

anticipated, less than or equal to NTSC spacings.<sup>100</sup>

38. Public Television also suggests that we designate relinquished NTSC channels as pairs for vacant noncommercial allotments.<sup>101</sup> However, at the point that NTSC channels must be relinquished by all broadcasters -- the point of conversion to ATV -- our transitional channel pairing scheme will have served its purpose and will be ended. Thus, there will be no need for pairing these noncommercial reserved channels at this point. Noncommercial as well as commercial stations will have returned to broadcasting on a single 6 MHz channel.<sup>102</sup>

#### B. LPTV and Translator Services<sup>103</sup>

39. There is no doubt, as low-power/translator interests argue, that LPTV and translator services provide important benefits, serving minority<sup>104</sup> and specialized<sup>105</sup> audiences, providing locally-based services to communities,<sup>106</sup> and generally furthering diversity.<sup>107</sup> On the other hand, we are in the process of enabling full-service stations that, by definition, reach much wider audiences than LPTVs and translators, to bring ATV, a major technological advance in broadcasting, to these audiences on a second channel. In order to do so, these full-service stations will temporarily need a substantial allocation of spectrum. As the Notice stated, it will be a challenge to provide all full-service licensees with an additional 6 MHz for

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100 Public Television Comments at 16 n.13.

101 Public Television Comments at 16 n.13.

102 See infra Section IV.A.

103 A low-power television station (LPTV) is a broadcast television facility with secondary service status that is authorized at maximum power levels lower than those of full-service television stations. Low-power stations may retransmit the programs of a full-service station and may originate programming. Translators are low-power stations that do not originate programming in excess of 30 seconds an hour and act to retransmit the signals of a full-service station. 47 C.F.R. § 74.701 (a), (f).

104 Telemundo Comments at summary page, 6; Communicasting Comments at 3-5; Channel 13 Comments at 1-2; KHR-TV14 Comments at 1; Polar Reply at 3.

105 St. Clair Comments at 3; CBA Comments at 1-2.

106 CBA Comments at 1-2; Channel 13 Comments at 1-3; Communicasting Comments at 3-5.

107 Telemundo Comments at 5-6. See also Third Coast Comments at 1. Some parties observe that displacement would have a negative economic impact on existing investment and employment, see Telemundo Comments at 8-9; Communicasting Comments at 5-6, as well as small business, see Third Coast Comments at 2.

ATV. Accordingly, as we stated in the Notice, and the record confirms, if ATV is to succeed, it will be necessary for new ATV assignments to displace LPTV and translator stations to some degree in the major markets,<sup>108</sup> although the impact is likely to be less severe in rural areas where there are fewer full-service stations. We are thus compelled to agree with those who believe that ATV implementation will require that LPTVs and translators, as secondary services, yield to new full-power ATV stations.<sup>109</sup>

40. We thus conclude that we must continue LPTV and translators' secondary status vis-a-vis ATV stations. We do not agree with those who argue that this is impermissible and unfair because the low-power service was not established as secondary to ATV stations, but only to certain land mobile services and to the full-power television broadcast service in existence at the time the service was created.<sup>110</sup> Our rules proscribe interference to "any TV broadcast station" operating on the same or adjacent channel.<sup>111</sup> The low-power television service was established for the specific purpose of supplementing conventional broadcast station coverage and we have always considered low-power service stations secondary.<sup>112</sup> The low-power service thus has had ample notice that it would have to yield to any full-service stations, without exception for the specific mode in which the full-service station transmits.<sup>113</sup> We also do not believe that the displacement required under our rules is a restraint of trade or monopolistic, as Polar contends.<sup>114</sup>

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<sup>108</sup> Notice, 6 FCC Rcd at 7030; Joint Broadcaster Comments at 33. Cf. CBA Comments at 4.

<sup>109</sup> EIA/CEG Comments at iii, 8-9; ATSC Comments at 5; Golden Orange Comments at 2.

<sup>110</sup> Third Coast Comments at 3-4; Island Reply at 3. See also Polar Reply at 4-5.

<sup>111</sup> 47 C.F.R. § 74.703 (b) (emphasis supplied). See also An Inquiry Into the Future Role of Low Power Television Broadcasting and Television Translators in the National Telecommunications System, 51 RR 2d 476, 486, 488-500 (1982) (Low Power Service Order), recon. granted in part on other grounds, 53 RR 2d 1267, recon. denied, 95 FCC 2d 657 (1983), aff'd sub nom. Neighborhood TV Company, Inc. v. FCC, 742 F.2d 629 (D.C. Cir. 1984).

<sup>112</sup> Low Power Service Order, supra, 51 RR 2d at 488.

<sup>113</sup> LPTVs and translators have been on notice since 1987 that ATV might increase demand for broadcast spectrum. In 1991, in order to minimize the potential disruption to the low-power service, we instituted a freeze on new low power station applications in major urban markets. Public Notice, Notice of Limited Low Power Television/Television Translator Filing Window From April 29, 1991, Through May 3, 1991, Mimeo No. 12124 (released Mar. 12, 1991).

<sup>114</sup> It is unclear what Polar means by "purposeful" displacement of low power stations. Polar Reply at 7.

41. We will not deviate from established precedent and afford a preference to translators over low power stations should displacement be required.<sup>115</sup> Our present rules balance the goals of maintaining translator service and encouraging new low power originating services.<sup>116</sup> We find that maintaining such a balance is in the public interest. Our present rules also make no distinctions among low-power service applicants based on the content of their programming.<sup>117</sup> We do not believe that this proceeding is the proper procedural context for development of a preference for foreign-language low power stations or that the record before us is sufficiently developed to permit adoption of such a rule, as some parties request.<sup>118</sup>

42. Based on Staff and Advisory Committee technical studies, we find that there is insufficient spectrum to permit LPTVs and translators to be included in the class of broadcasters initially eligible for an ATV frequency on either a primary or secondary basis or to factor in LPTV displacement considerations in making ATV assignments, as several parties argue.<sup>119</sup> Because LPTVs and translators are secondary to full-service stations, we do not believe it would be appropriate for us to require full service stations

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<sup>115</sup> Low Power Television and Translator Service, 102 FCC 2d 295, 308 (1984); Joint Broadcasters Comments at 33-35; MST Reply Comments at 16-17.

<sup>116</sup> Low Power Television and Translator Service, 102 FCC 2d at 308.

<sup>117</sup> See Low Power Television and Translator Service, 2 FCC Rcd 1278, 1288 n.14 (1987) (Displacement Order).

<sup>118</sup> See, e.g., Telemundo Comments at 11-12; Telemundo Reply Comments at 2. Cf. Religious Broadcasting Network, supra, 3 FCC Rcd at 4102 (1988) (describing showing required for addition of specialized and comparative programming issues in full-service comparative hearing context).

<sup>119</sup> 1988 OET Study, supra; 1989 OET Study, supra, Preliminary Analysis of VHF and UHF Spectrum Scenarios in Part III, Advisory Committee, Planning Subcommittee Working Party 3, Doc. 0174 (June 1991); Polar Comments at 2, 6-7; Polar Reply Comments at 6; Third Coast Comments at 4; Communicasting Comments at 2; Island Comments at 6; CBA Comments at 2. We also do not believe the suggestion that we displace permittees that have not yet built stations in order to accommodate the channel needs of displaced LPTV and translator licensees, in light of the spectrum needs of ATV, is likely to be of practical value. We thus decline to adopt it. CBA Comments at 1-2; 4; Polar Comments at 3; CBA Reply at 4; Telemundo Comments, Exhibit 1. In addition, we decline Third Coast's suggestion that we prohibit construction of authorized full-service NTSC and low-power stations in major markets once ATV allotments are made in order possibly to provide channels for displaced LPTVs. Third Coast Comments at 4. This proposal would be unfair to those who may have invested in reliance on the expectation of being awarded a license once they had constructed, provided, in the case of LPTVs, they also caused no interference to full-service stations.

displacing low-power service stations to compensate them, as some suggest.<sup>120</sup> In addition, as stated above, with the proposed exception of those awarded NTSC authorizations in the interim period extending from adoption of the Notice to initial assignment, we will not grant priorities to any entity for eligibility for an ATV channel after initial assignments are made.

