6.4.4 Impulse Noise

Indicate for what carrier-to-(peak) noise ratio for which noise is just perceptible in the picture. What indirect effect(s) does strong impulse noise have?

6.4.5 Other

Is system more or less susceptible than NTSC system to interference from other services?

6.5 Susceptibility to Group Delay Errors

Measure system susceptibility to group delay errors between different frequency video waveform components (e.g., envelope delay)? Are some frequency components more critical than others?

6.6 Susceptibility to Nonlinear Distortion

Measure system susceptibility to nonlinear distortion of video waveform. Are some frequency components more critical than others?

6.7 Transmitter/Antenna Requirements

6.7.1 Required Number of Transmitters/ Antennas

Number of transmitters. Number of Antennas
If more than one, must antennas be co-located?

6.7.2 Complexity of Transmitter/Antenna

Are special techniques (e.g., quadrature modulation of visual carrier) employed? Is there a need for wideband antenna, ultralinearity, etc.?

6.7.3 Use of Present Transmitter/Antenna

To what degree of modification is necessary?

6.8 Bandwidth Requirements

6.8.1 Near Term

Example: 6 MHz + 4 MHz.

If more than one 6 MHz channel, is contiguous bandwidth a requirement?

6.8.2 Long Term

Example: 6 MHz + 4 MHz.

If more than one 6 MHz channel, is contiguous bandwidth a requirement?

6.9 Transmission Field Testing

What new image artifacts are introduced as a result of transmission? What system artifacts are made worse? Field testing should be performed to confirm laboratory results.

6.10 Coverage Relative to NTSC

What is the ATV coverage area relative to existing NTSC service? How is it achieved? If NTSC compatible, what is the compatible coverage area relative to existing NTSC

6.11 Gracefulness of Degradation

6.11.1 Video

Under increasing fringe conditions, is degradation abrupt or gradual? Does degradation of NTSC compatible picture approximate that of NTSC under the same conditions?

6.11.2 Audio

Under increasing fringe conditions, is degradation abrupt or gradual?

6.11.3 Audio vs Video

Under increasing fringe conditions, which first becomes unusable?

7. Suitability for Alternate Media Distribution

The main objective of the tests described in Sections 7.1 to 7.4 is to evaluate the attributes of a proposed ATV signal in order to determine how it can be interfaced with various media other than terrestrial broadcasting. To achieve this, the medium under consideration shall be characterized to establish the baseline parameters by which the performance of ATV systems can be compared.

One way of defining an unacceptable signal is by using the FCC's criteria for service grading contours A and B. It relates to the quality of service by considerations of field strength, receiver sensitivity and noise figure, and signal to noise ratios in the absence of interfering signals. (See NAB Handbook, Seventh Edition, page 2.7-204.) Modifications to the above criteria may be required to take into account the improvements in receiver technology.

7.1 Suitability for Cable Television Distribution

7.1.1 Channel Bandwidth: This defines the RF spectrum occupied by a complete composite ATV signal and specified in terms of half-power (3-dB), 20-dB and 40-dB bandwidths. Such bandwidths shall be specified for contiguous and non-contiguous channels, the primary channel and the augmentation channel. Modulation shall be varied and the spectral content shall be checked for bandwidth changes during static and dynamic modulation.

7.1.2 Cochannel Interference: Theoretically, since cable television is a "closed" medium, there should be no cochannel interference. However, "ingress," which is the penetration of off-air signals in poorly-shielded TV receivers or distribution paths, can corrupt the desired ATV signal. The effect of ingress between cochannel ATV and NTSC signals shall be investigated. This test is an extension of 6.4.2.

7.1.3 Adjacent Channel Interference: The objective of this test is to determine the mutual effect of adjacent channel interference among ATV and NTSC signals. This test is similar to 6.4.1 except that ratio between picture and sound (P/S) carrier levels in terrestrial transmission may be different from the P/S ratios used in CATV transmission.

