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DIRECTOR

Mr. Andrew S. Fishel  
Managing Director  
Federal Communications Commission  
1919 M Street, N.W.  
Washington, D.C. 20554

Dear Mr. Fishel:

Today we have filed on behalf of the Association of Maximum Service Telecasters, Inc. ("MST"), the attached Petition for Inquiry captioned, "Degradation of Television Broadcast Service." This Petition is a wide-ranging request for Commission inquiry into the general subject of interference to television from other radio users and how the FCC's decision making process can be improved to better protect the technical quality of television broadcasting.

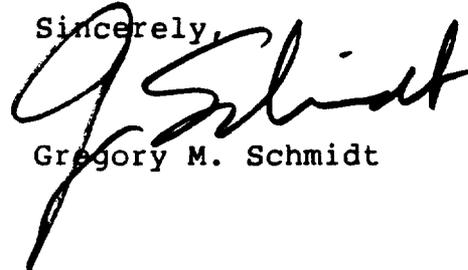
In passing, the petition refers to or describes elements of the following proceedings, which appear to be still pending: MM Dkt. No. 85-251; Gen. Dkt. No. 85-172; Gen. Dkt. No. 84-1234; Gen. Dkt. No. 87-389; MM Dkt. No. 86-96; MM Dkt. No. 87-268; MM Dkt. No. 86-144; Gen. Dkt. No. 88-566; MM Dkt. No. 88-376; MM Dkt. No. 86-144; MM Dkt. No. 86-112; MM Dkt. No. 87-121; Gen. Dkt. No. 88-372; and *Commission Policy Regarding Terrain Shielding*, 3 F.C.C. Rcd. 2664 (1988).

In keeping with the general and comprehensive nature of the Petition, the discussions of these proceedings are descriptive, summary, and de minimis. In no case does the Petition reargue the merits of any proceeding or provide information not contained in MST's comments in those proceedings. Accordingly, it does not appear that the Petition constitutes an ex parte communication in any of these proceedings.

Mr. Andrew S. Fishel  
October 4, 1989  
Page 2

If you have any questions, please contact the undersigned. MST will, of course, continue to cooperate with you, including providing or filing any additional copies of the Petition you deem necessary or desirable.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Schmidt". The signature is fluid and cursive, with a long, sweeping tail that extends downwards and to the left.

Gregory M. Schmidt

Enclosure

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of )  
 )  
Degradation of Television )  
Broadcast Service )  
\_\_\_\_\_ )

To: The Commission

PETITION FOR INQUIRY

ASSOCIATION OF MAXIMUM  
SERVICE TELECASTERS, INC.

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October 4, 1989

## SUMMARY

The ability of television broadcasters to serve the public depends upon television signals being adequately protected against interference. This Petition catalogs the many kinds of interference currently plaguing television service. It then requests that the Commission initiate an inquiry into the subject of ameliorating the deterioration in the quality of television broadcast service that has resulted from decisions permitting higher levels of interference. Such action is necessary to protect the valuable public resource represented by the nationwide system of free, local, and universal over-the-air television service.

The proliferation of multiple forms of interference from nontelevision sources has created, or will soon create, an ambient level of interference to television signals that threatens the economic viability of off-the-air television service in the United States. The public interest problem is one of cumulative interference from multiple sources rather than incremental interference from a single source. Repeatedly, the Commission's tolerance of increased interference levels has been justified as being essential to permitting the introduction of a new radio service or the expansion of an existing service. This need is weighed against the incremental -- as opposed to cumulative -- degradation of the service provided by stations on one or more television channels. Viewed independently, each proposal may

not have universal or devastating interference consequences. But the cumulative effect of numerous proposals can be severe. Like the AM bands, the portion of the spectrum allocated to television broadcasting has become a dumping ground for electromagnetic pollution.

The Commission has never clearly articulated the framework by which it purports to make decisions on matters affecting the ambient level of nontelevision-to-television interference. Instead, the Commission has approached these controversies on an ad hoc basis. The absence of a comprehensive policy to prevent cumulative interference has caused the public to suffer loss or impairment of service and undermines the economic viability of free television service.

The Commission should seek comment on how it might better regulate existing and proposed nontelevision uses of the spectrum that interfere with the public's television service. It should seek to identify the appropriate measure or measures of such interference. It should seek comment on how technological advances in consumer electronics and rising consumer expectations regarding aural and visual clarity in programming should shape the regulation of interference to television. And it should solicit comment on the advantages and disadvantages of each of four regulatory models outlined in the Petition, with the objective of articulating the most feasible and efficacious regulatory scheme to adopt.

