effects. The schedule for the system testing program will depend on how soon system proponents can make available equipment for evaluation.* Since the Commission has demonstrated its determination to move forward expeditiously in this proceeding, system proponents have an added incentive to develop testable equipment in the shortest possible time.

3. The OET Spectrum Report Is A Valuable First Step For Spectrum Allocation Decisions.

The Commission states that the FCC studies support several tentative decisions that will allow us to focus our efforts regarding the spectrum to be used for ATV."** As stated above, CBS agrees that it is indeed the time to begin "to focus our efforts," and agrees as well that the studies in question are a thoughtful, useful contribution to the research, analysis and testing that must underlie the all-important spectrum allocation decisions that the Commission must make. However, as the FCC staff acknowledges, the spectrum analysis work to

---

* CBS believes that systems presented for evaluation should include both audio and video components. Obviously, both are integral parts of any complete television system and will have to coexist within ATV spectrum allotments. Since the Commission will be adopting standards for complete ATV systems, any testing of audio or video proposals alone will need to be repeated if and when the missing element is later supplied.

** Further Notice, ¶74.

date is limited to "indications of what can be achieved by certain broadly outlined assignment strategies."* CBS believes that the staff studies should be considered only as a first step in the analysis of whether to limit supplemental spectrum allotments to the VHF/UHF bands.

The OET investigated the availability of additional spectrum for ATV in the VHF/UHF frequency bands.** To reduce the problem to a manageable level, certain simplifying assumptions were made. Of necessity, a heuristic rather than an exact approach was taken because the number of approaches to making allocations is very large. Also, due to time limitations in preparing the report, only a small number of computer runs was possible.

The OET Spectrum Report estimates that 100% of U.S. television stations would be able to provide ATV service with supplementary VHF/UHF spectrum, but only if an ATV transmission

---

* Interim Report: Estimate of Availability of Spectrum for Advanced Television (ATV) in the Existing Terrestrial Broadcast Bands, FCC/OET TM 88-1, ("OET Spectrum Report"), p. 6.

** The Advisory Committee's Planning Subcommittee Working Party on Spectrum Analysis prepared a similar study. Both used the FCC and NTIA data bases. Although there were some differences in the computer programming and in the presentation of the data in the studies, the procedures followed, the assumptions made, and the results are very similar.

system is chosen that (1) can "operate at reduced minimum separation distances;" (2) has "substantially better interference rejection characteristics than existing NTSC systems;" and (3) can operate with no more than a 3 MHz, not necessarily contiguous, augmentation signal.*

While these preliminary data do offer the hope of 100% participation by existing licensees, it must be emphasized that this possibility depends on the above assumptions, which the Commission itself recognizes are aggressive. For example, the OET's first assumption is that 100-mile co-channel separations (rather than the present 190 miles) would be feasible. In that regard, the Commission states that the greatly reduced D/U margin that 100-mile separations would entail "may be very difficult for ATV technologies to achieve, and shortcomings would result in reduced service areas or fewer than all

---

* OET Spectrum Report, p. 14, and Table 1, p. 2. According to the OET study, 96% of stations could be supplied with 6 MHz of noncontiguous VHF/UHF spectrum under the same set of assumptions. The equivalent table in the Notice says 98% (Table 1, p. 32). The shortfall would occur in the major markets. The major markets will suffer further if any of these assumptions proves unwarranted. For example, if UHF augmentation of a VHF signal proves to be unworkable, so that each VHF station would need a VHF augmentation allocation and each UHF station would need a UHF augmentation allocation, 84% of the stations nationwide could get assignments, but only 67% of the stations in major markets.

stations being authorized to broadcast ATV service."*

The second assumption of the OET study (which can only be confirmed by system testing) is that assignment "taboos" can be disregarded. Yet, the Commission notes that "the degree to which the UHF taboos may be relaxed to accommodate ATV transmissions while NTSC is being used is unclear."**

Further, the OET's companion report on UHF receiver interference cites several "cautions" with regard to its conclusion that "[m]ost of the taboo channels look favorable for potential use as ATV augmentation channels."*** They include: the limited sample used in the study; lack of information on the current generation of receivers; the

---

* Further Notice, ¶63.