43. At the same time, we recognize that LPTVs and translators may have a role in implementing ATV. Some parties suggest that the nature of their operations may make the low-power television station transition to ATV more economical and expedient than that of full-service stations.<sup>121</sup> Moreover, given the absence of multiple ownership restrictions on low-power stations, they will be free to add a second low-power ATV channel, provided no unacceptable interference to full-service stations or other protected operations occurs. In addition, we will permit LPTV and translator stations to broadcast in either the ATV or NTSC mode once ATV implementation begins.

44. We propose to require low-power television service stations to broadcast in the ATV mode at the time that full-service stations will be required to convert to ATV and cease broadcasting in NTSC.<sup>122</sup> Such a requirement would be consistent with our treatment of full-service stations, and would help spur ATV receiver penetration by increasing the sources of ATV programming available. Moreover, requiring low-power television service to implement ATV at the time of full service station conversion gives LPTVs and translators ample time to plan their transition. We seek comment on this proposal.

45. Recognizing the significant benefits that low power services bring to the public, we will, as CBA and others suggest,<sup>123</sup> take such steps to mitigate the likelihood and effects of displacement as are consistent with our other objectives in this proceeding. We thus will continue to permit a low power TV station displaced by a full-service station to apply for a suitable replacement channel in the same area without being subject to competing applications.<sup>124</sup> We will also continue our present policy of permitting low power service stations to operate until a displacing full-service ATV station is operational. As Telemundo suggests, we also will continue to allow displaced LPTVs to migrate to vacant NTSC channels, including vacant reserved noncommercial channels. We stress, however, as Public Television suggests, that LPTVs' use of such vacant spectrum is

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<sup>120</sup> Communicasting Comments at 2.

<sup>121</sup> Polar Comments at 6-7; Polar Reply at 6; St. Clair Reply Comments at 2-3.

<sup>122</sup> See infra Section IV.A.

<sup>123</sup> CBA Comments at 1-2, 4; Island Comments at 6; Third Coast Comments at 4; St. Clair Comments at 3-4 & n. 2.

<sup>124</sup> Displacement Order, supra; 47 C.F.R. § 73.3572 (a) (2).

secondary only.<sup>125</sup> Moreover, as Telemundo suggests, we will continue to permit LPTVs and translators to file non-window displacement relief applications to change their operating parameters to cure interference to an ATV station.<sup>126</sup> We also tentatively agree with arguments that certain specific NTSC interference protection rules could be re-evaluated and may afford low-power service interests some measure of relief.<sup>127</sup> We plan to initiate a separate proceeding to consider such changes. We decline, however, suggestions that we place additional requirements on full-service stations in order to minimize the likelihood of interference and displacement to LPTVs and translators.<sup>128</sup> It is the responsibility of the low-power service, as a secondary service, to yield to full-service stations where a conflict arises.

### C. Broadcast Auxiliary Service<sup>129</sup>

46. We appreciate the difficulties that broadcasters are likely to face in meeting their auxiliary service needs for both an ATV and an NTSC channel.<sup>130</sup> As the Advisory Committee observes, the broadcast auxiliary spectrum is already congested, most severely in major markets, where ATV implementation will first occur.<sup>131</sup> We have, however, taken pains to protect broadcast auxiliary spectrum allocations in the 1990-2110 MHz band, despite intense, competing need for additional spectrum by new services.<sup>132</sup> Moreover, there is no additional spectrum at hand for broadcast auxiliary

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<sup>125</sup> Public Television Reply Comments at 5-6 n.9.

<sup>126</sup> Telemundo Comments at 9-10; 47 C.F.R. § 73.3572 (a) (2).

<sup>127</sup> See, e.g., Third Coast Comments at 4, 5-6; Island Reply at 4; Communicasting comments at 2; St. Clair Reply Comments at 2.

<sup>128</sup> Island Reply at 4; Third Coast Comments at 4; Communicasting Comments at 2; St. Clair Reply Comments at 2.

<sup>129</sup> Broadcast auxiliary spectrum is used generally by television stations to convey their signals on a point-to-point basis from fixed or mobile facilities. Stations use this spectrum for such purposes as studio-to-transmitter links (STLs), and for ad hoc links between remote locations and the studio or transmitter.

<sup>130</sup> See, e.g., MST Reply Comments at 17-18; PS/WP3 Fifth Interim Report at 5-9.

<sup>131</sup> PS/WP3 Fifth Interim Report at 7. See also MST Reply Comments at 17-18.

<sup>132</sup> Notice of Proposed Rule Making, Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, 7 FCC Rcd 1542 (1992) (Spectrum Redevelopment Notice).

purposes.<sup>133</sup> Additional capacity may have to be obtained by, for example, reconfiguring existing microwave links for greater efficiency, making greater use of the higher frequency bands, use of optical fiber and combined optical fiber-microwave links, and employment of digital compression techniques to allow carriage of multiple NTSC signals in a single channel. We also suggest that broadcasters may increase their use of any existing available UHF spectrum for fixed auxiliary broadcast use.

#### D. Other Spectrum Issues

47. In order to ensure an adequate number of ATV channels in large border areas, some commenters urge that we initiate and/or intensify coordination efforts with Canada and Mexico.<sup>134</sup> Both the Advisory Committee and the Commission staff have begun informal discussions with Canada and Mexico. We plan to intensify these efforts and encourage the Advisory Committee to do the same.

48. Some commenters urge us to terminate Gen. Docket No. 85-172, which proposed further sharing, or reallocation, of UHF channels in eight large urban areas to private land mobile service.<sup>135</sup> We suspended action in that docket following initiation of this proceeding, out of concern that we not adversely affect spectrum options for ATV.<sup>136</sup> Those urging termination argue that the continued existence of Docket No. 85-172 creates an aura of uncertainty regarding the Commission's commitment to ATV and, given the potentially tight spectrum conditions for ATV in certain markets, can serve no useful purpose.<sup>137</sup> However, we agree with IMCC that it is premature to terminate Gen. Docket 85-172 at this time,<sup>138</sup> particularly in advance of a final allotment plan confirming predictions about spectrum needs for ATV. We thus decline to terminate Gen. Docket No. 85-172.

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<sup>133</sup> Although PS/WP3 cites possible sources of spectrum that may become available in the future, it cites no currently available sources. PS/WP3 Fifth Interim Report. In a related matter, ATSC requests that we defer a decision until certain Advisory Committee studies are completed. ATSC Comments at 5-6. In light of our consideration of the PS/WP3 Fifth Interim Report, and our evaluation of spectrum availability, we do not believe that such a deferral is necessary.

<sup>134</sup> Joint Broadcasters Comments at 32-33; EIA/ATV Committee Reply Comments at 18.

<sup>135</sup> Notice of Proposed Rule Making, Further Sharing of the UHF Television Band by Private Land Mobile Radio Services, 101 FCC 2d 852 (1985), Order, 2 FCC Rcd 6441 (1987) (Suspension Order). See, e.g., Joint Broadcasters Comments at 28, 36-38, introduction 5.

<sup>136</sup> Suspension Order, 2 FCC Rcd at 6442.

<sup>137</sup> MSTV Reply Comments at 19; Joint Broadcasters Comments at 36-37.

<sup>138</sup> IMCC Reply Comments at 1-6.

49. We also find that requests for reallocation of assertedly lightly used land mobile channels for television broadcast use are beyond the scope of this proceeding. These requests are properly the subject of a separate petition for rule making. Their consideration in the instant docket would lead to undue delay and complication of the numerous and significant issues directly raised by the advent of ATV.<sup>139</sup>

#### IV. CONVERSION TO ATV

##### A. Timetable for Conversion

50. Most, although not all, of those commenting on the issue agree in principle with the proposal in the Notice that we require broadcasters to "convert" entirely to ATV -- i.e., to surrender one 6 MHz reversion channel and broadcast only in ATV on the conversion channel once ATV becomes the prevalent medium.<sup>140</sup> Requiring the surrender of the NTSC reversion channel will promote the introduction of ATV and maximize ATV coverage areas.<sup>141</sup> Although, as Golden Orange states,<sup>142</sup> there is a benefit to affording the public a choice between ATV and NTSC programming during the transition years, suggesting that such a choice will remain permanently available would undoubtedly inhibit the growth of ATV. More significantly, there are likely to be competing uses for this spectrum which we will have to address.<sup>143</sup>

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<sup>139</sup> Joint Broadcasters Comments at 37-38; MST Reply Comments at 20-22. For the same procedural reasons, we decline St. Clair's requests to reallocate channel 37 (radio astronomy) for low power/translator and full service use or to reduce the land mobile reserve and use these channels for low power/translator services. St. Clair Comments at 3-4 & n.2.

