

## Federal Communications Commission

FCC 95-155

FOO MAIL SECTION

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 Federal Communications Commission  
 Washington, D.C. 20554

DISPATCHED BY

MM Docket No. 95-42

In the Matter of

Digital Data Transmission Within                      RM-7567  
 the Video Portion of Television  
 Broadcast Station Transmissions

## NOTICE OF PROPOSED RULE MAKING

Adopted: April 10, 1995;                      Released: May 2, 1995

By the Commission:

Comments Due: June 23, 1995

Reply Comments Due: July 10, 1995

1. We are initiating this proceeding to determine how best to permit certain digital technologies to be integrated with the current television broadcast service. Specifically, we seek comment on what procedural and substantive rules, if any, we should establish regarding the transmission of ancillary digital data within the active video portion of broadcast television NTSC signals.<sup>1</sup>

## BACKGROUND

2. Section 73.646 of the Commission's Rules allows the transmission, without prior Commission consent, of ancillary telecommunications services within the Vertical Blanking Interval (VBI) of television broadcast signals.<sup>2</sup> The VBI spans from Line 1 to Line 21, preceding the active video portion of the NTSC television signal. The Commission restricts ancillary signals to specific lines of the VBI, and, pursuant to Section 73.682(a)(23) of the Commission's Rules, ancillary signals must cause no observable degradation to any portion of the video or aural portions of the signals.

3. We have taken a different approach to ancillary transmissions within other portions of the television signal, such as the video portion. In this regard, we have generally not allowed the transmission of ancillary telecommunications services within the video portion of broadcast television signals without prior Commission consent.<sup>3</sup> The intent of

this policy is to ensure the public's ability to receive over-the-air video broadcast transmissions of the highest quality made possible by the NTSC standard.

4. Recently, two general approaches have been proposed to the Commission for the transmission of digital data within the video portion of the television signal, each intended to be imperceptible to viewers. Both have been permitted on a limited basis.

5. One of the two methods replaces the transmitted video signal with digitally encoded information in a part of the picture not normally seen by viewers. Line 22, the first line of active video, is used for this purpose. Depending on the particular encoding method, a video display of line 22 would look like either stationary and flickering, or moving black and white or colored dots or dashes. However, as these visible effects of data encoding are located at the very top of the TV picture, they are seldom seen because all TV sets to some extent "overscan" the picture to ensure that the portion of the picture tube that is visible is completely filled with the picture. Without the overscan, the picture would appear with a narrow black border. To date, the Commission has authorized only line 22 for such activity, although in theory, digital signals could be concealed in the left or right edges of the picture, or at the bottom. In 1985, by letters from the Chief of the Mass Media Bureau, the Commission authorized the use of line-22 systems developed by Telescan, Inc. and Ad Audit, Inc. for electronic verification of television broadcasts. These systems were designed to convey information about the date, time of day and length of commercial messages, as well as the presence of audio and video. Public comment on these systems, principally from broadcasters, generally did not oppose their authorization provided that: (1) broadcasters were advised of the presence of the signals in the source material provided to the stations and (2) the ultimate control and authority with respect to the signal transmission remained with individual television station licensees. The Commission made these terms a condition of the subsequent grants.

6. The other method of concealing digital signals distributes them throughout the visible picture. The amplitudes of such signals are kept sufficiently low (or they are confined to such a limited part of the normally emitted video spectrum bandwidth) that they are invisible to the viewer. Tests of such systems indicate that, with a proper selection of system parameters, no degradation to picture brightness, contrast, color or focus is perceptible to the viewer. One such system (the Special Data Transmission System or "SDTS") was proposed by the National Broadcasting Company (NBC). On March 3, 1992, the staff determined that the degradation caused to the television picture by NBC's SDTS was indiscernible, and that no further authorization was required for its use. (Letter to Jane E. Genster of March 3, 1992.) However, the data rate of the SDTS is only 240 bits per second, which is much less than is being

<sup>1</sup> NTSC is the acronym for the National Television Systems Committee, which developed the standards for the television broadcast system currently employed in the United States. An NTSC television picture consists of 525 lines, half transmitted during each of two interlaced fields. Each field contains 21 lines of vertical blanking interval, with the remainder of the lines containing picture information. See 47 C.F.R. §§ 73.681, 73.682.