** Id., ¶65.

*** Analysis of UHF TV Receiver Interference Immunities Considering Advanced Television, FCC/OET TM 88-2 ("UHF Study") at 1. As noted supra, ATV receivers will presumably be designed to eliminate the need for "taboos." Therefore, interference into the ATV receivers was not considered. However, NTSC receivers now on the market are not optimally designed for a taboo-free environment. Since any ATV scenario using UHF spectrum assumes elimination of UHF taboos, CBS believes that receiver manufacturers should be encouraged to begin to manufacture NTSC sets using known, inexpensive technology which will improve dramatically the present taboo interference rejection characteristics of television receivers. The sooner this process begins, the shorter will be the transition period to ATV.

expectation that the taboo elimination posited could result in a loss of usable service to up to 10% of households; and the unstudied possibility that "on some receivers the effects of some interference phenomena may change precipitously from just acceptable to a much worse condition." The OET states that it plans "to undertake additional receiver tests and analysis programs that will improve [its] statistical inferences."*

As for the third assumption of the OET Spectrum Study -- that 3 MHz of augmentation spectrum not necessarily contiguous to the NTSC channel will be sufficient -- none of the proposed ATV systems that are designed to use no more than 3 MHz of spectrum to carry ATV augmentation signals have been tested, so their technical feasibility and performance levels are yet to be determined. Neither, of course, has it been determined whether non-contiguous VHF/UHF spectrum can practically be used to carry ATV augmentation information, and, even if it can, whether an ATV signal can be provided to a station's entire service area using such spectrum. The Commission should adopt final spectrum allocation decisions only when the planned studies can be completed and the validity of these assumptions can be determined.

---

* UHF Study, p. 14. The OET should continue its programs and include some of the latest innovations in receiver design and NTSC enhancement such as Improved Definition Television (IDTV) receivers and comb-filtered signal sources. It is possible that IDTV receivers with multi-dimensional filters may be more, rather than less, susceptible to interference, and that some enhanced NTSC systems will be more susceptible to interference because of the additional information being transmitted.

As CBS stated in its initial Comments in this proceeding, one of the Commission's goals in its spectrum allocations decision-making should be "to allow the present potential audience of every broadcast station to make the transition to viewing the programming of that station in an HDTV format."* CBS believes that the Commission should reaffirm that guiding principle, so that system proponents will focus on overcoming the difficulties that may be expected to be encountered in implementing their systems in areas of intense spectrum use and dense populations. This is especially important insofar as the current OET data indicate that audiences in the major cities would be the losers in the event of the inadequacy of VHF/UHF spectrum to meet the ATV needs of 100% of the stations.**

These studies of spectrum availability for ATV have provided much useful preliminary information. It is vital to the success of ATV that this spectrum analysis work continue to have a high priority. Future studies should look at the impact of co-location of all transmission sites for the coverage of

---

* Comments of CBS Inc., MM Docket No. 87-268 (November 18, 1987) ("CBS Initial Comments"), p. 28.

** The OET staff indicates that it has not yet "explored conditions under which all stations of major cities could be accommodated, or the extent to which both nationwide and major city requirements could be met simultaneously." OET Spectrum Study, p. 2. Such refinements of the study should be a high priority.

the same geographic area, priority allocation to high population areas with the objective of maximizing the number of potential ATV channels that viewers could receive, and the effect of precision offset of carrier frequencies. The data base should be revised to include new data from the propagation studies being conducted by the ATSC and the ATTC and from data resulting from the testing of proposed ATV systems.

4. Further Study Of 1-13 GHz As A Source Of Spectrum For ATV Terrestrial Broadcasting Should Not Be Foreclosed At This Time.

