explore, to think critically, and to take an active role in their own educational adventure.[33/]

The Chairman has also recognized that:

> Teachers and educators know far better than I that there are many steps to success in using technology in education. You know as well as I that computers and connections to the Internet are vital to our journey. . . . Access to the Internet could provide even the poorest school with the resources of the world's libraries. E-mail would allow frequent contact between students, teachers and parents.[34/]

As the *Washington Post* reported just last month:

> The biggest cheerleader for the digital classroom has been the Clinton administration. In last year's State of the Union address, President Clinton pledged to have every school in the nation wired to the Internet by the year 2000. A month later he announced a five-year, $2 billion federal program to put Internet-ready computers in all of America's classrooms; including state and local spending, Clinton estimated that the entire cost of the program would be $10 billion. "Our country is changing just as profoundly as it did when we moved from farm to factory, from the country to the cites and town 100 years ago," Clinton told a crowd at Ygnacio Valley High School in Concord, Calif., last year. "We know, purely and simply, that every child must have access to a computer . . . yes, to the Internet, so that every person will have the opportunity to make the most of his or her own life."[35/]

---

other mobile technologies," *MacWeek*, at 22 (Oct. 14, 1996); Tompkin, "Networking is Pupils' Latest Tool When They're On-Line; Pupils Find Networking The Way To Go," *Chicago Tribune*, at 17 (Oct. 27, 1996); Hostetler, "Oracle Software May Graduate To K-12 School," *Investor's Business Daily*, at A6 (Oct. 28, 1996);

[33/] Remarks of Reed Hundt at Murch Elementary School, at 1 (Oct. 16, 1996).

[34/] Remarks of Reed Hundt, Technology and Learning Conference, National School Board Association, Dallas, TX (Oct. 24, 1996).

[35/] Virshup, "Surfing Tidal Wave," *The Washington Post Magazine*, at 10, 12 (Feb. 2, 1997).

Low-speed access to the Internet, however, is not enough. The Administration, for example, has established the goal of affording Internet access with "an increased ability to handle real-time, multimedia applications such as video-conferencing and "streams" of audio and video — very important for . . . distance education."[36/] It has been recognized that through high-speed Internet access:

> Universities are now experimenting with technologies such as two-way video to remote sites, VCR-like replay of past classes, modeling and simulation, collaborative environments, and online access to instructional software. Distance education will improve the ability of universities to serve working Americans who want new skills, but who cannot attend a class at a fixed time during the week.[37/]

By adopting the rules proposed in this Petition, the Commission will advance the national goal of providing the nation's schools with the high-speed access to the Internet necessary to accomplish these objectives. The proposed rules set forth in Appendix B have been carefully crafted to provide all ITFS licensees — whether or not they lease excess capacity for wireless cable operations — to take advantage of the potential that digital technology offers for using ITFS channels to deliver high speed, two-way Internet access.

[36/] "Background on Clinton-Gore Administration's Next-Generation Internet Initiative: Qs and As on Next-Generation Internet Initiative," *Office of the Vice President*, at 4 (rel. Oct. 10, 1996).

[37/] *Id.* at 2.

B. Although The Commission's Rules Permit MDS And ITFS Licensees To Provide Two-Way Non-Video Communications, The Technical Rules Are Inadequate To Meet Evolving Needs.

Before turning to the specific rule revisions being requested by the Petitioners, it is important to emphasize what the Petitioners are not seeking — they are not seeking any significant change in the uses to which MDS and ITFS channels can be put. As will be demonstrated below, the Commission's Rules have long provided MDS and ITFS licensees with the flexibility to provide non-video services, and the Commission has afforded MDS and ITFS licensees access to channels for return path links. What this Petition primarily seeks is a series of technical rule changes designed to allow MDS and ITFS licensees the flexibility to employ modern digital technology in delivering the two-way, non-video services they are currently authorized to provide.