<sup>2</sup> The VBI is the portion of the television broadcast signal that

occurs at the beginning of each field. In the VBI, synchronizing pulses are transmitted and the electronic beam is turned off while it retraces from the bottom to the top of the screen, where the beam then begins the vertical scan of the next television picture. No picture information is transmitted during the VBI.

<sup>3</sup> *Public Notice*, FCC 70-387 (April 20, 1970), 22 FCC 2d 779 (1970).

considered in this proceeding and therefore the performance of the SDTS may not be indicative of the performance of a system using a much higher data rate.

#### WavePhore Request

7. By letter dated December 9, 1993, WavePhore, Inc. (WavePhore) requested a declaratory ruling that television broadcast licensees may, without prior Commission authorization, use WavePhore's "TVT1" system to transmit digital data signals.<sup>4</sup> This system (which is similar to the type described in the preceding paragraph) transmits digital data on a subcarrier within the standard 6.0 MHz NTSC television signal, between 3.9 MHz and 4.2 MHz above the visual carrier frequency, at an amplitude close to the video noise floor. The request states that the "TVT1" system transmits data at a rate of 384 Kbps, and may soon be able to send data at a rate of 1.544 Mbps. WavePhore asserts that its system generates no out-of-band spectral components.

8. WavePhore asserts that its system causes no visual degradation of the television picture as viewed on any commercial television set, because: (1) all commercial television tuners filter out that part of the spectrum that contains the data; (2) the amplitude of the data transmission is only several IRE units above the video noise floor and is therefore almost impossible to discern; (3) the data is injected into a narrow 300 kHz band that adds no significant component to the video noise floor when integrated and weighted over a 4.0 MHz video bandwidth; and (4) the data subcarrier's exact frequency and phase result in a "picket fence" data spectrum that is interleaved with respect to the comb structure of the chroma and lumina spectrum.

#### Initial Comments on WavePhore Request

9. On January 25, 1994, the staff issued a Public Notice inviting interested parties to address the assumptions, experimental data, and conclusions set forth in WavePhore's request.<sup>5</sup> Commenters were also asked to address whether any combination of intrachannel data transmission systems might cause undue interference to television broadcast signals.

10. Three parties submitted comments in response to the Public Notice. The Association for Maximum Service Television, Inc. (MSTV), the Consumer Electronics Group of the Electronic Industries Association (Electronics Group), and Radio Telecom & Technology, Inc. (RTT) all support the use of excess capacity within the video portion of the television broadcast signal to provide digital data services. However, they urge the Commission to exercise caution in determining how best to promote digital data transmission in conjunction with NTSC television signals. The commenters seek both to minimize interference with the video and audio portions of the signal and to encourage further innovation in digital data technology.

11. RTT supports WavePhore's specific request. It also requests the Commission to allow any party to superimpose signals on an existing television transmission without prior Commission authorization, as long as the signals do not

degrade television broadcast reception in any discernible way. This absence of regulatory burden, RTT contends, would allow broadcasters and those associated with data transmission to compete most efficiently in the expanding "information superhighway." Further, RTT notes that WavePhore's proposal would use an encoder that performs two functions: (1) a slight low pass filtering and delay equalization of the video signal; and (2) linear addition of the data to the video. RTT asks whether, in the data insertion process, it would be permissible to filter out some of the video signal in order to insert the desired new data signal.

12. More specifically, citing Section 73.699, Figure 5, of the Commission's Rules, RTT notes that the bandpass characteristic of the standard transmitted video signal begins to roll off at frequencies above 4.2 MHz, reaching a negligible value just below the sound carrier centered at 4.5 MHz above the visual carrier frequency. Figure 11 of the Rule, RTT adds, indicates that the ideal receiver detector output rolls off at frequencies above 4.2 MHz. RTT states that WavePhore proposes to begin to roll off the video 0.3 MHz lower, at approximately 3.9 MHz, where its signal begins. According to RTT, this roll off could not only adversely affect the monochrome fidelity, but could also make the chroma subcarrier sidebands become even more asymmetric. Therefore, RTT asks whether a broadcaster may reshape the output of its transmitted video signal so as to delete any video that might otherwise interfere with the proposed new inserted data.