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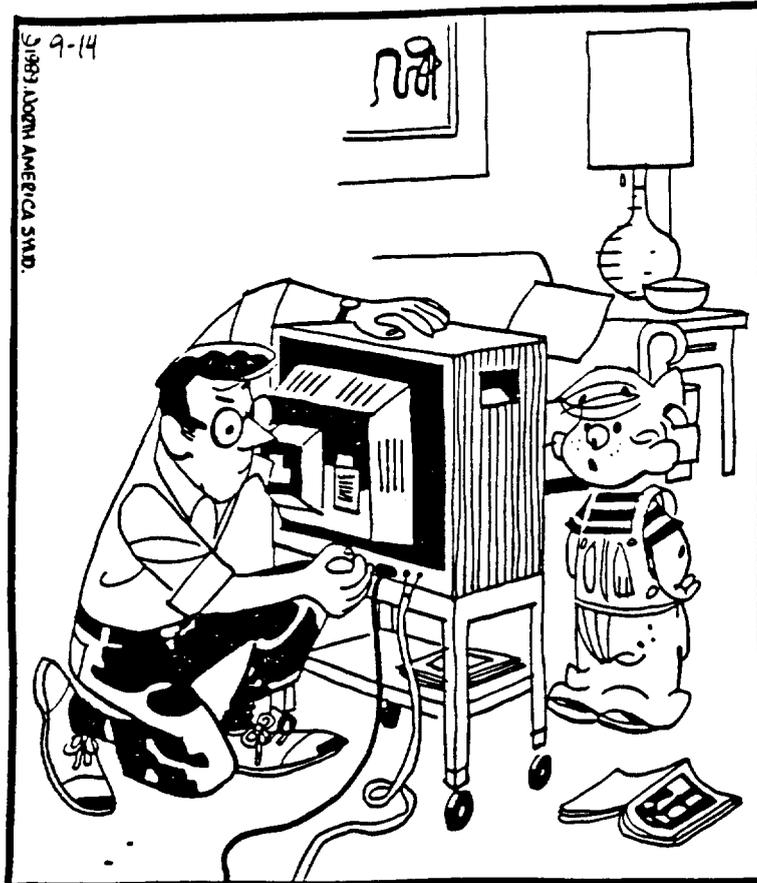
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# DENNIS THE MENACE



"EVEN THE INTERFERENCE ISN'T COMING  
IN VERY GOOD."

"DENNIS THE MENACE © used by  
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(c) by North America Syndicate."

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of )  
 )  
Degradation of Television )  
Broadcast Service )  

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PETITION FOR INQUIRY

This petition asks the Commission to initiate an inquiry into the subject of restoring and protecting the integrity of television broadcast service. The petitioner, the Association of Maximum Service Telecasters (MST), is an organization of some 250 local television stations of all kinds -- VHF and UHF, commercial and public, network affiliated and independent, large market and small. For over 30 years it has been dedicated to preserving and improving the nationwide system of free, local, and universal over-the-air television based on local stations providing their communities with service of high technical quality. Broadcasters' ability to serve the public depends upon the quality of their signals. Even in communities where the ultimate television access to the home is by cable, the quality of the sound and picture depends on there being an original off-the-air signal that is received free of serious interference.

The subject of this petition is one that has been at the heart of broadcast regulation since its very inception. Congress created the Federal Radio Commission in 1927 in order

to eliminate interference that threatened to deny the public the benefits derivable from the orderly commercial development of a valuable public resource -- namely, the electromagnetic spectrum. By subsequently enacting the Communications Act in 1934 and conferring broad rule making authority on the Federal Communications Commission, Congress created the means by which to channel compatible uses of the spectrum, and to prohibit incompatible uses, in a manner that maximizes the benefit to the public interest.<sup>1/</sup> Chairman Sikes recently testified before Congress that "ensuring quality service to the public while minimizing interference . . . is [an] area of renewed FCC emphasis."<sup>2/</sup> Although the Commission's jurisdiction today obviously encompasses a broader range of issues than merely the prevention of interference, these other missions are ancillary to the agency's first duty to be "a kind of traffic officer" of the electromagnetic spectrum so that mutually exclusive spectrum users do not produce a socially wasteful cacophony.<sup>3/</sup> It is on that fundamental duty owed the public by the Commission under the Communications Act that MST bases

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<sup>1/</sup> See *FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 474 (1940); *National Broadcasting Co. v. United States*, 319 U.S. 190, 212-17 (1943) [hereinafter *NBC*].