<sup>140</sup> Notice, 6 FCC Rcd at 7031; Joint Broadcasters Comments at 24 & n.15; Fleet Call Reply Comments at 5-6; Schreiber Reply Comments at 3-4; ATSC Comments at 6; Zenith Comments at 5.

<sup>141</sup> Joint Broadcasters Comments at 24 & n. 15.

<sup>142</sup> Golden Orange Comments at 10-11, 13; Golden Orange Reply Comments at 1-3. See also EIA/ATV Committee Reply Comments at 9; FTC Reply Comments at 1, 2, 22-24, 27 (consumers may continue to find NTSC broadcasts warrant support even after their purchase of ATV receivers).

<sup>143</sup> See generally Spectrum Redevelopment Notice, supra. See also Schreiber Reply Comments at 3-4; Motorola Comments at 3-4; Phillips Reply Comments at 5; Telemundo Comments at 12. Cf. FTC Reply Comments at 24 (future termination of NTSC would encourage economic efficiency if there were other uses of spectrum of more value to consumers). We do not, however, here decide what the specific allocation of the surrendered spectrum should be, as some suggest. Cf. Public Television Comments at 11 (arguing that reallocated spectrum at time of ATV conversion should be used first to replace any noncommercial reserved channels that are deleted to accommodate ATV implementation). We believe that that it would be premature at this point to

Thus, contrary to requests that we defer addressing the issue of conversion,<sup>144</sup> we put broadcasters on notice that when ATV becomes the prevalent medium, they will be required to surrender their reversion channel and cease broadcasting in NTSC. By not requiring conversion until ATV achieves consumer acceptance, we allay FTC's uncertainty about whether ATV's costs will exceed its benefits to consumers.<sup>145</sup>

51. As proposed, we will cease issuing new NTSC licenses, including noncommercial NTSC licenses, once we have completed the initial assignment of ATV channels to existing NTSC licensees, *i.e.*, two years after an ATV standard or a final Table of ATV Allotments is effective, whichever is later.<sup>146</sup> From that point forward, in order to begin the transition to ATV, we will issue new television broadcast licenses for ATV transmission only. We do not agree with Public Television that by ceasing to issue noncommercial NTSC licenses, we are defeating the purpose of pairing, where feasible, ATV channels with vacant noncommercial allotments.<sup>147</sup> That pairing permits noncommercial applicants to continue applying for NTSC/ATV pairs until the point that initial ATV assignments are completed. Once that point is reached, noncommercial applicants will still be able to apply for the ATV channels that were set aside for the former NTSC noncommercial reserve.<sup>148</sup> In addition, should an existing broadcaster have forfeited its initial eligibility by, for example, failing to apply and construct within the required time, we will allow that broadcaster subsequently to apply, along with any other qualified parties, for any available ATV allotment or for an available ATV channel that will enable it to switch directly to an ATV channel at the time of conversion. If it is technically possible, a broadcaster may also use its existing NTSC frequency for this purpose. Finally, we will permit modifications to NTSC facilities after adoption of a final Table of Allotments for ATV channels provided they comply with technical criteria for the protection of ATV vacant allotments, applications and assignments.

52. We also conclude that we should set a firm date for conversion to

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decide the specific future use for this reclaimed spectrum.

<sup>144</sup> Sarnoff Reply Comments at 2-3; Westinghouse Comments at 5.

<sup>145</sup> FTC Reply Comments at 22, n. 43. FTC also observes that, for households purchasing an ATV receiver, continued NTSC broadcasts will permit continued use of the second or third NTSC receivers that these households might also have. FTC Reply Comments at 23.

<sup>146</sup> Notice, 6 FCC Rcd at 7031-32; Joint Broadcasters Comments at 24. As Joint Broadcasters suggest, we do not plan to lift the current freeze on NTSC applications in major markets. Joint Broadcasters Comments at 24.

<sup>147</sup> Public Television Comments at 23 n. 19.

<sup>148</sup> Those ATV channels, together with any VHF channels that had previously been set aside for noncommercial use, see P.L. No. 101-515, supra, would then constitute the noncommercial reserve.

ATV. We agree with Zenith that use of a firm date would keep administration simple, assure progress toward freeing spectrum on a timely basis and give broadcasters, consumers and manufacturers the benefits of a clearly defined planning horizon.<sup>149</sup> Our review of the record also persuades us that complete reliance on ATV receiver penetration rates as a triggering event for conversion, on either a nationwide or market-by-market basis, as the Notice also suggested, would not provide this same clear signal.<sup>150</sup>

53. We tentatively conclude that we should establish a date for conversion that is 15 years from the date adoption of an ATV system or a final Table of ATV Allotments is effective,<sup>151</sup> whichever is later.<sup>152</sup> This date should permit the majority of consumers who purchase NTSC receivers prior to the introduction of ATV to get full use of their NTSC equipment.<sup>153</sup> Moreover, by this point, we expect that the cost of ATV receivers should have declined from the level of initial prices,<sup>154</sup> as a result of increased consumer acceptance and higher volume sales. Preliminary studies also suggest

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149 Zenith Comments at 8-9.

150 Notice, 6 FCC Rcd at 7032.

151 As stated supra, Section II.F, we believe that it is essential that the principles governing allotment/assignment issues be resolved by the time an ATV standard is adopted.

152 As a matter of chronology, we envision the five-year application/construction period beginning to run from the time a Report and Order adopting an ATV standard or a Final Table of ATV Allotments becomes effective, whichever is later. After an ATV standard/Table of Allotments is effective, we will begin to accept broadcaster applications for ATV construction permits; the precise point at which such applications may be accepted, however, may vary depending on the particular assignment methodology which is adopted. See supra Section II.F. We tentatively plan to impose a 100 percent simulcast requirement no more than four years after this five year period ends. We have similarly proposed to commence the running of a 15-year transition to complete ATV conversion at the time a final Table of ATV Allotments or an ATV standard is effective, whichever is later.

153 See, e.g., EIA/CEG Comments at 11; Philips Comments at 10-12 (average life of a television receiver is 15 years); EIA Color Television Replacement Cycle Study at iii (Apr. 1985) (it takes about 15 years for half of all television sets to go out of use). Cf. Zenith Comments at 8-9 (consumers expect to use new NTSC receivers for seven to 10 years). See also CDE Comments at 7, 9 (sufficient transition needed to avoid making current NTSC receivers prematurely obsolete).

154 Zenith Comments at 7 (forecasting initial product acceptance in the giant screen segments of the industry, priced 50 to 100 percent above today's giant screen televisions); Philips Comments at 10-12 (ATV receivers will be "high end" products for a number of years after ATV broadcasting is initiated).

that, even absent imposition of a conversion deadline, significant numbers of consumers should have purchased ATV receivers by this point. Indeed, it is possible that alternative media such as VCRs and cable may seed the ATV receiver market even before ATV terrestrial broadcasts begin.<sup>155</sup> By the time our proposed conversion point is reached, broadcasters will have constructed an ATV transmission facility and should have implemented studio production capability.<sup>156</sup> It is also possible that inexpensive downconverters permitting the reception of ATV signals on conventional NTSC sets (in NTSC quality) will have become available, thereby enabling those without ATV television sets to continue to receive broadcast service without purchasing a completely new receiver.<sup>157</sup> We seek comment on our tentative conclusion that a 15-year conversion date would be appropriate and on the reasoning underpinning this

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155 For example, Working Party 5 of the Planning Subcommittee of the Advisory Committee (PS/WP5) as a preliminary matter projected 40 percent receiver penetration 10 years after one percent penetration is achieved, and PS/WP4 now believes this projection to be pessimistic. Fourth Interim Report of the Working Party 5 on Economic Factors and Market Penetration of the Planning Subcommittee of the Advisory Committee on Advanced Television Service (Mar. 4, 1992) at 7-8 (PS/WP5 Fourth Interim Report); PS/WP5 Fifth Interim Report at 4. Zenith states that one percent penetration could be reached as early as the second year after ATV receivers are introduced. Zenith Comments at 8. PS/WP5 states that the opportunity exists for alternative delivery media including cable, home video and satellite service to start the penetration of the consumer market with ATV service at the time, or shortly after, an ATV standard is established. PS/WP5 Fifth Interim Report at 6. IS/WP2 does not agree that ATV receiver penetration will be seeded by demand for receivers stimulated by other media, and projects consumer equipment availability two and a half to three years after Commission authorization of ATV broadcast service. Contribution to the Fifth Interim Report of the Implementation Subcommittee from Working Party 2 on Transition Scenarios (Jan. 31, 1992) (IS/WP2 Fifth Interim Report) at 12, in Implementation Fifth Interim Report, Attachment A. IS/WP2 is conducting further studies on consumer receiver development.