13. The other two commenters urge the Commission to exercise caution in determining the appropriate regulatory framework of the newly emerging digital data transmission industry. MSTV notes that other systems are being developed to transmit digital data, within both the video portion and other portions of the television broadcast signal. However, MSTV asserts that without a specific model as an industry standard for digital transmission within NTSC signals in general, the differing technologies that would be utilized could result in inter-system incompatibility, harming both consumers and the data transmitting industry. Thus, MSTV opines that adoption of a single industry standard would best facilitate the further development of a compatible digital data broadcasting system that would not harm the picture observable by viewers. MSTV adds that such action would be analogous to the Commission's recent determination that the development of another technical innovation, ghost-cancelling in television receivers, would be most efficiently facilitated by the adoption of a single industry technical standard.<sup>6</sup>

14. In addition, MSTV and the Electronics Group allude to the National Data Broadcasting Committee (the Committee), an entity formed in 1993 by the National Association of Broadcasters (NAB) and the Electronics Group. The Committee seeks to hasten the development of a voluntary national technical standard for high-speed data broadcasting using NTSC television signals as a delivery medium. MSTV and the Electronics Group assert that the Commission should rely on the Committee's findings and recommendations in setting an industry standard. Moreover, MSTV notes that the Commission has previously

<sup>4</sup> WavePhore's petition is hereby incorporated into this proceeding. A copy of it and the associated comments have been placed in the docket file.

<sup>5</sup> Public Notice, DA 94-67 (January 25, 1994).

<sup>6</sup> Report and Order in MM Docket No. 92-305 (*Permissible Uses of the Vertical Blanking Interval of Broadcast Television Signals*) 8 FCC Rcd 3613 (1993).

relied on the public sector to facilitate highly technical improvements in the television broadcast service. Specifically, it analogizes the work of this industry Committee to that of the FCC's Advisory Committee on Advanced Television Service, which has played an ongoing and critical role in the development of Advanced Television (ATV) technology.

15. The Electronics Group also requests the Commission to rely on the findings of the Committee and not enact any rule that would give one company an unfair competitive advantage in the introduction of broadcast data services. Specifically, the Electronics Group asserts that if WavePhore's request is granted, companies wishing to rapidly commence data transmission could use only WavePhore's technology, as it would be the only model not requiring prior Commission approval. At the same time, the commenter opposes the expansive rule proposed by RTT, which would allow any digital data transmission without prior Commission authorization, so long as there is no discernible effect on NTSC reception on the same or adjacent channels. Without the need for prior Commission authorization, the Electronic Group asks, who would determine whether there was "discernible" interference, and how would "discernible" be defined? Moreover, the Electronics Group expresses concern that such a rule would promote a race to create and utilize what would become a variety of incompatible systems. Such a reaction, the commenter warns, could ultimately deter investments by broadcasters, potential customers of the data services, equipment manufacturers, and consumers.

#### Nielsen Temporary Authority

16. On November 22, 1989, the staff granted A. C. Nielsen Company ("Nielsen") temporary, conditional authority to use line 22 of the active portion of the television video signal to transmit the Nielsen Automated Measurement of Lineup ("AMOL") system signal identification codes.<sup>7</sup> On March 15, 1990, Nielsen requested permanent authorization, after a period in which the compatibility of its AMOL system was tested with a functionally similar but technically different system employed by Airtrax. Several parties, including Airtrax, opposed Nielsen's request and successive pleadings were filed. By a letter dated May 1, 1990, the temporary authority was extended until the Commission acts on the request for permanent authority, or until the temporary authority is expressly withdrawn.<sup>8</sup> The Commission in this proceeding will determine whether Nielsen's request for permanent authority should be granted.

#### Airtrax Petition

17. As a result of the difficulties encountered in obtaining assurance that its commercial identification system would not be overwritten (and thus be rendered useless) by Nielsen's AMOL system, Airtrax filed a petition for rule making (RM-7567) on April 9, 1990, which requested the Commission to set standards for "special signal" use of line 22.<sup>9</sup> As justification for the rule making, Airtrax noted that even with the limited number of special signals currently

authorized, disputes had arisen as to how to ensure compatibility of existing systems and to ensure that one entity's system would not preclude other users from access to line 22 at individual TV broadcast stations. It argued that the Commission had a statutory duty to promote the provision of new technologies and service to the public and that it should establish the ground rules by which competition may take place. Airtrax submitted that a rulemaking proceeding was necessary to achieve the following goals: maintain licensee discretion to broadcast special signals; ensure that the use of line 22 is broadcast-related; ensure that the special signal does not degrade the broadcast signal; prohibit users of line 22 from "overwriting" other users without permission from the TV station and the other users of line 22; and, develop technical standards for an "open" system which allows for alternative and multiple uses of line 22. Such action, Airtrax argued, would further the public interest by promoting the development of future technology and by encouraging efficient use of the broadcast spectrum.