7.1.4 Interference to/from other services: The ideal CATV system is "clean" in terms of ingress or egress. However, in practice the transmission of ATV signals require investigation because some bands (e.g., aeronautical band) require greater protection than others. Investigate how variations in ATV spectral density can affect the following bands:

7.1.4.1 Navigation/Aeronautical Bands
7.1.4.2 Amateur radio Bands
7.1.4.3 FM Band
7.1.4.4 Citizen's Band
7.1.4.5 Industrial Bands

7.1.5 Effect of micro-reflections: Reflections result from poor impedance matching between cables, amplifiers and other passive devices, which manifests as constant ghosts or echoes in the picture. Due to the coherent (6 MHz) nature of NTSC transmission, micro reflections are masked and are not readily visible in NTSC. The objective of this test is to find out how micro reflections appear in the ATV picture and whether or not such defects are tolerated by ATV viewers. Quantify if possible.

7.1.6 Intermodulation Distortion: This artifact is generated in amplifiers with nonlinear characteristics when two or more fundamental frequencies and harmonics are present. In NTSC transmission, such artifacts are well known, predictable, and they are currently factored into amplifier cascade design. In these tests, determine how Intermods are altered or created by ATV signals of various spectral contents, and determine if the interactions among NTSC and ATV signals cause objectionable artifacts.

7.1.7 Channel Loading: This relates to the maximum number of channels that can be carried in a CATV system. As loading is increased, intermodulation, cross modulation, composite triple beat and other spurious signals also increase. An objective of these tests is to consider the tradeoff between channel capacity and minimum acceptable signal quality. Note that channel bandwidth as in 7.1.1 can approximate channel capacity; but channel loading as described here provides a greater perspective of the exact number of channels that can be accommodated because it takes into account the acceptability of artifacts as ATV signals are added.

7.2 Suitability for Satellite Distribution

The objective of these tests is to determine if the ATV signal can easily interface with standard origination (uplink) facilities, satellite distribution systems such as C-Band and KU-Band, and various receiving equipment. Both commercial television distribution and satellite transmission to consumers shall be considered.

7.2.1 Baseband Video Bandwidth: This is defined as the half-power (3-dB) bandwidth occupied by the ATV video signal. In cases where audio (analog or digital) is embedded in the video, consider the overall composite baseband video signal bandwidth.

7.2.2 Baseband Audio Bandwidth: This is defined as the half-power (3-dB) bandwidth occupied by the ATV audio signal. Specify this bandwidth for each audio channel, whether analog or digital.

7.2.3 Audio Bandwidth Requirement: This is defined as the amount of baseband spectrum allocated to the aural portion of the ATV signal. This bandwidth may vary depending on the number of audio channels being carried, the frequency response of each audio channel and the method used to combine all audio channels.

7.2.4 Exciter Modifications: The objective of this test is to determine if the exciters currently used or existing in the market require modification(s) in order to accommodate the proposed ATV signal. Some considerations are: AFC requirements, sync, video levels, and frequency response.

7.2.5 Uplink Power Requirements: The objective of this test is to determine if the proposed ATV system requires changes in uplink power in order to properly saturate the satellite transponder while maintaining proper cross-polar/co-polar/adjacent channel/co-channel carrier-to-interference ratios.

7.2.6 Optimum FM Deviation: The objective of this test is to determine optimum deviations for existing satellite channel allocations.

7.2.7 Minimum C/N: The objective of this test is to determine the carrier-to-noise (C/N) ratio required for proper demodulation of the ATV signal in order to provide acceptable signal quality.

7.2.8 Minimum Antenna Size: The main objective of this test is to determine the smallest antenna size both at C-Band and KU-Band that can deliver reliable ATV signals with acceptable signal quality.

7.2.9 Satellite Receiver Requirements: The objective of this test is to determine the modifications that may be required of existing satellite receiver designs and manufacture. The ATV signal shall be evaluated to determine its impact on the receiver functions listed below. Quantify the associated costs if possible.