156 See supra Section II.E; CBS Study, supra at 17 (study conducted prior to the "use or lose" condition placed on meeting ATV construction deadline, finds that last group of stations to build ATV facilities will begin in year 6 and complete studio implementation in nine years). We also believe that this schedule should permit stations to depreciate NTSC equipment on a reasonable timetable, as CDE suggests. CDE Comments at 5-7.

157 Compare ATSC Comments at 6; Zenith Comments at 6 (envisioning availability of inexpensive downconverters) with Philips Comments at 13 n.11 (although reasonably priced ATV downconverters are a possibility, it is too soon to predict their availability or cost, or what consumer reaction to them would be).

"Upconversion" refers to programming converted from NTSC to ATV format.  
"Downconversion" refers to conversion from ATV to NTSC.

tentative finding.<sup>158</sup>

54. We also invite interested parties, particularly system proponents, consumer electronics manufacturers, and professional broadcast equipment manufacturers, to comment on the availability and costs they project during this 15-year period for equipment needed in the home and in the broadcast studio to receive and produce programming in the ATV mode. In particular we seek comment on the timing of widespread availability of ATV receivers, home downconverters, and ATV professional broadcast equipment, and what the cost of such equipment is expected to be (including any expected changes in price) during the 15-year conversion period. We also ask parties to comment on whether the possible availability of downconverters should influence the manner by which we assess ATV acceptance. Would the availability of reasonably priced ATV downconverters lessen concerns about the premature obsolescence of NTSC sets in a household?<sup>159</sup>

55. Notwithstanding our tentative conclusion to set a 15-year conversion date, we acknowledge that, at this point, it is difficult to predict with certainty how ATV implementation will occur.<sup>160</sup> Various developments relevant to the new ATV technology and to a date for conversion conceivably may emerge in the next several years.<sup>161</sup> While we will establish a firm conversion date in the next stage of this proceeding, we propose to review, in 1998, the propriety of that conversion date. This review should alleviate concerns about premature termination of NTSC.<sup>162</sup> It would also leave room for adjustment if ATV implementation should proceed more or less swiftly than we envision. We note that by 1998, we should have gained considerable experience concerning the transition to ATV: we will have selected an ATV system and established an ATV standard; ATV receivers should be available; and numerous broadcast

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<sup>158</sup> Adherence to a timetable for the conversion to ATV is also desirable because of the spectrum's potential to support new applications and services. If the value of the spectrum for those uses could be quantified, it might be expressed in terms of rents or fees for occupancy of additional ATV spectrum. The Commission, of course, does not plan to condition the use of conversion or reversion channels on any such payment. We underscore, however, that the spectrum to be used for the transition to ATV has significant value for other services and benefits and that any delay in reclaiming the reversion spectrum carries potential costs to the public.

<sup>159</sup> See, e.g., Weiss Comments at 9; EIA/ATV Committee Reply Comments at 9.

<sup>160</sup> See generally Joint Broadcaster Comments at 25-26; EIA/CEG Comments at 9-10; Philips Comments ii, 14; Fleet Call Reply Comments at 5-6.

<sup>161</sup> See generally EIA/CEG Comments at 10.

<sup>162</sup> See, e.g., Joint Broadcaster Comments at introduction 3, Zenith Comments at 8-9; EIA/CEG Comments at 9-10; MST Reply Comments at summary 1-2, 6-7.

stations should be transmitting in ATV.<sup>163</sup> By 1998, we also should have better data regarding the development of set-top converters and other factors relevant to determination of a timetable for recapture of NTSC reversion spectrum. This data will in turn enable us to weigh the opportunity costs of keeping the reversion spectrum with broadcasters for some additional period of time against the costs to broadcasters and consumers of fully converting to ATV. We seek comment on our proposal to review, in 1998, the suitability of the conversion date we will soon establish in the next stage of this proceeding.

#### B. Switching Frequencies

56. We agree with Joint Broadcasters that we cannot permit stations to switch their NTSC and ATV channels on an individual, voluntary basis.<sup>164</sup> As we stated in the Notice, it is likely that ATV-NTSC co-channel spacing will be shorter than ATV-ATV and NTSC-NTSC co-channel spacing. Unless all stations with co-channel facilities at less than the minimum ATV-ATV spacing in a given area switch together, switching ATV and NTSC frequencies may result in ATV stations with service areas permanently much smaller than would have been the case if switching had not been permitted.<sup>165</sup> Accordingly, we will permit switching of ATV and NTSC frequencies only on a case-by-case basis, after careful coordination insuring that other ATV service areas are not adversely affected and no other negative interference consequences result, and assuming that such switching harmonizes with any long-range plan for use of television spectrum that we develop.

57. Commenters generally oppose the suggestion that we should require all broadcasters to switch back to their original (formerly NTSC) frequencies at some future point.<sup>166</sup> Some argue that it would require significant additional investment<sup>167</sup> and lead to consumer confusion.<sup>168</sup> Other parties,

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<sup>163</sup> Fifth Interim Report at 16 (Advisory Committee Final Report expected February 1993); IS/WP2 Fifth Interim Report at 12 (general market availability of ATV receivers projected two and a half to three years after order selecting system); PS/WP5 Fifth Interim Report at 6 (there is some doubt that cable systems would introduce ATV service before local broadcast ATV service is in operation; however, a limited inauguration of ATV cable service is planned for 1992); see discussion supra Section II.E on application and construction periods.

<sup>164</sup> Joint Broadcasters Comments at 26-27 & n.18.

<sup>165</sup> Notice, 6 FCC Rcd at 7033. See also Zenith Comments at 10-11.

<sup>166</sup> Joint Broadcasters Comments at 27; Zenith Comments at 10; Golden Orange Comments at 6; Brandenton Comments at 4. See also Lippman Comments at 4 (opposing switching if NTSC channels are VHF).

<sup>167</sup> Joint Broadcasters Comments at 27; Zenith Comments at 10-12 (observing that after NTSC ceases, broadcasters will be able to operate ATV in a much more efficient manner).

however, advocate requiring broadcasters to switch to new channels so that all ATV operations can be reaccommodated in the most spectrally efficient manner. These parties advocate establishment of a contiguous UHF allocation.<sup>169</sup> We agree, however, with those parties who counsel that we cannot know the relative value of ATV broadcasts in the VHF band as opposed to the UHF band until after we develop practical experience with this new technology.<sup>170</sup> As ATSC states, some predict that digital transmission will virtually eliminate the advantages of VHF over UHF. In such case, we might want to avoid the added expense to broadcasters that a switch to VHF would cause, and to consider other uses for that spectrum.<sup>171</sup> We will thus wait until ATV implementation is underway and we have practical experience on which to base our judgments, to decide whether, at some future point, we should require or permit broadcasters to switch frequencies.