<sup>2/</sup> Hearings on FCC 1990-91 Reauthorization before the Subcomm. on Telecommunications and Energy of the House Comm. on Energy and Commerce, 101st Cong., 1st Sess. (Sept. 14, 1989) (remarks of Chairman Alfred C. Sikes).

<sup>3/</sup> *NBC*, 319 U.S. at 215.

its request that the Commission initiate an inquiry into ameliorating the degradation of television broadcast signals.

MST does not ask the Commission to revisit its long-standing policies for preventing interference to television service from other television stations. Rather, the focus of this Petition is the need for Commission action to control interference from the expanding number of new non-television spectrum uses. In Part I of this Petition, MST explains the nature of spectrum usage by the television broadcasting industry and identifies various sources of interference for television signals, both generically and as they affect each VHF and UHF television channel and vital auxiliary frequencies. In Part II, MST argues that the proliferation of these multiple forms of interference has created, or will soon create, an ambient level of cumulative interference to television signals that threatens the economic viability of free, local, and universal off-the-air television service in the United States. In Part III, MST shows that the Commission currently lacks a comprehensive policy for preventing the significant degradation of television broadcast signals. In Part IV, MST presents questions, upon which the Commission should seek comment, that would illuminate how the FCC might better regulate existing and proposed spectrum uses that interfere with television broadcasts.

I. THE NATURE OF SPECTRUM USAGE FOR TELEVISION BROADCASTING AND THE SOURCES OF INTERFERENCE.

A. Allocation, Allotment, and Assignment of Spectrum for Television Broadcasting.

The regulation of broadcast television spectrum is subject to three important but conceptually distinct regulatory determinations: spectrum allocation, channel allotment, and license assignment. Each of these determinations has ramifications for the integrity of television broadcast signals.

1. Allocation.

Spectrum has been allocated to broadcast television through rule makings in which alternative spectrum uses have been evaluated and compared and a public interest division of the available spectrum is made among them. Three large bands of spectrum have been allocated to television, two in the VHF band (54-88 MHz and 174-216 MHz) and one in the UHF band (470-806 MHz). Current television channels are 6 MHz wide, so the VHF band in theory can accommodate 12 channels and the UHF band 55 channels.

In addition, television stations need spectrum to receive live or recorded programming (from networks, syndicators, or other stations), to transmit programming from their studios to their transmitters, and for electronic news-gathering. Television stations, as we know them today, could not operate without secure, non-degraded access to these frequencies. And broadcasters' reliance on them to continue to upgrade the quality and diversity of their services can be

expected to increase in the future. The FCC has allocated spectrum in the 2 GHz, 6 GHz, and 12 GHz bands for these auxiliary purposes.

These allocation decisions are not permanent and irrevocable. They can be and are revisited and revised to accommodate technological, social, and economic change and shifting perceptions of the relative public interest importance of differing spectrum uses. Thus early on, television broadcasters lost VHF Channel 1 to the Defense Department and amateur radio operators; later, television broadcasters lost UHF Channels 70-83 to such uses as cellular telephone, business mobile radio, and public safety mobile communications. More recently, television broadcasters lost an auxiliary channel in the 2 GHz band to the radio determination satellite service.

One major effort to reallocate broadcast channels is the UHF/land mobile sharing proceeding. Private land mobile service, which represents the bulk of business and local governmental mobile radio users, in 1970 successfully obtained one or two broadcast channels in the Channels 14-20 band in 13 major markets.<sup>4/</sup> The Commission was also persuaded to put in

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<sup>4/</sup> *Geographic Reallocation of VHF-TV Channels 14 Through 20 to the Land Mobile Radio Services for Use Within the 25 Largest Urbanized Areas of the United States*, 23 F.C.C.2d 325, 337 (1970) [hereinafter *Reallocation of Channels 14 Through 20*].

"reserve" broadcast Channels 70-83.<sup>5/</sup> More recently, the Sheriff of Los Angeles County persuaded the Commission to give him Channel 16 for mobile communications, thereby displacing two pending applications to a higher UHF channel.<sup>6/</sup> In an attempt to satisfy land mobile's demand for spectrum, the Commission proposed in 1985 to reallocate from two to six additional broadcast channels in selected major markets.<sup>7/</sup> Broadcasters have challenged the proposal on the grounds that land mobile is not using its current spectrum fully or efficiently; that the proposed standards for protecting against interference are inadequate; and that the broadcast industry needs this spectrum for high definition television (HDTV). The Commission has put this proceeding "on hold" until it can make at least a preliminary determination as to the broadcast industry's need for this spectrum to implement HDTV.