7.2.9.1 Clamping
7.2.9.2 Deemphasis
7.2.9.3 IF bandwidth

7.2.10 Compatibility w/ Satellite Security Systems: The objective of this test is to determine if the satellite security systems currently in use or in the market, can be used to secure the ATV signal. Some compatibility issues are: The ATV signal's ability to easily interface with the scrambling equipment at the origination (uplink) facility; and, the same ATV signal's ability to easily interface with existing de-scrambling equipment. The above shall be considered for both network television distribution and satellite television emmission to consumers. Some examples of existing satellite security systems are VideoCipher 1, VideoCipher 2, Oak Orion, Starloc, S/A A-MAC, B-MAC ... etc.

7.2.11 FM Channel Artifacts: While the effects of FM channel non-linearities are well understood for NTSC, the problems which will attend the use of ATV signal formats through FM channels must be investigated.

7.3 Suitability for Other Terrestrial Distribution Systems:

The purpose of the following tests is to evaluate the attributes of a proposed ATV signal and determine how it can be interfaced with other terrestrial media not including VHF/UHF broadcasting.

7.3.1 Amplitude-Modulated Microwave Links (AML)
Amplitude modulated links are specific applications of the Cable Television Relay Service (CARS) at 12.7 to 12.95 GHz for short-haul point-to-point transmission of up to 40 television channels per link. The ATV issues to consider are: the effects on channel capacity, distortions, interference and the compatibility with existing transmitter/receiver systems.

7.3.2 Frequency-Modulated Links (FML)
Frequency modulated links are coaxial cable wideband systems used as trunks for high-quality television transmission. Channel capacity depends on the frequency division multiplexing scheme. The proposed ATV system shall be evaluated for effects on channel capacity, distortions and compatibility with existing transmitter and receiver systems.

7.3.3 Microwave Distribution Service (MDS)
MDS is a common carrier point-to-multipoint AM microwave television distribution service. Channel one is at 2150-2156 MHz while channel two is at 2156-2162 MHz. Channel two may be 2156-2160 because 2160-2162 MHz is shared with directional radio systems authorized in other common carrier service. Determine if ATV can be accommodated as a secured, non-interfering service.

7.3.4 Multi-Channel MDS (MMDS)
MMDS shares the Instructional Television Fixed Service (ITFS) at 2550-2680 MHz. The FCC Rules and Regulations, Part 74, Subpart I govern the specifications of this service. Determine how many ATV signals can be accommodated in this frequency band and the possible impact on ITFS.

7.3.5 Fiber-Optic Cables (FO)
Fiber optics can be used for analog or digital transmission of ATV signals. Determine the maximum number of ATV channels that can be accommodated in a fiber strand using existing transmission schemes.

7.3.6 Telephone Co. Lines (TELCO)
In this section, investigate how common carrier telephone companies distribute television signals and determine how the proposed ATV system being evaluated may be accommodated in such distribution media.

7.3.7 Video Cassette Recorders (VCR)
This section considers current consumer VCR formats. Some issues under Compatibility are:

7.3.7.1 Playback only of ATV
7.3.7.2 Record/Playback of ATV
7.3.7.3 Record/Playback of both NTSC and ATV
7.3.7.4 Connector Interfacing requirement
7.3.7.5 Electronic (blackbox) Interfacing requirement
7.3.7.6 Audio Artifacts
7.3.7.7 Video Artifacts

7.3.8 Video Disk Recorders
In this section, only current consumer videodisk recorder/players shall be considered. Some issues are:

7.3.8.1 Playback only of ATV
7.3.8.2 Record/Playback of ATV
7.3.8.3 Record/Playback of both NTSC and ATV
7.3.8.4 Connector Interfacing requirement
7.3.8.5 Electronic (blackbox) Interfacing requirement
7.3.8.6 Audio Artifacts
7.3.8.7 Video Artifacts

7.4 Transmission Security

The basic objectives of this section are:

1) To investigate the compatibility of the ATV signal with security systems in various media other than terrestrial broadcasting; and,
2) To evaluate the ATV signal for transparency during secured transmission, including image reconstruction artifacts of both the center image and full aspect ratio image.