During the coming months, the Commission staff should proceed with its plan to refine its spectrum availability data while relevant information about the interference characteristics of proponent systems becomes available from the testing process. At the same time, the ATTC should be encouraged to proceed with propagation tests of the 2.5 and 12 GHz bands. The ATTC Board of Directors has recently approved a propagation test program, and the current schedule calls for completion of these tests in the next six to eight months.*

* The ATTC has received authorization from the Commission to use UHF channels 58 and 59 in the Washington area for ATV terrestrial broadcast propagation tests. Broadcasting, October 24, 1988 at 89. Applications for experimental authority for the ATTC to conduct propagation tests in the Washington, D.C. area using the 12 GHz and 2.5 GHz bands were filed on September 16, 1988, and October 6, 1988, respectively. FCC Public Notice, Report No. 14300, released October 14, 1988.

The Commission should not foreclose use of these frequencies for terrestrial ATV broadcast transmission unless and until it has been determined that they are unsuitable or that VHF/UHF spectrum is in fact sufficient to provide every television station with sufficient additional spectrum for a competitive ATV system.

The Commission notes in the Further Notice that "transmitting augmentation signals on so widely separated frequencies as VHF and 12 GHz does not appear to be technically or economically feasible."* To CBS's knowledge, 12 GHz has not been seriously proposed as the source of augmentation channels. However, as discussed further infra, the possibility of using 1-13 GHz in a simulcasting scenario should not be rejected at this time.** Further, even if 1-13 GHz is ultimately not needed for primary ATV broadcast transmissions, it is possible that new spectrum will be needed for broadcast translator stations and for broadcast support services.

---

* Further Notice, ¶80.

** Further Notice, ¶89. 12.2-12.7 GHz is, of course, already allocated internationally to terrestrial broadcasting on a shared basis with the Broadcasting Satellite Service. Final Acts of the World Administrative Radio Conference, International Telecommunications Union, Geneva, Switzerland, July 1979. In 1982 the Commission waived that shared allocation in favor of a domestic direct broadcast satellite service ("DBS"). Report and Order, GEN. Docket No. 80-603, 90 FCC 2d 676 (1982). No direct-to-home service in the 12 GHz band has yet been implemented, so that no service disruption would occur if at least a portion of that band were to be reserved for terrestrial broadcasting.

As the Commission notes in ¶¶97ff. of the Further Notice, broadcast support services using STLs, TV pickup links and the Fixed-Satellite Service now operate in the 1-13 GHz bands. The extent to which implementation of ATV broadcast service will require additional spectrum for these purposes in the 1-13 GHz bands or elsewhere is not yet clear. Specialist Group 3 of Working Party 3 of the Advisory Committee's Planning Sub-committee is in the process of examining the spectrum requirements of relay services that will be needed to support terrestrial broadcast ATV, and is also examining non-spectrum alternatives that may also be practical and available. Its report is expected in the spring of 1989 and should be useful to the Commission in reaching decisions on this aspect of ATV implementation.

CBS does not here assert that 1-13 GHz spectrum has been proven to be technically suitable for terrestrial ATV transmissions, although there is some preliminary evidence to that effect.* However, the opposite conclusion -- that propagation characteristics in these bands are inappropriate for terrestrial broadcast -- is just as speculative. Neither

---

* CBS/Westinghouse 12 GHz propagation tests were conducted in San Francisco in 1982, using the facilities of KPIX-TV. Even with a low power (10-watt) transmitter using frequency modulation, acceptable reception was possible at 70% of the test sites, both at the random locations throughout the metropolitan San Francisco area, and for the statistical grid within that portion of the city illuminated by the transmitting antenna. CBS Submission of Test Results of its Experimental 12 GHz Terrestrial Broadcast Operation, GEN. Docket Nos. 80-398, 80-603, 80-739, August 16, 1982.

conclusion is appropriate until the Commission has more information.

In this regard, Working Party 2 of the Planning Subcommittee recommended that "[p]ropagation in the 2 and 12 GHz bands should...be investigated" and that "[t]ests of proponent systems should be conducted" in those bands.* The Commission should encourage these tests to go forward, and the policy arguments of competing claimants for that spectrum should be considered only after the suitability of that spectrum for ATV terrestrial broadcasting has been tested and assessed.