## V. SIMULCASTING

58. The Notice stated our belief that ATV implementation should be structured to protect the existing investment in consumer equipment so that consumers are not prematurely forced to purchase new receivers to enjoy top quality over-the-air television programming. We stated that a simulcast requirement (under which at least some amount of programming would have to be broadcast simultaneously over both the NTSC and ATV channels) would be one means of achieving this goal. We thus sought comment on the degree of simulcasting, if any, we should require and on whether there were any other equally effective ways to protect investment in NTSC equipment.<sup>172</sup> After reviewing the comments on this issue, we conclude that we should require 100 percent simulcasting of the programming on the ATV channel at the earliest appropriate point. For the reasons given below, we tentatively conclude that this 100 percent requirement should be adopted no later than four years after the ATV application/construction period for preferred allotments has passed, and we seek comment on whether we should permit broadcasters some initial flexibility prior to this point.

59. A simulcast requirement will help ensure that consumers are not prematurely deprived of the benefits of their existing television receivers

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511 Zenith Comments at 11.

169 Lippman Comments at 4; Golden Orange Comments at 5-6 & n.4, 7 & n.5, 9. Golden Orange favors a single contiguous UHF ATV band allocation and a second band for stations that it argues should be permitted to choose to continue in NTSC. Joint Broadcasters argue that Golden Orange's proposed means of reconfiguring the UHF and VHF bands is not technically feasible. Joint Broadcaster Comments at 27.

170 Westinghouse Comments at 5; ATSC Comments at 7. See also Philips Comments at iii (opposing both surrender of NTSC channels and repacking).

171 ATSC Comments at 7.

172 Notice, 6 FCC Rcd at 7033.

and other devices. In addition, we underscore that ATV is not a separate television service and will not result in the permanent grant of two 6 MHz channels to existing broadcasters. We intend to reclaim the reversion channel as soon as possible. Requiring simulcasting will help us to do so by minimizing broadcaster and consumer reliance on the ATV channel as a separately programmed service. Thus, we firmly disagree with Golden Orange that we should continue to permit NTSC stations to continue indefinitely and with different programming.<sup>173</sup> In addition, a simulcast requirement will give added impetus to ATV receiver penetration by eliminating the need for dual-mode receivers capable of receiving both NTSC and ATV. It will thereby help lower the cost of ATV receivers, which in turn should spur increased penetration. Thus, simulcasting will not only protect existing consumer investment in NTSC equipment, but also facilitate consumer purchase of new ATV receivers. Our ultimate goal, therefore, is to require simulcasting of 100 percent of the programming on the ATV conversion channel as soon as is appropriate.

60. In this regard, we tentatively conclude that we should impose a 100 percent simulcasting requirement no later than four years after the five-year ATV application/construction period for preferred allotments has passed.<sup>174</sup> At this point -- nine years after a standard becomes effective -- we will have afforded broadcasters sufficient time in which to explore the potential of this new technology, and ATV should have established itself.<sup>175</sup> Thus, the need to afford broadcasters some flexibility in starting up ATV operations will have diminished. On the other hand, ATV receiver penetration, and hence revenues from ATV programming, should be increasing. With the ascendance of the ATV channel, the need to protect consumer investment in existing NTSC equipment will increase. As the ATV channel begins to produce its own revenues, the need to insure the surrender of the reversion channel also will increase. Requiring 100 percent simulcasting at this point will serve our twin goals of protecting consumer investment in NTSC equipment and insuring spectrum efficiency. We accordingly seek comment on our plan to require 100 percent simulcasting no later than four years after the initial five-year

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<sup>173</sup> Golden Orange Comments at 12-13; Golden Orange Reply Comments at 5. See supra Section I.A.

<sup>174</sup> The simulcast requirement would begin to run on a nationwide basis. We would not make exceptions to the simulcast requirement for individual stations that obtain extensions of their construction permits. We believe that piecemeal implementation would, to the detriment of the viewing public, prove too disruptive to programming sources that are supplied nationwide.

<sup>175</sup> See generally CBS Study, supra, at Table 11 (in year six -- five years after first stations begin construction, 100 percent of TV households should be able to receive ATV service from stations in their market); see also PS/WP5 Fifth Interim Report, supra, at 6-7 (opportunity exists for alternative delivery media, i.e., cable, home video and satellite service, to start the penetration of the consumer market with ATV service at the time, or shortly after, FOC establishes an ATV standard); see also discussion supra note 155 (discussing preliminary projections of ATV receiver penetration).

application/construction period has passed.

61. At the same time, we recognize that there may be a need for some initial flexibility in programming the ATV channel to permit the development of equipment and programming for this new technology and to attract consumer interest. In the early stages of ATV implementation, it is unclear whether all stations could or will initially have the program sources or technical capability to simulcast all their programming.<sup>176</sup> In addition, some parties suggest that the quantity and/or quality of ATV programming is likely to be a driving force in consumer acceptance of this new transmission mode.<sup>177</sup> Moreover, broadcasters are likely to need some freedom to explore the dimensions of the new ATV technology, to use it creatively and to realize its full potential.<sup>178</sup> In order to develop and produce the programming that will best exploit the benefits of ATV and attract consumers to this new technology, broadcasters may need some initial reprieve from a full simulcasting requirement. Moreover, regulation to protect consumer investment in existing NTSC equipment may well be unnecessary in the early stages of ATV implementation. In these early stages, stations will have every incentive to

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<sup>176</sup> If, for example, most stations receive their ATV programming from a separate, second program feed (be it network or some other program source), they may not have the capability at the outset to upconvert their non-network programming from NTSC to ATV. In addition, stations may need several years to implement full ATV production capability in their studios. CBS Study, supra at 6-7, 17 & Figure 12 (last group of stations to implement ATV taking nine years to implement ATV studio production capability). Manufacturers also may need some time to develop such equipment and to produce adequate supplies for all stations.

<sup>177</sup> Westinghouse Comments at 5; EIA/CEG Comments at iii-iv, 5, 12; ATSC Comments at 6; EIA/ATV Committee Reply Comments at 11-12.

<sup>178</sup> See generally FTC Comments at i, 25-26, 28; Public Television Comments at v-vi, 21, 29-30. Cf. ATSC Comments at 8. Public Television suggests that certain types of programs, e.g., a program focusing on Albrecht Durer's etchings, would be particularly effective on ATV, with the higher resolution images it affords. Public Television also suggests that ATV offers a range of programming options not possible with NTSC format, by e.g., reducing the need for close-ups, and, through its wider aspect ratio, permitting scenes with expansive backdrops. Public Television Comments at 29-30. The early stages of ATV, when there are relatively low audience numbers for the ATV channel, might prove a suitable time for broadcasters to experiment and develop a facility with the new features of ATV technology without jeopardizing NTSC programming serving relatively large audiences. It is also possible that the production skills and program selection most appropriate for ATV may not always transfer well to the NTSC mode. Permitting broadcasters some initial freedom from simulcasting would enable them to gain some experience with the differences between ATV and NTSC and, subsequently, to produce simulcast programs that well serve viewers of both modes.

maintain their NTSC programming,<sup>179</sup> and ATV receiver penetration (and consequently viewership and advertising revenues) will be relatively low.<sup>180</sup> Thus, broadcasters will surely retain a substantial financial incentive to maintain the quality of their relatively more lucrative NTSC programs.

62. We therefore seek comment on one alternative that would have us phase in our simulcasting requirement, permitting broadcasters to make adjustments in a gradual fashion. Under this staggered approach, we would allow broadcasters complete flexibility in programming the ATV channel during the first two years after the initial five-year application/construction period has passed. However, as ATV implementation progresses, ATV receiver penetration is likely to increase and the need for regulatory intervention to protect existing consumer investment and ensure our ability to reclaim the second 6 MHz channel becomes more acute. Thus, starting two years after the initial ATV application/construction deadline for existing broadcasters has passed<sup>181</sup> -- seven years from the time a Report and Order adopting an ATV standard becomes effective -- we would require broadcasters to simulcast 50 percent of each day's programming. This 50 percent requirement would continue to afford broadcasters some flexibility as they implement full ATV production capabilities, but would also prompt them to prepare for complete conversion to ATV technology by ensuring that they do not use the second 6 MHz channel to develop a separate program service. In addition, the phased-in 50 percent simulcast requirement would enable us to safeguard consumer interests in the long-term, when ATV overtakes NTSC, by protecting the public's investment in NTSC technology. For the reasons discussed above, the 50 percent simulcasting requirement then would be increased to a 100 percent requirement two years later, at a point nine years after an ATV standard becomes effective. We seek comment on this proposed approach.