#### Initial Comments on Airtrax Petition

18. NAB, commenting on the Airtrax petition, argued that use of line 22 should be limited since it falls within the active video area. It noted that trends in display technology and receiver design practice indicate that line 22 may become increasingly more viewable by consumers as time goes on, due to increasing use of underscanned displays to accommodate both computer-generated images and broadcast television signals. NAB concurred with Airtrax that more efficient use of the line 22 resource is a desirable goal. It suggested that data services be designed to be more resource-efficient by using a minimum amount of line time, partitioning line 22 into several "time slots" and inserting each line 22 signal the minimum number of times needed for its particular purpose. It also suggested shifting line 22 data to a line within the vertical blanking interval immediately prior to broadcast transmission. NAB did not take a position about whether a line 22 resource-maximizing effort should be pursued as an industry-only effort, or whether the Commission should take a mediating or regulatory role. Finally, NAB requested the Commission to protect other lines in the active video area from future requests for non-video uses.

19. MSTV opposed ancillary use of active video lines and particularly opposed administrative rules to permit more widespread use of line 22. As an alternative, it favored more efficient use of the vertical blanking interval by broadcasters, advertisers and other ancillary-service providers. It disagreed with Airtrax that line 22 issues should be addressed in a rulemaking proceeding, although it agreed that the Commission's current *ad hoc* process for line 22 authorization was not an effective means of providing due process to all interested parties. In lieu of acting favorably upon the Airtrax petition, MSTV encouraged the Commission to consider the merits of adopting new rules to protect the active video lines from ancillary uses.

<sup>7</sup> Letter to Grier C. Raclin dated November 22, 1989. Nielsen's initial request for temporary authorization and subsequent request for permanent authorization of its AMOL system are hereby incorporated into this proceeding. Copies have been placed in the docket file.

<sup>8</sup> Letter to Grier C. Raclin dated May 1, 1990.

<sup>9</sup> *Public Notice*, Report No. 1833, released January 14, 1991. Airtrax's petition is hereby incorporated into this proceeding. A copy of it and the associated comments have been placed in the docket file.

20. Nielsen filed an opposition to petition for rule making and motion to dismiss in response to the Airtrax petition. Nielsen argued that the actions Airtrax advocated were unnecessary and that if standards for compatibility among line 22 signals and coordination among line 22 users became necessary, the industry could develop them without the Commission's regulatory involvement. Nielsen suggested that the Airtrax objectives of maintaining licensee discretion to broadcast special signals and to ensure that the broadcast signal is not degraded are basic conditions of authority granted under the Commission's existing *ad hoc* approval approach and do not require a rule making. Nielsen further suggested that normal business practices will prevent the "overwriting" of line 22 signals that Airtrax feared. Nielsen also claimed that the lack of a technical standard would foster innovation and development.

#### Yes! Entertainment Corporation Proposal

21. By letter of November 8, 1993, Yes! Entertainment Corporation ("Yes!") requested the Commission to permit television broadcasters to transmit a pulsed amplitude (7.5 to 100 IRE) signal beginning 9.1 microseconds after the beginning of the horizontal sync pulse and ending 10.36 microseconds after the beginning of the horizontal sync pulse (for a total pulse width of 1.26 microseconds) from line 22 through line 257 on each field.<sup>10</sup> At a rate of one pulse per line, 236 pulses per field, this would yield a data rate of 14,160 pulses per second, which could be coded to carry audio information. By means of equipment at a viewer's television receiver, this signal would be detected, processed and retransmitted from a set-top box to an external "TV Teddy" toy bear (a stuffed animal with a built-in receiver and speaker) for the purpose of making it "talk." Yes! indicates that there would be no visible degradation of received video because the affected portion of each scanning line is in an "overscanned" area.