B. "Minor Rearrangement" Of Channel Assignments In Major Markets To Maximize Available ATV Spectrum Should Not Be Considered At This Time.

The Commission seeks comments on the desirability of "limited channel reassignments for a small number of stations if that would allow [the Commission] to provide ATV spectrum to more stations than otherwise possible." The intent would be "not to significantly change the coverage area of the affected stations" and generally to "chang[e] a station's frequency by the least possible amount."** The OET characterizes this proposal as "a limited amount of repacking...by minor adjustments of channel allotments."*** CBS believes that, for

---

* Interim Report, p. 15.

** Further Notice, ¶92.

*** OET Spectrum Report at 3.

the time being, the Commission's focus should remain on the design and implementation of a terrestrial broadcast ATV system that will provide every existing television station ATV capability over its entire service area, without disrupting NTSC service to the current audience.

The Commission states "that maintaining existing service is extremely important, and that the public interest would be served by avoiding any substantial dislocation of existing television broadcast service."* CBS suggests that repacking, even on a limited scale, may cause major disruptions both for the affected stations and for their viewing audiences. Even limited repacking should not be considered unless and until all alternative means of avoiding such service disruption are exhausted.

The Commission notes that OET plans additional research "to determine if relatively minor changes would accommodate stations that otherwise might be unable to obtain additional spectrum" as a part of its overall continuation of research into spectrum availability under varying sets of assumptions.** CBS believes that it would be desirable as well for appropriate working parties of the Advisory Committee to study these questions, so that ultimate allocations decisions can be based on complete information and analysis. However, unless and

---

* Further Notice, ¶125.

** Id., ¶93.

until it becomes clear that each local over-the-air broadcast station will not be able, for technical reasons, to remain on its present channel and share equally in new spectrum allocated for terrestrial ATV broadcasting, the Commission should not consider implementation of channel reassignments or other "adjustments" to present service.

C. Border Areas

The Further Notice correctly notes that the implementation of terrestrial ATV in the border areas of the United States may require reconsideration of the bilateral agreements with Canada and Mexico.* What goes into that reconsideration will depend on the final ATV scenario adopted by the Commission.

As the Commisssion notes, both Canada and Mexico are interested in this proceeding and in advanced television systems. Indeed, Canada has formed its own Canadian Advanced Broadcast Systems Committee which has been instructed to establish contact with American testing organizations such as the ATTC. The Canadian Research Center, an advisory arm of the Canadian Communications Department, has suggested the joint approval by Canada and the U.S. of an ATV transmission method; and Canada has made

* Allocation of Television Channels between the United States and Mexico, Pike & Fischer, Current Service *, at 41:121; Agreement between Mexico and the United States Concerning UHF Television Channel Assignments, Pike & Fischer, Current Service *, at 41:135.

available to the ATS Committee a Canadian test facility for testing proposed transmission systems.*

It is not possible yet to comment specifically on the interference potential of proposed ATV systems and the obligations of the United States under the bilateral agreements. Such comment could be more specific and helpful after the propagation tests are conducted and after the proponents systems are tested. However, if additional spectrum is required for the approved ATV system, significant revision of the agreements would be required. Also, to the extent that a proposed ATV signal will change the elements of the NTSC television signal now permitted by the bilateral agreements to be broadcast within the specified distances from the borders of Canada and Mexico, those changes will need to be the subject of new bilateral agreements --at least to the extent those changes may cause interference to Canadian and Mexican broadcasting.

III. ATV STANDARDS ISSUES

A. The NTSC Standard Should Not Be Relaxed.

CBS agrees with the Commission that "little would be gained by eliminating or relaxing the NTSC standard at this time."** At

---

* Broadcasting, October 24, 1988, at 64.