63. We also seek comment on other alternative schedules, including an approach that would adopt a full simulcasting requirement earlier than four years after the application/construction period has passed. An earlier adoption of a 100 percent simulcast requirement would appear to strengthen our ability to reclaim one 6 MHz channel at conversion. If the necessary production and conversion equipment is available two years after the initial

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<sup>179</sup> Joint Broadcasters Comments at 29; Public Television Comments at v-vi, 29-30; ATSC Comments at 8; EIA/CEG Comments at iii-iv, 12; EIA/ATV Reply Comments at 11.

<sup>180</sup> Joint Broadcasters Comments at 29; EIA/CEG Comments at iii-iv, 12; FTC Reply Comments at i, 25-26, 28. At this point, much of the programming on the ATV channel may well be converted NTSC programming. Weiss Comments at 10; Westinghouse Comments at 6 (traditional programming (such as news) may not be immediately available in ATV format).

<sup>181</sup> See generally ATSC Comments at 8 (as time progresses and more consumers purchase new equipment, broadcasters may air alternative programming to provide consumers greater benefit from their purchase, and at this stage, the Commission will need to protect the viewer who has not yet purchased ATV equipment).

five-year application/construction ends, or even earlier, it might be technically feasible to move to a 100 percent simulcast requirement at such point. We seek comment on such an approach and the projections as to the availability of necessary hardware and software that underlie it. We also ask interested parties to comment on whether broadcasters would, regardless of technical feasibility, need some reprieve from a 100 percent simulcast requirement after the initial application/construction period passes to explore the creative potential of the ATV mode, to attract viewers to ATV, and to insure their ability to recoup their investment in ATV implementation.

64. We also seek comment on other proposed approaches to affording broadcasters flexibility in developing ATV technology. For example, we might require a broadcaster to air the same programming on the ATV and NTSC channels, but permit flexibility with respect to time of airing or material included. The guiding policy under such an approach would be to ensure that the NTSC viewer had an opportunity to receive the same programming available to ATV viewers during the early phase of ATV implementation. Under this approach, we would broadly define the "same time" at which simulcast programs are required to air, *e.g.*, as the same 24-hour period. As Joint Broadcasters suggest, we would define "same program" as one which has as its basis the same underlying material.<sup>182</sup> Thus, variances between programs accommodating the special nature of ATV or NTSC, such as different aspect ratios, angles or numbers of cameras, or commentary<sup>183</sup> would be permitted. We might also define "program" to exclude commercials and promotions<sup>184</sup> and to include primary material such as movies, news, sports, and entertainment shows. We also seek comment on whether programming subject to a simulcast requirement should be of some minimal length and, if so, what an appropriate length would be. For example, would it be appropriate to apply a simulcast requirement to programs of five minutes or more in length? Should the obligation be even broader, encompassing one-minute news breaks for example, or narrower, applying to programs perhaps of 15 minutes or more in duration? These proposed definitions regarding the timing and content of simulcast material would give broadcasters added flexibility and would alleviate concerns that a simulcasting requirement will have a chilling effect on program content or raise First Amendment concerns.<sup>185</sup> We seek comment on these proposals. If we do adopt such an approach, we seek comment on whether it would remain necessary to "phase in" a full simulcasting requirement, as proposed above, to afford broadcasters the flexibility they may need to implement ATV.

65. As CapCities suggests, we also tentatively conclude that, from the

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<sup>182</sup> Joint Broadcasters Comments at introduction 3-4, 28, 30.

<sup>183</sup> Different commentary might be appropriate where different camera angles are used in the NTSC and ATV versions of the same event, *e.g.*, an athletic competition.

<sup>184</sup> ATSC Comments at 8; Joint Broadcasters Comments at introduction 3-4, 28, 30.

<sup>185</sup> Public Television Comments at v-vi, 29-10; ATSC Comments at 8.

outset, upconverted NTSC programming on broadcasters' second 6 MHz channel must be simulcast programming.<sup>186</sup> We are awarding broadcasters a second 6 MHz channel on an interim basis to permit them to make a transition to ATV. We see no reason to permit use of the second channel for non-ATV programs that differ from those broadcast on the associated NTSC channel. Thus, in the event we adopt a phased-in simulcast requirement, we would nonetheless expect programming on the ATV channel to take full advantage of the technical capabilities of the ATV mode. We seek comment on these tentative conclusions. We also seek comment on the types of programming which would take such full advantage of the ATV mode. For example, such programming might include: (1) programs produced in film and directly converted to the ATV mode; (2) programs originally produced on tape in the ATV mode; and (3) programs produced in the ATV mode live. We ask interested parties to comment on what other types of programs, in addition to these three categories, would take full advantage of the technical capability of the ATV mode.

66. As we assess the impact of the various alternatives for adopting a simulcast requirement, we are particularly interested in their effect on consumer interest in ATV and on ATV receiver penetration. The more swiftly ATV receiver penetration increases, the more rapidly we will be able to reclaim one 6 MHz channel. We thus are most concerned that we receive detailed comments from electronics manufacturers on the desirability of any given simulcast approach. In addition, we seek detailed comment, especially from professional equipment manufacturers, regarding the speed with which cost-effective equipment permitting upconversion of NTSC programming and downconversion of ATV programming will be available. We also ask for detailed information, particularly from consumer equipment manufacturers, regarding the extent to which inexpensive downconverters for home use are expected to be readily available. We ask interested parties, particular consumer equipment manufacturers, to comment on the likelihood that dual mode ATV/NTSC receivers will be developed, and the relative cost of such a dual mode receiver as compared with an ATV-only receiver. Finally, we ask interested parties, particularly the programming community, to comment on whether and when a supply of ATV-capable programming is expected to be readily available to broadcasters and consumers.<sup>187</sup>

67. In a related matter, CapCities requests suspension or waiver of Commission rules governing the network/affiliate relationship and contractual negotiations to permit a network to link affiliate clearance or preemption of a program in one format (NTSC or ATV) to clearance or preemption in the other format.<sup>188</sup> These particular rules are at issue in a pending Commission proceeding addressing the need to reform our existing broadcast rules.<sup>189</sup> We

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<sup>186</sup> CapCities Comments at 4-5.

<sup>187</sup> See supra note 176 and associated text.

<sup>188</sup> CapCities Comments at 2-3. 47 C.F.R. §§ 73.658 (a), (d), (e).

<sup>189</sup> Notice of Inquiry, Review of the Policy Implications of the Changing Video Marketplace, 6 FCC Rcd 4961 (1991).

will therefore not consider relaxation of these rules in this docket at this time. After a decision has been reached in the TV Marketplace proceeding, we will consider in this rule making any specific ATV-related questions that remain, if necessary.

## VI. PATENT LICENSING AND RELATED ISSUES

68. The Notice stated our belief that, in order to generate the volume of equipment necessary for ATV service to develop widely, the patents on any winning ATV system would have to be licensed to other manufacturing companies on reasonable terms.<sup>190</sup> The consensus among the commenters is that the winning proponent should adopt such reasonable patent licensing policies.<sup>191</sup> There is, however, some divergence of opinion as to the degree to which regulation is required, either now or at some future point, to ensure that reasonable patent licensing policies are indeed adopted. The ATV testing procedures already require proponents to submit, prior to testing, a statement that any relevant patents they own would be made available either free of charge or on reasonable, nondiscriminatory terms.<sup>192</sup> Contrary to the views of

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<sup>190</sup> The technology, intellectual property, communications and competition policy questions generated by patent licensing and related issues in the context of selection of an ATV standard have been brought to the attention of other expert agencies, including the Department of Justice, and the Department of Commerce. Letter to Thomas J. Sugrue, Esq., Acting Assistant Secretary for Communications and Information, United States Department of Commerce, from Kenneth Robinson, Senior Legal Adviser to the Chairman, Federal Communications Commission (dated Feb. 11, 1992); Letter to Nancy H. Mason, Deputy Undersecretary, Technology Administration, United States Department of Commerce, from Kenneth Robinson, Senior Legal Adviser to the Chairman, Federal Communications Commission (dated Feb. 11, 1992); Letter to Constance L. Robinson, Esq., Chief Communications and Finance Section, Antitrust Division, United States Department of Justice, from Kenneth Robinson, Senior Legal Adviser to the Chairman, Federal Communications Commission (dated Feb. 11, 1992).