Allocations are not necessarily exclusive to a particular service. Television broadcasting is a "primary" user of the VHF and UHF bands, but there are numerous "secondary" users of the same frequencies. The secondary users must protect the primary user from interference in the

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<sup>5/</sup> *Spectrum Space for Land Mobile Services (First Report and Order)*, 19 R.R.2d 1663, 1664 (1970).

<sup>6/</sup> *Report and Order, MM Dkt. No. 85-251*, 2 F.C.C. Rcd. 6077 (1987).

<sup>7/</sup> *Notice of Proposed Rulemaking (Gen. Dkt. No. 85-172)*, 50 Fed. Reg. 25587 (June 20, 1985). See also *Further Sharing of the UHF Television Band by Private Land Mobile Radio Services*, 2 F.C.C. Rcd. 6441 (1987).

primary user's protected service area. For example, certain types of field sensor security systems are authorized to use the lower VHF band (Channels 2-6), subject to certain restrictions to assure they do not cause "harmful interference" to television stations operating on the same frequencies.<sup>8/</sup> Broadcast auxiliary channels are shared with a variety of co-primary users (such as cable auxiliary services and industrial, scientific, and medical equipment) and secondary users.

In recent years, the Commission has authorized numerous low-power services to use broadcast channels and broadcast auxiliary channels on a secondary, "non-interference" basis and has added co-primary users such as cable systems to broadcast auxiliary bands.<sup>9/</sup> In addition, the Commission has permitted non-communications devices to emit spurious radiation on broadcast frequencies -- again, generally on a "noninterference" basis. Recently, for example, the Commission granted the applications of the land mobile satellite consortium to use broadcast auxiliary and cable relay spectrum in the 12 GHz band for feeder up-

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<sup>8/</sup> 47 C.F.R. § 15.311(b).

<sup>9/</sup> Report and Order, BC Dkt. No. 78-253, 47 Fed. Reg. 21468 (May 18, 1982); Flexible Operational and Licensing Procedures for the Broadcast Auxiliary Services, Part 74, Subparts D, E, F, and H; and the Cable Television Relay Service Part 78, 2 F.C.C. Rcd. 7541 (1987).

linking.<sup>10/</sup> Broadcasters have opposed this proposal on the grounds that these operations could interfere with auxiliary operations for television broadcasts. Also pending is a proposed major overhaul of Part 15, the portion of the Commission's rules that governs radio frequency (RF) emissions from noncommunications equipment.<sup>11/</sup> Broadcasters have demonstrated that, in redesigning the rules and promoting the use of such devices, the Commission's current proposal will increase television interference.

2. Allotment.

Television channels are not assigned on a "first-come-first-served" demand basis but are allotted through rule making to specific cities and towns and listed in a comprehensive national Television Table of Allotments.<sup>12/</sup> These allotments are based in the first instance on mileage separation rules, which have the effect of establishing maximum interference levels from other television stations. For example, depending on the region of the country,

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<sup>10/</sup> *Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services*, 4 F.C.C. Rcd. \_\_\_\_ ¶ 64 (released Aug. 4, 1989).

<sup>11/</sup> *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License (First Report and Order)*, 4 F.C.C. Rcd. 3493 (1989) [hereinafter *Revision of Part 15*].

<sup>12/</sup> 47 C.F.R. § 73.606.

co-channel stations cannot be located less than 155 to 220 miles from each other;<sup>13/</sup> adjacent-channel stations (for example, Channels 3 and 4) cannot be located within 55 miles of each other.<sup>14/</sup> Once a channel is allotted to a particular community, any station operating on that channel must provide a minimum level of service quality to its designated "community of license."

Within the confines of the mileage separation rules, allotments to particular cities and towns have been based largely on population and the availability of other television outlets. Other things being equal, a larger city will fare better than a smaller one in the number of stations, although the rules are weighted toward seeing that even relatively small cities are able to obtain at least one local station.<sup>15/</sup>

The Table of Allotments can be amended by rule making to accommodate new stations. For example, the FCC recently allotted Channel 11 to Reno, Nevada, rejecting requests that the channel be allotted to Redding,

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<sup>13/</sup> 47 C.F.R. § 73.610(b).