** Further Notice, ¶109.

this crucial stage, the Commission and the Advisory Committee must continue to take an active role in guiding the development of terrestrial broadcast ATV, which will involve interrelated spectrum allocation, testing, and standards development activity. It is important that these activities be closely coordinated, so that spectrum research can inform the testing process, and vice versa, and ultimate ATV standards determinations can be reached at the earliest possible time. The relaxing of the NTSC standard at this still preliminary stage would serve no purpose and would complicate the mission of the Commission to provide for an orderly transition from the current NTSC system to a competitive ATV system that will serve the needs of the free over-the-air television audience for many years to come.

In that regard, CBS questions the need for, or the desirability of, a mechanism for granting waivers of the NTSC standard "for the purpose of broadcasting ATV signals" or "to improve the existing NTSC system."* The Commission already has familiar mechanisms, such as special temporary authority and experimental authorizations, that should suffice during the system development process.

---

* Further Notice, ¶109, fn. 128.

Waivers for ATV transmissions outside of this system development process would be counterproductive since they would complicate the task of reaching a consensus on a single ATV terrestrial broadcast transmission standard and implementing universal ATV service at the earliest practicable time. Further, to allow for improvements by waiver in the current NTSC standard at this time would certainly complicate the problems of designers of receiver-compatible ATV systems, which are difficult enough with a common base of NTSC transmission criteria.

B. The Commission Should Take An Active Role In The Setting Of A Terrestrial Broadcast ATV Standard.

CBS agrees with the Commission that "the public interest compels a Commission role in the development of standards with the advice and involvement of all sectors of the industry."* Indeed, the Commission cannot avoid playing such a role, because, unlike other standards-setting situations where new spectrum allocations are not involved, allocation decisions that must be made by the Commission in this instance will have a great impact on the ability of existing licensees to implement terrestrial ATV broadcasting. While CBS has all along urged that action in this proceeding must be expeditious

* Id., ¶113.

but not premature, it is worth repeating that a standards decision should not be made before the characteristics of proposed transmission systems have become known through testing, and before the suitability and availability of supplementary spectrum has been thoroughly explored. Otherwise, the risk is unacceptably high that the result will be either inadequate technical broadcast quality or the inability of some stations to participate in this next generation of broadcast service.

1. The Commission Should Choose A Single Transmission Standard.

CBS believes that a single standard for terrestrial broadcast ATV transmission should be established, so that each viewer can have access to all broadcast signals through a single, low-cost television set.

In general, judicious involvement of government in technical standard-setting can encourage investment by affected industries in the technology, lessen the risk of premature obsolescence, lower the costs of manufacturing due to economies of scale and, in turn, lower costs to the consumer. With particular regard to terrestrial ATV broadcast implementation, there are compelling reasons for a single standard to be chosen.

First, there are time constraints on ATV implementation that do not allow for the luxury of permitting the marketplace to sort out competing broadcast transmission standards. For example, nonbroadcast distribution of HDTV programming can be instituted in this country without the spectrum constraints faced by terrestrial broadcasting. As noted in CBS's initial Comments in this proceeding, HDTV production equipment is already in use, a vast archive of HDTV programming already exists in the form of 35mm film, and HDTV VCRs, videodisk players and monitors may be expected to be sold in this country in the near future.* While CBS believes that there is time for reasoned standards-setting based on sufficient information from systems testing, it is important that terrestrial ATV broadcasting not be unnecessarily delayed through failure to choose a single standard at the appropriate time.

Further, certain bedrock criteria must be met by a terrestrial ATV broadcasting system to protect the present and future viability of free over-the-air broadcasting, and this can best be accomplished in the standard-setting process. Examples include: ensuring the continuation of existing NTSC service during the transition period; the need for a competitive

* CBS Initial Comments, pp. 7-12.

quality system*; and the need to design sufficient technical headroom into an ATV transmission system to allow future improvements in technical quality to maintain competitiveness with nonbroadcast media. Long- and short-term spectrum efficiency must also, of course, be an important consideration.

In addition, the sheer enormity of the initial investment required for equipment manufacturers, broadcasters, program suppliers, and, of course, the public, to make the transition to ATV broadcasting justifies the Commission engaging in standard-setting in this instance. Affected parties are always naturally reluctant to invest in new technology that "might become obsolete if a different system is introduced in the market,"** and the size of that initial investment in this instance would understandably increase that reluctance.