22. Lastly (with respect to newer digital data transmission technologies), on January 19, 1995, the staff authorized Station WWOR-TV in Secaucus, New Jersey, to conduct tests of a data transmission technology developed by Digideck, Inc. (Digideck) called "D-Channel."<sup>11</sup> This system, like that of WavePhore, operates in the active video part of the TV spectrum and is represented as being imperceptible to viewers. Specifically, it adds a constant carrier level, quadrature phase-shifted (QPSK) data signal to the vestigial sideband (VSB) region of the video signal. The data carrier is placed 1 MHz below the picture carrier at a level between -30 and -36 dB relative to the video carrier at peak of sync. Data throughput is said to be 525,000 hps. A potential drawback of this system is that it operates near the edge of the television channel spectrum and it is possible that at higher injection levels, a slight increase in interference (on the order of 1 dB) to the lower adjacent channel may result.

#### DISCUSSION

23. We agree with those commenters who argue that the Commission should proceed with caution in this area. Like ancillary transmissions within other portions of the NTSC signal, digital data transmission within the video portion of broadcast television station signals is a communications tool that could expand and enhance the use of existing spectrum. However, it is important to create a regulatory framework that protects the quality of the NTSC television picture.

24. In light of the above two goals, we believe that we do not yet have sufficient information upon which to act on the requests from Yes! and WavePhore. Both requests raise significant questions pertaining to potential use for other purposes and technical compatibility. We solicit additional information in order to ascertain the long-term impact our authorization of these or other potential systems (such as Digideck's) may have on broadcasters, the data transmitting industry, consumers, and others. We also solicit the information we need to reach a conclusion on the Airtrax proposal for regulation of the use of line 22.

#### Licensee responsibility

25. Currently, television licensees must exercise control over all ancillary communications within the VBI and retain the responsibility to reject any material they deem unsuitable.<sup>12</sup> This responsibility also has been a condition of our authorization of line 22 data transmission systems. We see no reason to depart from this policy for data transmission within the video portion of the TV signal. We note that digital data signals can be inserted into the television signal "upstream" from the licensee's transmitter (after the baseband video signal has been created but before it has been supplied to the broadcaster who will actually transmit it). We are concerned that licensees continue to have effective control over such transmissions, and seek comment as to the appropriate regulatory mechanisms to guarantee such control.

26. Generally, we propose that licensees be allowed to transmit acceptable data signals without prior Commission authority or notification but not be allowed to relinquish to the data or program supplier the right to delete the data. We expect a licensee to be notified of any upstream data insertion in programming supplied to it unless the presence of the data is readily detectable. We further propose that a licensee be required to maintain a copy at the station of any contract regarding ancillary data transmissions within the video, as we currently require for data transmissions in the VBI.<sup>13</sup>

27. With the possibility that other manufacturers will want to employ different schemes for their own products or services, a substantial demand for such "hidden video spectrum" could develop, potentially posing difficult system compatibility problems. Our "licensee is responsible" approach gives the broadcaster the flexibility to choose among clearly mutually-exclusive uses. However, we are concerned that newly-developed systems might be incompatible with systems already in use without that fact being obvious to the broadcaster. It is also possible that while a

<sup>10</sup> Yes! Entertainment Corporation's letter of request is hereby incorporated into this proceeding. A copy of it has been placed in the docket file.

<sup>11</sup> Letter to WWOR-TV, Inc. from Barbara A. Kreisman dated

January 19, 1995.

<sup>12</sup> 47 C.F.R. § 73.646(d).

<sup>13</sup> 47 C.F.R. § 73.3613(e).

single system's digital data insertions on a particular video signal would cause no discernible degradation to reception of the TV signal by itself, a combination of transmissions could have destructive cumulative effects. We seek comment on how to be certain that broadcasters and users are aware of such cumulative effects and also on how, if at all, such incompatibilities could harm consumers, broadcasters, or the data delivery industry. We also solicit comment on whether we should leave the resolution of questions concerning system compatibility and the impact of cumulative effects on the video signal to presumably informed broadcasters or prescribe compatibility standards and insertion limits by regulation.