<sup>191</sup> EIA/CEG Comments at iv; Blonder Comments at 2; FIT Comments at 1, 5; Philips Comments at iv.

<sup>192</sup> The Advisory Committee ATV Test Procedures Test Management Plan at § 2.1 requires that proponents follow American National Standards Institute (ANSI) patent policies in certifying to the availability of relevant patents they hold. ANSI requires assurance that:

- (1) A license will be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or
- (2) A license will be made available to applicants under reasonable terms and conditions that are demonstrably free of any unfair discrimination.

ATV Test Procedures Test Management Plan, Appendix A, § D.2 (Sept. 25, 1990,

those advocating greater regulatory involvement,<sup>193</sup> we find that these requirements adequately safeguard the consumer and competitive interests in reasonable availability of relevant patents, so far as is currently possible.

69. One party suggests that there will be powerful marketplace incentives which will induce a winning proponent to adopt reasonable patent procedures.<sup>194</sup> Although this may well prove true, this issue is critical to ATV implementation and to the consumer and competitive interests implicated. When we officially select an ATV system, therefore, we will condition that selection on the proponent's commitment to reasonable and nondiscriminatory licensing of relevant patents. Nonetheless, we find it premature to decide now, as some commenters advocate, whether we can or should exercise greater regulatory control over a selected system's patent practices.<sup>195</sup> Finally, we recognize that prompt disclosure of a winning system's technical specifications may be necessary to permit the mass production of ATV equipment in a timely fashion. The Advisory Committee indicates that industry efforts are underway to designate a standards-setting group to undertake the formulation of such specifications.<sup>196</sup> We encourage such efforts and will monitor the progress of this industry activity.

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193 Blonder Comments at 2; FIT Comments at 5-6.

194 EIA/CEG Comments at 13-14.

195 Compare Blonder Comments at 2 and FIT Comments at 5-6 (supporting Commission involvement in patent issues) with Philips Comments at 15 (raising the question of the Commission's authority to address complex patent issues). See also Zenith Comments at 15 (alternatively advocating regulation of patent licensing that would favor firms using domestically-made ATV components). Cf. Blonder Comments at 3 (advocating definition of "American manufactured" for purposes of determining import duties on ATV products only if United States content is over 75%).

Some parties suggest that third party patent rights may complicate patent licensing issues. Although we decline to address the question in the absence of a particular factual context, we observe that to the extent a winning proponent has obtained sub-licensing rights from a third party, we would expect such sub-licensing also to occur on reasonable, non-discriminatory terms. See generally EIA/CEG Comments at 13; EIA/ATV Committee Reply Comments at 12; Philips Comments at 14,15.

196 Fifth Interim Report at 21.

## VII. OTHER ISSUES

### A. Compatibility

70. The Notice asked to what extent we could or should encourage compatibility of a terrestrial broadcast ATV system with other media, including other video delivery media, and with computer applications and other forms of data transmission.<sup>197</sup> The consensus among commenting parties generally favors such compatibility.<sup>198</sup> Despite the conceptual consensus on the value of compatibility, however, some parties caution that we should not permit compatibility concerns to drive our ATV policies to the detriment of other equally important values.<sup>199</sup>

71. Parties disagree on the need for us to take additional regulatory action to promote compatibility at this time. We recognize, as do the vast majority of commenters, the importance to any ATV system we adopt of

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<sup>197</sup> Notice, 6 FCC Rcd at 7034.

<sup>198</sup> See, e.g., ATSC Comments at 9-10; Tennenhouse Comments at 1-2. One party believes that compatibility is necessitated by the breakdown in traditional boundaries between industries such as broadcast, telephone, cable and entertainment. Phillips Comments at 2. Others believe it will further First Amendment interests. See, e.g., Donahue Comments at 1-3. CTW believes it will enable consumers to take advantage of developments allowing access to multiple sources of information simultaneously. See CTW Comments at 3-4. IAF believes that compatibility will permit interactive applications for education, health and other social information needs. See IAF Comments at cover page, 2. Some argue that alternative media are growing increasingly important (see EIA/ATV Committee Reply Comments at 13-14) and that compatibility will avoid consumer frustration over multiple, incompatible standards for cable, satellite and VCRs (see e.g., EIA/CEG Comments at iv, 14-15). Some parties argue that compatibility will help spur economic competitiveness (see Donahue Comments at 1-3) and industrial growth (see McKnight/Solomon Reply Comments at 3-5). Some state that compatibility with other media will lead to increased penetration levels by helping to justify the initial investment in ATV receivers. See, e.g., CTW Comments at 3-4. Some view compatibility as extending across different applications and industries. See, e.g., Comsat Comments at 1-3. Some see it extending over time, preventing obsolescence. See, e.g., Khosla Comments at 1-3; Liberty Comments at 3.

<sup>199</sup> See, e.g., Schreiber Further Reply Comments at 3. Some cite the need for speedy implementation of ATV as a competing value. Zenith Comments at 16-17; ATSC Comments at 9. But cf. Gerovac Comments at 2 (opposing the view that addressing compatibility issues now will cause needless delay in initiation of ATV). Some also cite the "primary consumer interest" in new technology for television, see, e.g. ATSC Comments at 7, or the cost, quality or coverage of an ATV system, see, e.g., EIA/ATV Committee Reply Comments at 14, as competing concerns.

compatibility with other transmission forms and media applications. The Advisory Committee and other bodies, including the EIA, SMPTE, and ATSC, are presently addressing these issues.<sup>200</sup> PS/WP4 plans to initiate a case-by-case analysis of each proponent system's suitability "for cost-effective, optimum quality interoperation with alternative delivery media and applications, including analysis of economic and social impacts."<sup>201</sup> This plan appears as adequate an answer to Liebhold's request for a case-by-case evaluation of ATV systems as is possible at this stage.<sup>202</sup> PS/WP4 has also recommended the adoption of headers and descriptors.<sup>203</sup> It is monitoring the work of SMPTE, which has recently completed a feasibility study on ways to implement this concept, and plans further studies in this area.<sup>204</sup> These efforts appear to respond as adequately as is feasible at this procedural juncture to Gerovac's advocacy of a universal self-identifying header mechanism to be incorporated into an ATV standard.<sup>205</sup> Moreover, the Advisory Committee selection process already takes compatibility concerns into account. Interoperability and extensibility are among the ten selection criteria the Advisory Committee will

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<sup>200</sup> Fifth Interim Report at 4-5; Advisory Committee on Advanced Television Planning Subcommittee Working Party 4 Interim Report (Dec. 31, 1991) (PS/WP4 Interim Report) in Fifth Interim Report, Appendix G; EIA/CEG Comments at 14-15; "SMPTE Approves Task Force Report on Headers/Descriptors," Society of Motion Picture and Television Engineers, Press Release (dated Feb. 7, 1992) (describing report of Task Force on Headers/Descriptors and noting ongoing work of task force on Digital Image Architecture) (SMPTE Press Release); ATSC Comments at 9, Annex 1 (Status Report of ATSC Specialist Group on Interoperability and Consumer Product Interface (T3/S2) (T3/S2 Report) dealing with a wide-range of alternative media issues including cable television, audio, set-top converters, direct broadcast satellites, pre-recorded media, fiber optic delivery of ATV and microwave media).

<sup>201</sup> PS/WP4 Interim Report at 7.

<sup>202</sup> Liebhold Comments at 1.

<sup>203</sup> A header is a sort of digital label which identifies the type of data (e.g., still image, audio, type of auxiliary information) and type of processing performed on the data (e.g., video format compression, conditional access technique if any) which the signal is transmitting. A descriptor details the technical characteristics of the data (and any processing done thereon) being sent. See generally PS/WP4 Interim Report at Table 2, Attachment A, at 6; SMPTE Press Release, *supra*. Headers and descriptors may be useful in achieving compatibility by permitting different amounts and kinds of data to be used by different applications and media.

<sup>204</sup> Report of the SMPTE Task Force on Headers/Descriptors (Jan. 3, 1992).