Finally, unlike television stereo, for example, it is not just the timing of the introduction of a service enhancement that is at stake, but rather the ability of free television to meet direct competition from nonbroadcast providers of HDTV programming. Under all these circumstances, there is ample justification for a single standard to be settled upon, and for the Commission to set the stage for terrestrial ATV

---

* The choice of a competitive quality standard at the outset would be preferable to reaching that quality level through interim or multiple steps. Multiple steps would, of course, be more costly to consumers and to broadcasters.

** Further Notice, ¶113.

broadcasting by playing a central role in the standards-setting process.

2. The Commission Should Ratify Any Standard Reached By Consensus Of The Affected Industries But, If Necessary, Should Act On Its Own.

CBS noted at the outset that the Commission's initial NOI in this proceeding and its establishment of the Advisory Committee have served to marshal experts from all the affected industries and to generate a large amount of productive activity from working parties and from industry organizations such as the ATSC and the ATTC. This activity will certainly continue and intensify over the coming months, and, along with work undertaken by the Commission staff, will soon result in data that will provide a basis for consideration of standards decisions. It is at this point too soon to predict whether an industry consensus can be reached on an ATV broadcast transmission system.

However, if such a consensus does develop, CBS believes that the Commission should affirmatively sanction the agreed-upon standard.* That is, the Commission should resist the

* The Commission notes that, as with television stereo, key features of an industry-approved standard could be protected as an alternative to its adoption of the standard in toto, in order to allow for "improved or different systems without the need for regulatory action to approve changes in the standard." Further Notice, ¶116. CBS believes that such an alternative should not be dismissed out of hand, but should be approached with special caution because of the compelling public interest in instituting terrestrial ATV broadcast service at the earliest practicable time. A strong expression of Commission approval of a single standard will be important to reaching that goal.

temptation to let purely voluntary action take its course because, for the reasons stated above, the stakes are too high, and the risk is unacceptable that voluntary action would not provide the necessary impetus to prompt implementation of broadcast ATV service. The argument that Commission action at that point might result in an undesirable lack of flexibility is not sufficient. First, the Commission's imprimatur on an ATV transmission standard would be of great symbolic importance to the industry and would encourage investment. Further, technical headroom can and should be built into the standard so that improvements can be implemented as they are developed. Finally, Commission action could include a commitment to revisit the standard after a reasonable period (e.g., 10 years) to determine whether retention of a Commission-approved standard is necessary.

If there is ultimately no consensus among the affected industries on a single ATV terrestrial broadcast transmission standard, the Commission should not be reluctant to make a choice. The precise time when such action would be appropriate cannot yet be determined, but the answer to whether industry consensus is likely to form will suggest itself as planned system testing narrows the field of candidate systems and as propagation testing and further spectrum research clarify the Commission's allocations options.

3. "Open Architecture" Receivers Are Not A Practical Alternative To The Adoption Of A Terrestrial ATV Broadcast Transmission Standard.

The concept of "open architecture" receivers ("OARs") has surface appeal because it implies that a single ATV broadcast transmission standard is unnecessary and that compatibility of future technological advances with such receivers can be built in. Upon closer consideration, however, that concept is flawed.

From the manufacturers' point of view, OARs cannot substitute for standards, because of the difficulty of attempting at the outset to anticipate the varied ATV transmission standards that should be accommodated by the receiver. Even if the right group of multiple standards could be determined, the extra cost and complexity of such receivers would slow their market penetration and thus adversely affect the introduction and affordability of terrestrial broadcast ATV service.

In any case, it is unreasonable to expect that manufacturers could anticipate significant future ATV developments with sufficient prescience to justify reliance on OARs instead of a single standard. In that regard, OAR advocates cite the home computer as a successful example of an "open architecture" device which can easily accommodate new developments as they

are introduced. While incremental improvements in capability may be accommodated in this fashion by the typical home computer, it is not so simple to accommodate more significant technical improvements (for example, a more powerful language or interface bus), and consumers typically replace home computers when significant upgrading is desired.