<sup>14/</sup> 47 C.F.R. § 73.610(c)(1).

<sup>15/</sup> Allotments are also divided between commercial and noncommercial uses. There are approximately 1900 allotted channels nationwide, 670 VHF operating stations and 740 UHF stations, 1070 commercial stations and 325 noncommercial stations. Unlike FM radio, the noncommercial allotments in television are not confined to one part of the allocated spectrum, though the vast majority of noncommercial allotments are in the UHF band.

California.<sup>16/</sup> There is, however, virtually no room in the VHF band and very little UHF spectrum in the top markets for additional conventional full-power stations.

3. Assignment.

Once a particular channel is allotted to a particular community, a station license is assigned to a specific entity. Applicants must propose transmitter sites that meet the minimum-mileage separations. As explained below, these mileage-separation rules are "go/no-go": If an application meets the minimum-mileage requirement, then the Commission will not consider any arguments against the application based on alleged interference or loss or gain of service; if, on the other hand, the application does not meet the minimum separations, it is generally rejected, although it has been MST's experience that the Commission customarily entertains 15 to 30 waiver requests annually.

As part of its proceeding looking towards the possible allocation of UHF and VHF spectrum to HDTV, the Commission has put a "freeze" on all new applications for UHF spectrum within 150 miles of the top 30 television markets.<sup>17/</sup> The Commission has also put a freeze on additional

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<sup>16/</sup> Report and Order, MM Dkt. No. 86-96, 2 F.C.C. Rcd. 6962 (1987).

<sup>17/</sup> Advanced Television Systems and Their Impact on Existing Television Broadcast Service, 3 F.C.C. Rcd. 6520, 6532-33 ¶ 96 (1988) [hereinafter ATV Tentative Decision].

applications (and allotments) for Channels 14 and 69 until it resolves the problem of adjacent-channel interference from and to private land mobile operations.

B. Sources of Interference: Television-to-Television.

One source of potential and actual interference to a television station is from other television stations operating on the same or nearby channels. This category of interference is not the object of this Petition. However, it is an appropriate starting point for discussion because it places in perspective the problem of interference from nontelevision sources.

1. Mileage-Separation Rules and Primary Service Areas.

As noted above, the FCC controls television-to-television interference by restricting the power of television station transmitters, their height above ground, and the distance between them. For the VHF band, minimum distances are specified for co-channel and adjacent-channel stations.<sup>18/</sup> UHF allotments are subject to these same restrictions and are also subject to interference "taboos," which require separations for the second, third, fourth, fifth, seventh, eighth, fourteenth, and fifteenth adjacent-channel stations.<sup>19/</sup> Because of the separation requirements, generally no more than

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<sup>18/</sup> 47 C.F.R. § 73.610(a) & (b).

<sup>19/</sup> 47 C.F.R. § 73.610(d).

seven of the 13 possible VHF channels, and six to ten of the 55 possible UHF channels, are available in even the largest markets.

The objective of the mileage-separation rules is to protect the public's service received from its local or area stations. This service is defined in terms of principal-city service area, the Grade A service area, and the Grade B service area. Significantly, service areas are based on signal strengths predicted from statistical models derived from field measurements of actual signal performance. Actual coverage of any particular transmitter can deviate substantially from the predicted performance as a result of terrain, time-of-day, seasonal, and atmospheric conditions.

2. The "Go/No-Go" Application Process.

The mileage separation rules are applied first at the allotment stage. The central "reference points" of the communities of license of co-channel stations must meet the minimum-mileage rules. If they do not, there must be acceptable transmitter sites which do meet the rules and from which principal-city service quality could be provided to the communities of license. But the rules are also applied at the application stage -- that is, each individual application also must meet the minimum spacings specified by the rules.

As applied to applications, the minimum mileage rules are "go/no-go": either the applications meet the minimums or they are rejected. At one time, the FCC evaluated each application on its individual merits, including

assessments of the local geography, the number of people who would receive new service versus those who would be deprived of existing service by interference from the new station. To expedite the process of getting new stations on the air and to protect existing stations, the Commission adopted the current "go/no-go" process, which attempts to remove television interference issues from the licensing process.<sup>20/</sup>

Despite the beneficial certainty provided by the mileage-separation rules, the FCC has permitted waivers under certain narrowly prescribed circumstances. Waivers have been granted where there would be a relatively small short spacing,<sup>21/</sup> where a suitable transmitter site was unavailable,<sup>22/</sup> and where an appropriate public interest showing was made,<sup>22/</sup> and then only if the applicant proposed to use a directional antenna to reduce interference to the station to which it would be short-spaced.<sup>23/</sup>

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<sup>20/</sup> *Basic Media, Ltd., v. FCC*, 559 F.2d 830 (D.C. Cir. 1977).