<sup>205</sup> Gerovac Comments at 1-2. Cf. Lippman Comments at 4-6 (call for meta-standard usable across technologies for interpreting algorithm specifics).

employ.<sup>206</sup> We encourage the ongoing work of the Advisory Committee, EIA, SMPTE and ATSC on compatibility issues. These industry efforts are critical to solving and achieving consensus on the numerous and complicated questions arising from our goal of approaching compatibility across media and over time. We do not believe it is necessary or would be productive at this stage in the progress of such activities for us to intervene, as some suggest.<sup>207</sup>

72. Most, although not all, parties commenting on the issue, perceive use of a digital format for ATV transmission as key to solving compatibility

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<sup>206</sup> These terms are further discussed infra note 207. The other eight criteria are (1) coverage area compared to NTSC, (2) percentage of TV licensees that can be accommodated, (3) transmission robustness, (4) audio/video quality, (5) cost to consumers, (6) cost to broadcasters, (7) cost to alternative media, and (8) scope of services and features. Letter from Robert Hopkins, Chairman of Advisory Committee Systems Subcommittee Working Party 4 (SS/WP4), to Richard E. Wiley, Chairman of the Advisory Committee on Advanced Television Service (dated Nov. 5, 1991). See also Minutes of Twelfth Meeting of SS/WP4 (Aug. 29, 1991) ("There is no consensus in the working party to apply weighting in selecting a proponent system").

<sup>207</sup> See, e.g., Schreiber Comments at 2-6. The Notice also sought comment on the desirability and importance to compatibility of an ATV system's possessing the qualities of interoperability, extensibility, scalability and harmonization. Notice, 6 FCC Rcd at 7034. The Committee for Open High Resolution Systems (COHRS), an informal ad-hoc group with members from the computer and telecommunications industries, government, and academia originated and advocated these terms. Most parties commenting on these qualities favor some or all of them. See, e.g., Brady Comments at 2; AT&T Comments at 6-7; Sarnoff Reply Comments at 2; Philips Comments at iv, 18; Liebhold Comments, Attachment; DemoGraFX Comments at 1; Staelin Comments at 1-3. McKnight/Solomon Reply Comments at 5. Many parties suggest definitions for, or characteristics that would be associated with these terms. The Advisory Committee has also been working in parallel on these definitions. It defines interoperability as "the capability of providing useful and cost-effective interchange of electronic image, audio and associated data: among different signal formats, among different transmission media, among different applications, among different industries, among different performance levels;" extensibility as "a property of a system, format or standards that allows future improvements in performance or format within a common framework, while retaining partial or complete compatibility among systems that belong to the common framework;" scalability as "the degree video and image formats can be combined in systematic proportions for distribution over communications channels for varying capacities;" and harmonization as "the coordination of different advanced image standards in an orderly process." PS/WP4 Interim Report, Definitions. Again, we do not believe it is appropriate to endorse specific definitions for, or aspects of, these attributes before the Advisory Committee completes the various tasks it has scheduled, and finalizes its recommendations, on this subject.

concerns.<sup>208</sup> DemoGraFX believes that system testing should be updated to test for varieties of digital imaging not originally anticipated, and that frame rates more compatible with 24 frames per second film should be considered.<sup>209</sup> Schreiber advocates the use of digital source coding and hybrid channel coding, believing that interoperability can be achieved by using signal representation in frequency space together with the ability to add or delete frequency components easily.<sup>210</sup> Sarnoff advocates an ATV system that uses a single video compression standard for all consumer and computer delivery media, arguing that this would be cost effective and would eliminate the need for multiple decoder types.<sup>211</sup> To foster compatibility with other video media, some parties advocate use of a common baseband video signal format.<sup>212</sup> Schreiber would mandate compatibility, requesting that we reconsider our tentative decision not to set standards for alternative media at this time.<sup>213</sup>

73. We agree with those commenters who recognize that for ATV to succeed, broad complementary ATV applications with other video media must exist.<sup>214</sup> We do not, however, believe it is appropriate at this stage of the

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<sup>208</sup> Compare Phillips Comments at 3-4; Staelin Comments at 1-2; Khosla Comments at 3; Lippman Comments at 1-3; DemoGraFX Comments at 1-5; CIW Comments at 1-2, 4; AT&T Comments at 6-7; GI Comments at 2, 6; Westinghouse Comments at 9; McAdams Comments at 1 (all favoring digital format) with Schreiber Comments at 2, 5-6, Appendix; Schreiber Further Reply Comments at 2-3; Schreiber Reply Comments at 3 (favoring alternative). However, some parties dispute the advisability of using digital channels for non-television purposes. Compare Lippman Comments at 1 (advocating scalable digital transmission that is suitable for television or non-television services) with AT&T Reply Comments at 6-7 (general purpose digital channels would cause additional fragmentation in television markets and disrupt television service if ATV channels are devoted to non-television uses) and with Zenith Reply Comments at 3 (concepts such as universal digital channels independent of line counts and frame rates serve only to derail progress in bringing world-leading ATV technology to American consumers and broadcasters).

<sup>209</sup> DemoGraFX Comments at 1-5.

<sup>210</sup> Schreiber Comments, Appendix at 12. Responding to AT&T, see AT&T Reply Comments at 4, Schreiber states that he does not advocate three-dimensional subband coding. He states that adequate performance as well as good interoperability can be achieved with two-dimensional subband coding and hybrid transmission. Schreiber Further Reply Comments at 2-3.

<sup>211</sup> Sarnoff Reply Comments at 2-3.

<sup>212</sup> ATSC Comments at Annex 3, 7, 9; COMSAT Comments at 2-3.

<sup>213</sup> Schreiber Comments at 2-3. See also Second Inquiry, 3 FCC Rod at 6536-37.

<sup>214</sup> Zenith Comments at 16.

Advisory Committee's ongoing work,<sup>215</sup> and with systems still being tested and developed, to consider these issues. To the extent parties may be advocating our consideration of a system different from any of those on the current test schedule,<sup>216</sup> they should respond specifically to our request for comment on the Advisory Committee's report on new developments.<sup>217</sup>

#### B. Alternative Media

<sup>74</sup> NCTA raises concerns regarding effective transmission of ATV over cable.<sup>218</sup> We agree with NCTA that cable delivery of a quality ATV signal is critical to public acceptance of ATV.<sup>219</sup> We also agree with EIA/ATV Committee that, as a practical matter, any ATV system selected must support ATV carriage over cable systems.<sup>220</sup> Through its sponsorship of Cable Television Laboratories, Inc. (CableLabs), the cable industry has taken steps to ensure that the selected broadcast transmission system is compatible with effective cable carriage of the ATV signal.<sup>221</sup>

75. NCTA and ATSC both contend that the ability of proponent ATV systems to encrypt (scramble) cable programming remains an outstanding issue.<sup>222</sup> PS/WP4 has been assigned to study compatibility questions relating to non-broadcast media, including cable. As discussed supra, this group recently recommended use of headers and descriptors to convey both video and non-video information, an approach that would appear to facilitate transmission of encryption and decryption information. We ask the Advisory Committee to study and report back to us on the ability of the proponent systems to encrypt cable

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<sup>215</sup> See supra this Section.

<sup>216</sup> Cf. Schreiber Reply Comments at 5 (encouraging familiarization with European DAB experiments that use Coded Orthogonal Frequency Division Multiplex channel coding and referring to the possible use of multiplex techniques being tested at MIT in connection therewith).

<sup>217</sup> See infra Section VII.E.

<sup>218</sup> NCTA Comments at 3; NCTA Reply Comments at 2 n.1.

<sup>219</sup> Id. at 3.

<sup>220</sup> EIA/ATV Reply Comments at 19.

<sup>221</sup> CableLabs is conducting tests of the cable-related performance of the proponent ATV systems, in conjunction with the broadcast-related performance tests being done by ATTC and ATEL. CableLabs will also be undertaking cable field tests at the same time as broadcast fields tests are conducted, and will be the primary organization responsible for analyzing the cable test results. FCC Advisory Committee on Advanced Television Service Systems Subcommittee Fifth Interim Report at 13 (Systems Fifth Interim Report), in Fifth Interim Report, Appendix C.