#### **Overscan vs. sub-video**

28. There are two fundamentally different methods employed to prevent the inserted data from being discernable to viewers. In this proceeding, we will refer to them as "overscan" technology, where data is inserted at the top, bottom, right or left edge of the picture and "sub-video" technology, where data is inserted in a manner that could affect regularly viewable portions of the TV picture but would still not be detectable by the ordinary viewer. Line-22 uses and the Yes! proposal are examples of the "overscan" approach. WavePhore's and Digideck's systems use the "sub-video" approach. We seek comments to explore two aspects of these different approaches: discernable degradation and broadcasters' ability to delete the data.

#### **Discernable degradation**

29. Our current policy generally does not allow any use of the video portion of the TV signal for ancillary purposes if the picture or sound would be adversely affected in a manner that is discernable by viewers. We propose to continue to require that broadcasters not be allowed to use any digital data transmission system (or combination of such systems) that would perceptibly degrade the video signal.

30. We note, however, that over the last twenty-five years (as solid state technology replaced vacuum tube technology), the amount of "overscan" used in television receivers has decreased from about five percent to a significantly smaller value, perhaps to less than two percent. We ask for comment on whether further reductions in overscan might result in signals in "overscan" areas becoming discernible to viewers in the future. The visibility of "overscan" data also may increase as multi-function video display devices increase their penetration in homes.<sup>14</sup> We seek comment on whether "overscan" technologies are visible on standard TVs and VCR recordings when "picture-in-picture" modes of viewing are invoked or will be more visible in the future when a TV signal is displayed as a "window" on a computer terminal graphics display. If development of these methods of television video display suggests that continuing use of "overscan" data transmission technology could create problems as the previously hidden information becomes visible on the screen, we request comment on whether "overscan" technologies should be phased out in favor of more subtle, less intrusive methods of data transmission. We seek comment on this issue and on a timetable for phasing out use of such systems, should we conclude to do so.

31. The picture degradation that results from sub-video methods of data transmission appears to be much more difficult to define and to detect. We seek comment on whether there is some method by which such picture degradation or "distortion" can be objectively measured and on whether there is some limit which should not be exceeded. We are also concerned about the filtering issue raised by RTT and seek comments on the extent, if at all, we should permit alteration of the video signal or the video bandpass characteristics to permit the insertion of data. Any further information on the potential for Digideck's D-Channel system to cause adjacent channel interference also is requested. Finally, we ask whether some types of receivers (such as the computer monitors mentioned in the preceding paragraph) might be more prone to showing degradation caused by any method of sub-video data transmission.

#### **Broadcasters' ability to delete the data**

32. As mentioned above, licensees must maintain control over all aspects of their signal, including data transmissions within the video. This means they must retain the right to reject any material they deem unsuitable. We seek comment on whether an ability to reject the entire program should be considered to satisfy this obligation or if any acceptable data insertion method must allow the broadcaster the option of stripping out the data.

33. "Overscan" data signals are limited to specific places in the picture and are easily deleted by the licensee. While the actual original picture content is lost when the data is inserted, it can be replaced either by a solid line (which would reduce the size of the picture slightly by adding to the border) or by duplicating the adjacent picture elements (for example, sending line 23 content on line 22, as well), making any picture degradation very difficult to detect or observe. We seek comment on what would happen to the picture if the licensee deletes sub-video data, if the licensee replaces sub-video data, and if multiple occurrences of such deletions or replacements take place. We are concerned that individually insignificant degradations to the picture could become cumulative, noticeable, and objectionable.

#### **Standards**

34. We wish to encourage the use of television signals for ancillary data transmission and to permit new technological developments. We seek comment on whether special rules should be applied to digital data transmissions that are directed to the general public. In that situation, adopting a standard might be essential to incorporating the appropriate decoding circuitry into future television receivers. If digital data transmissions were intended to be directed only to specific subscribers with specialized equipment, there may be less need to adopt a standard, although some process would be needed to assess degradation of the program video or audio caused by the data transmission method.

35. While we are seeking comments now to expedite resolution of this proceeding and to gain information that can assist any interim decisions we may make, we intend also to consider the work of the National Data Broadcast-

<sup>14</sup> See NAB comments on the Airtrax petition at para. 18,

*supra*.

ing Committee when we adopt a final decision.<sup>15</sup> If the Committee submits a recommendation to the Commission after comments are due, we intend to provide notice of that recommendation and to solicit public comment on it. We have successfully relied on similar industry groups in the past. Specifically, we note the success of the National Television Systems Committee, an industry group established in 1940 to develop technical standards for television broadcasts. The standard proposed by the industry and adopted by the Commission has served the nation's needs for half a century. As it continues its work, we encourage the Committee to take into consideration the many issues raised in this *Notice*, so as to formulate the most flexible and potentially useful method or methods of data transmission possible.