<sup>21/</sup> E.g., *Caloosa Television Corp.*, 4 F.C.C. Rcd. 4762 (1989).

<sup>22/</sup> E.g., *Parie Television Corp.*, 1 F.C.C. Rcd. 1167 (1986).

<sup>22/</sup> See, e.g., *New VHF Stations in the Top 100 Markets (Report and Order)*, 81 F.C.C.2d 233 (1980).

<sup>23/</sup> See *Review of Technical and Operational Regulations of Part 73, Subpart E, Television Broadcast Stations*, 4 F.C.C. Rcd. 2004, 2007-08 ¶¶ 24-29 (1989). Cf. *Amendment of Part 73 of the Commission's Rules to Permit Short-Spaced FM Station Assignments By Using Directional Antennas*, 3 F.C.C. Rcd. 1820 (1988).

3. Low-Power Television Stations.

As noted earlier, because of the mileage-separation rules only a small fraction of the channels may be used for full-power stations in each market. The FCC authorized the licensing of "low-power" television stations on channels that could not be used for full-power stations. These stations are "secondary" to full-power stations: their applications must show that these stations are not predicted to cause any interference within the Grade B service area of an existing station.<sup>24/</sup> Moreover, once on the air, these stations cannot cause any actual interference to regular reception of an existing or new full-service station, even outside the full-service station's Grade B service area; if they do, they must adjust their height and power to eliminate the interference or go off the air. However, as discussed in greater detail in Part III, monitoring actual interference is notoriously difficult. Viewers have difficulty identifying the source of the interference and often fail to complain. It is likely, therefore, that a great deal of unpredicted interference from low-power stations and other operations goes unreported and uncorrected.

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<sup>24/</sup> 47 C.F.R. § 76.803(b).

C. Interference From Nontelevision Services.

There is a second category of interference that has considerably greater potential to degrade the quality of the public's television service. It is nontelevision-to-television interference -- from co-channel users, adjacent-channel users, and intermediate frequency-channel users.

1. Co-Channel Users.

The FCC has authorized the "shared" use of television broadcast channels by non-broadcast services. Some of this "sharing" is in fact a reallocation of broadcast channels to land mobile.<sup>25/</sup> Because these channels are within channels used for television, there exists the potential for interference, which is often realized in fact.

The FCC has also permitted certain non-broadcast radio services to operate on broadcast channels at very low power levels subject to restrictions that theoretically prevent interference to the public's television reception. In recent years, the Commission has authorized the use of broadcast channels for field sensor security systems,<sup>26/</sup>

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<sup>25/</sup> *Reallocation of Channels 14 Through 20*, 23 F.C.C.2d 325 (1970).

<sup>26/</sup> *Revision of Part 15*, 4 F.C.C. Rcd. 3493, 3493 ¶ 3 (1989).

wireless microphones,<sup>27/</sup> and electronic newsgathering.<sup>28/</sup>

In addition, many non-communications devices emit "spurious" radio signals that cause interference to other spectrum users, such as television stations. In recent years, the Commission has permitted equipment such as ultrasonic medical diagnostic machines<sup>29/</sup> and large and small computers<sup>30/</sup> to emit low-power spurious emissions on television broadcast frequencies.

Another very important source of co-channel interference to the public's television service is cable television. Cable uses both the VHF and UHF bands, and if cable signals "leak" out of cable connections or converters, they can interfere with off-the-air reception at nearby houses and apartments and on other receivers in the same dwelling.

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<sup>27/</sup> *Id.* See also Review of Subpart H, Part 74 of the Commission's Rules, Low Power Auxiliary Stations (First Report and Order), F.C.C. 86-582 (Dec. 29, 1986).

<sup>28/</sup> Amendment of Part 2 of the Commission's Rules Governing Frequency Allocations (Report and Order), 88 F.C.C.2d 812 (1981).

<sup>29/</sup> Amendment of Part 18 of the FCC Rules to Exempt Medical Ultrasonic Diagnostic and Monitoring Equipment from Technical Standards, 1 F.C.C. Rcd. 553 (1986).

<sup>30/</sup> Revision of Part 15, First Report and Order, Gen. Dkt. No. 87-389, 4 F.C.C. Rcd. 3493 (1989).