The Petitioners envision that two somewhat different technological approaches will be employed to provide two-way service offerings — one that uses telephone links to provide the return path from the subscriber's premises, and another that uses MDS and/or ITFS channels that are turned around in whole or in part for transmissions from the

subscriber's premises.[38/] Each approach has proven viable in testing.[39/] The *Two-Way Report* describes in detail the various system topologies that wireless cable operators may employ when introducing advanced digital techniques. The Petitioners believe that these approaches will all be deployed, with the selection for any given market being based on local market conditions, the business plan of the wireless cable operator and the needs of the local educational community. Thus, the rules proposed by this Petition are designed to accommodate whatever approach best meets marketplace demand by affording licensees increased flexibility to implement wireless return paths and/or to employ cellular point-to-multipoint digital transmission techniques designed to enhance spectral efficiency and the opportunities for spectrum reuse.

[38/] Similar approaches are being considered by the cable industry. *See e.g.*, Breznick, "@Home Exploring 1-Way Modems and Set-Top Boxes for Data Delivery," *Cable World*, at 1 (Feb. 3, 1997); Barthold, "Cable Still Split on the Best Way to Deliver and Retrieve Deal," *Cable World*, at 198 (Dec. 9, 1996); Ellis, "Scientific-Atlanta introduces telephone-return cable modem, *Multichannel News*, at 61 (Nov. 4, 1996) ("S-A's plans are for an ongoing wave of cable-modem products — starting with the Telco-return model, and then adding in RF return units next year — as operators activate 2-way plant.").

[39/] *See, e.g.* Gibbons, "Wireless Execs Bullish on Data; Bash, Worry About Cable Ops," *Multichannel News*, at 68 (July 15, 1996); (Asymmetrical systems have demonstrated speeds of up to 10 megabits per second in the downstream direction); Colman, "Wireless modems in the fast lane," *Broadcasting & Cable*, at 12 (July 1, 1996)(employing a microwave return path, "the modems demonstrated they were capable of transferring data at speeds of 500 kilobits per second. That's substantially higher than ISDN-enabled telephone line speeds of 128 kbps.").

1. The Commission's Rules Afford MDS And ITFS Licensees The Flexibility To Transmit Other Than Traditional Video Programming.

For the reasons discussed in the *Two-Way Report*, the rule revisions set forth in Appendix B are necessary to provide MDS and ITFS licensees the flexibility they need in order to fully deploy digital two-way communications and distributed transmission technologies in satisfaction of market demand. The Commission should recognize, however, that although the rules presently governing MDS and ITFS have their genesis in proceedings commenced long before the development of the digital modulation schemes that make the contemplated two-way communications viable,[40/] the use of MDS and ITFS channels for the transmission of non-video programming is clearly permissible under the Commission's Rules. Indeed, the use of MDS channels for non-video applications was anticipated by the

---

[40/] *See, e.g. Amendment of Parts 2, 6, 7, 9, 10, 11, 16 and 21 of the Commission's Rules to Designate Portions of the 2110-2200 Mc/s Band Exclusively for the Use of Domestic Fixed Public Stations and for the Use of Operational Fixed and International Control Stations and to Reserve a Portion Thereof for Omnidirectional Operations*, 39 F.C.C. 834 (1962); *Amendment of Part 74, Subpart I of the Commission Rules and Regulations Governing Instructional Television Fixed Stations to provide for the Licensing of ITFS Response Stations in the Band 2686-2690 Mc/s*, 18 F.C.C.2d 603 (1969); *Part 21, Section 21.703(g) and (h) of the Commission's Rules*, 47 F.C.C.2d 957 (1970); *Amendment of Part 74, Subpart I of the Commission's Rules and Regulations Governing Instructional Television Fixed Stations to Provide for the Operation of Low Power Relay Stations (Translators or Boosters)*, 29 F.C.C.2d 192 (1971); *Amendment of Parts 1, 2, 21 and 43 of the Commission's Rules and Regulation to Provide for Licensing and Regulation of Common Carrier Radio Stations in the Multipoint Distribution Service*, 45 F.C.C.2d 616 (1974); *Amendment of Parts 21, 74 and 94 of the Commission's Rules and Regulations With Regard to the Multipoint Distribution Service, the Instructional Television Fixed Service and the Private Operational-Fixed Microwave Service (OFS)*, 45 Fed. Reg. 29,350 (May 1, 1980)[hereinafter cited as "*Gen. Docket No. 80-113 NPRM*"].