36. We also seek comments on whether there are limitations that we should impose on a technical standard developed by industry. For example, should a portion of a sub-video data transmission system's capacity be reserved for current line 22-type uses (which have not been intended for use by the general public)? Should any additional portions of its capacity be reserved for communications that would be targeted toward specific users (such as the Yes! proposal for its "TV Teddy" toy)? We request comment on whether that kind of application requires a specifically dedicated portion of the data signal instead of extracting needed information from a more general digital data signal. In sum, we ask whether any system that may be recommended as a standard must be "partitioned by use" at the time of its possible adoption or whether its design permits its adaptation to potential future uses on a flexible or dynamic basis. This question should also be considered in relation to digital signal decoders that might be used by the general public, either as an optional accessory provided on certain models of televisions or as some kind of external converter.

37. We seek comment on how our rules should reflect the industry standards. The options range from our continuing to authorize such transmissions on an *ad hoc* basis to our adopting a comprehensive set of rules defining and regulating permissible transmissions. We request comment on adopting rules analogous to those that govern multichannel television sound.<sup>16</sup> There, an industry committee evaluated the technology and recommended a standard. Our rules refer to the standard, which is also published in a Bulletin issued by our Office of Engineering and Technology, but are only designed to protect receivers designed to the standard from signals to which they would respond incorrectly.

38. Pending the Committee's completion of its work, we seek comments on whether we should consider the near-term authorization of individual methods of such transmission on an *ad hoc* basis. We would expect technical conflicts between users to be resolved by the individual licensees, but request comments on whether Commission involvement or guidance is necessary to focus licensee

decisions on the public interest. Commenters are invited to address how we could resolve questions of picture or sound degradation.

#### Non-technical aspects

39. While the digital data transmission technology discussed above represents a significant increase over the current information-handling capacity provided by VBI technology, we propose that the policies currently contained in Sections 73.646 (which sets forth the rules currently applicable to non-broadcast services provided in the VBI) and 73.667 (TV subsidiary communications services) be extended to include non-broadcast use of overscan and sub-video data transmission technologies.

40. However, lines in the VBI are also used for broadcast and broadcast-related services. Line 21<sup>17</sup> is used for closed-captioning (text depiction of picture content) and for text mode data and extended data service information (the content of the latter is not regulated and may include any kind of information the broadcaster believes would serve the public interest). Line 17,<sup>18</sup> reserved for the use of the broadcast-related ghost-cancelling reference signal, is being used by many newer NTSC television receivers to improve picture quality. Accordingly, consistent with the inference made in paragraphs 34-36, *supra*, concerning transmissions directed to the general public, we propose to permit broadcast and broadcast-related use of sub-video data transmission technology and ask for comment on this proposal.

41. This *Notice* was formulated in response to the referenced pending petitions and is consistent with the Commission's general policy to foster more efficient use of spectrum and improve the diversity and quality of the telecommunications services available to the public. As a final matter, given the pendency of proposals to replace the current NTSC transmission standard,<sup>19</sup> we ask whether by further enhancing NTSC television in the manner described herein the Commission would provide a disincentive for the public to readily accept and upgrade to the digital service that we expect will be introduced in the near future. Similarly, we request comment on the extent to which enhancing NTSC service in the manner described herein could slow or create a disincentive to the recovery of the spectrum currently used by NTSC stations, as discussed in the advanced television proceeding.<sup>20</sup>

#### CONCLUSION

42. We seek comments on all of the issues raised in this *Notice* and any other related matters that commenting parties wish to bring to our attention. In particular, specific rule change proposals set forth and supported in initial comments would help to focus reply comments and therefore would expedite our consideration of these issues.

<sup>15</sup> See para. 14, *supra*.

<sup>16</sup> See 47 C.F.R. § 73.682(c)(3), the definition of BTSC in 47 C.F.R. § 73.681, and the *Second Report and Order* in Docket No. 21323, FCC 84-116, released April 23, 1984, 55 RR 2d 1642, 1984, 49 Fed. Reg. 18100, April 27, 1984.