In sum, CBS believes that the cost, complexity and inflexibility of OARs make them an inadequate substitute for a single terrestrial ATV broadcast standard.

4. Existing NTSC Service Should Continue During The Transition To Terrestrial Broadcast HDTV.

CBS agrees with the Further Notice that, during a transition to a terrestrial ATV broadcast system, "maintaining existing service is extremely important, and ... the public would be served by avoiding any substantial dislocation of existing television broadcast service."* It deserves reemphasis, however, that this result can be obtained either by adoption of an ATV/NTSC multiplexed/augmented ATV transmission standard**, or by a simulcast scenario.

---

* Further Notice, ¶125.

** In order to be fully compatible with current NTSC transmissions, an NTSC-based ATV system would have to accommodate the current three audio channels, one data channel, and the vertical blanking interval lines now used for a variety of broadcast-related and other purposes.

Because of this justified concern for the ability of the free over-the-air television audience to have uninterrupted access to current NTSC service, CBS believes that there has been an overemphasis on the "compatibility" of proposed ATV systems with conventional receivers. In fact, the simulcasting option -- which would serve exactly the same function as receiver-compatibility -- has certain conceptual advantages.

First, in general, an ATV system that is not saddled with the NTSC imperfections may be expected to produce a higher quality picture in a given amount of spectrum. Further, simulcasting a higher quality ATV signal using a newly assigned 6 MHz channel with an NTSC signal on the original channel may prove more spectrum-efficient than implementing a single channel NTSC-compatible 6 MHz ATV signal (such as proposed by RCA or Del Rey) or a 3 MHz augmentation approach (such as the Glenn/NYIT system), since, in the longer run, ATV receivers would replace NTSC receivers, and, ultimately, the original channel used for NTSC broadcasting could be used for future growth of ATV service.

Since this scenario may prove to be the most effective way to implement a competitive quality HDTV system, the common misunderstanding that "non-compatible" systems are inherently less desirable should be dispelled, and the Commission should

continue to focus on the goal of continued NTSC service during the transition to ATV, by whatever means prove most effective to achieve that goal.

5. Any Terrestrial ATV Standard Adopted By The Commission Should Take Into Account The Need For Interoperability With Nonbroadcast Media.

Although a multiplicity of standards for various video distribution media carries the potential of retarding the growth of ATV generally, it is too soon to answer the complex question of whether a single ATV transmission standard for broadcast and nonbroadcast media is in the public interest. In that regard, the Advisory Committee should consider the costs and benefits of a single national transmission standard pending research and testing of an appropriate terrestrial ATV broadcast standard.

However, there is no gainsaying the fact that the television broadcast service will continue to operate in an environment in which the viewer has access to various nonbroadcast sources of video programming. In these circumstances, CBS believes that there is general agreement that it would be in the public interest for various means of video programming distribution to be conveniently interoperable, so that neither the distributor nor the consumer is faced with unnecessary costs.

This interoperability may be achieved in various degrees and in many different ways, and deserves further study. It is of particular importance to the broadcast and cable industry and to the public, of course, that a terrestrial ATV broadcast signal be passed by cable systems without degradation, since the number of viewers who view broadcast signals through cable retransmissions has reached 50% and continues to grow. In that regard, it is important that the cable industry bring its expertise to bear in the process of evaluating candidate terrestrial broadcast ATV transmission systems.

Further, it would be desirable in general for the Advisory Committee to work toward establishing appropriate points in the distribution path where the signals from all sources would follow the same signal format. Finally, it is important that the display format among the various media not differ substantially, because of the particularly high cost of the display element of a television set.

IV. ALLOTMENT AND POST ALLOTMENT ISSUES

In this section CBS addresses the Commission's questions regarding its legal authority to allocate additional spectrum for ATV broadcasting, the manner in which such allotment should be made, whether licensees should be free to enter agreements with other licensees to adjust their ATV allotments, and