<sup>17</sup> See 47 C.F.R. § 73.682(a)(22)(i).

<sup>18</sup> See 47 C.F.R. § 73.682(a)(21)(iv).

<sup>19</sup> See *Memorandum Opinion and Order/Third Report and Order/Third Further Notice of Proposed Rule Making* in MM Docket No. 87-268, 7 FCC Rcd 6924 (1992).

<sup>20</sup> See *Second Report and Order/Further Notice of Proposed Rule Making* in MM Docket No. 87-268, 7 FCC Rcd 3340 (1992) and *Second Further Notice of Proposed Rule Making* in MM Docket No. 87-268, 7 FCC Rcd 5376 (1992).

**PROCEDURAL MATTERS**

43. Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's Rules, 47 C.F.R. Sections 1.415 and 1.419, interested parties may file comments on or before **June 23, 1995**, and reply comments on or before **July 10, 1995**. To file formally in this proceeding, you must file an original and four copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus nine copies. You should send comments and reply comments to the Office of the Secretary, Federal Communications Commission, Washington, DC 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center, room 239, at the Federal Communications Commission, 1919 M Street, N.W., Washington, DC 20554.

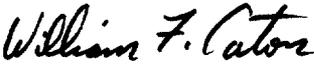
44. This is a non-restricted notice and comment rulemaking proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission Rules. See generally 47 C.F.R. Sections 1.1202, 1.1203, and 1.1206(a).

45. As required by Section 603 of the Regulatory Flexibility Act, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the expected impact on small entities of the proposals suggested in this document. The IRFA is set forth in the attached Appendix. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments on the rest of the Notice, but they must have a separate and distinct heading designating them as responses to the Initial Regulatory Flexibility Analysis. The Secretary shall send a copy of this Notice of Proposed Rule Making, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act, Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. Section 601 *et seq* (1981).

46. Authority for the proposed amendments is contained in Sections 4(i) and 303 of the Communications Act of 1934, as amended.

47. For further information, please contact Paul Gordon at (202) 776-1653 or James E. McNally, Jr. at (202) 418-2190.

FEDERAL COMMUNICATIONS COMMISSION

  
William F. Caton  
Acting Secretary

**APPENDIX****INITIAL REGULATORY FLEXIBILITY ACT STATEMENT****I. Reason for Action**

In recent years, a number of requests have been submitted to the Commission concerning systems for embedding digital data within television video signals. These proposals raise important questions about how embedded data sys-

tems could be accommodated, concerns over the extent to which broadcasters' control over their signals may be impaired or lost, and to what degree embedding multiple digital signals in the television picture may result in discernable picture degradation.

**II. Objectives of the Action**

The purpose of this proceeding is to develop policies and rules defining the respective rights and responsibilities of broadcast licensees and persons wishing to provide different types of digital information service, to explore the potential uses of such digital technology, to determine to what extent different systems may be compatible, to determine whether a national technical standard is necessary for the provision of such service, and to determine the probable impact of such service on the quality of primary television service.

**III. Legal Basis**

Authority for the actions proposed in this Notice may be found in Sections 4(i) and 303 of the Communications act of 1934, as amended, 47 U.S.C. 154 and 303.

**IV. Reporting, recordkeeping and other compliance requirements**

Policies adopted in this proceeding could lead to increased record-keeping requirements being imposed on broadcast licensees and/or providers of digital information service. If such requirements are imposed, they would probably take the form of such entities being required to maintain copies of contracts relating to the provision of such service and making them available to the Commission upon request.

**V. Federal rules which overlap, duplicate or conflict with these rules.**

None.

**VI. Description, potential impact and number of small entities involved.**

Approximately 10,000 licensees of television broadcast facilities of all types (Commercial and educational VHF and UHF stations, translators, boosters and Low Power TV stations) could be affected. The number of digital service providers affected would probably be much less.

**VII. Any significant alternatives minimizing the impact on small entities consistent with stated objectives.**

A decision to implement a national standard applicable to all digital information to be contained within the television picture, in conjunction with a decision as to the general types of information that could be provided, could greatly reduce or eliminate the compatibility problems related to the provision of digital data services and decrease the need for additional record-keeping requirements.