Current Video/Audio security techniques include:

1. Trapping
2. Jamming
3. Frequency Conversion
4. Video Inversion by line, field, or frame
5. Permutation by line, field, or frame
6. Rotation by line, field, or frame
7. Sync Elimination
8. Sync Alteration
9. Time/Frequency Compression
10. Digital Techniques
11. Mechanical
    (Switched Star topology using Fiber Optics or Coaxial cables)

8. Consumer Equipment Issues

8.2 ATV Receiver Input/Output Characteristics

The purpose of this section is to describe and characterize the consumer television receiver interface(s) which are available for ATV service signals, both input and output. The interface(s) will describe functional, technical and physical characteristics.

8.2.1 RF Interface (Composite video+audio+ancillary signal)

Describe RF signal characteristics including modulation, bandwidth, channel requirements, etc.

8.2.2 Baseband Video Interface

Define technical specification of the ATV baseband video signal(s), where available.

8.2.3 Baseband Audio Interface

Define technical specification of the ATV baseband audio signal. Define also the available number of audio channels supported by the proposed ATV system.

8.2.4 Interfacing with Ancillary Signals

Define the technical, physical and functional requirements of all proposed ancillary signals (e.g., control, teletex, other data).

8.3 Compatibility with Existing NTSC Consumer Equipment

The purpose of this section is to describe the proposed method of compatibility with NTSC consumer equipment including receivers, tuners, CATV set top converters, etc.

8.3.1 RF Compatibility with NTSC Equipment

Describe RF level interconnection and compatibility of ATV with NTSC consumer equipment.

8.3.2 Baseband Video Compatibility

Describe the relationship of the ATV video baseband signal parameter values with respect to NTSC baseband video signal. This section should provide explanation whether the ATV and NTSC video signals have common baseband parameter values and how complex is the signal conversion or transcoding from ATV to NTSC.

8.3.3 Baseband Audio Compatibility

Describe the relationship of the ATV audio baseband signal parameter values with respect to NTSC baseband video signal. This section should provide explanation whether the ATV and NTSC audio signals have common baseband specifications and how much better the ATV sound provisioning is.

9. Other Considerations

This section is to be used to cover all items that do not fall under one of the previous categories.

9.1 Practicality of Near-Term Technological Implementation

Is the technology required to implement the proposed system available or if it requires extensive further development, what is the anticipated time required?

9.2 Long-Term Viability/Rate of Obsolesence

Indicate the anticipated life of the proposed system. Indicate the changes in technology which may obsolete this system.

9.3 Upgradability/extendability

Can the proposed system be improved without obsoleting then existing hardware, and if so, how?

9.4 Studio/Plant Compatibility

Describe the extent to which the proposed system is compatible with current broadcast studios and other facilities.

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PSWP1 & WP2-079

TO: M.Richer, Chairman - SS Working Party 2 (SS/WP2)
FM: R. McMann, Chairman - PS Working Party 1 (PS/WP1)
DT: 26 November 1990
RE: Recent Modifications to ACATS Attributes List

PS/WP1 (Working Party on ATS Technology Attributes and Assessments) and PS/WP2 (Working Party on ATS Testing and Evaluation Specification) were reconvened at the request of the Planning Subcommittee Chairman to address various issues, as follows:

1) the need to supplement the testing of audio channels in the digital domain and objective testing of audio channels in the analog domain by subjective assessment;

2) testing of image dynamic resolution;

3) testing of compatible systems;

4) use of Show-scan material;

5) test method for EDTV into IDTV receivers;

6) use of pre-enhanced material for testing;

7) consider deleting the chroma resolution requirement in Section 6.2; and

8) source signal processing.

The Committee addressed these items in three meetings held on 29 May, 6 July, and 8 October 1990.

The members have agreed on certain changes to the Attributes Matrix. These changes were forwarded as a part of the minutes of the meetings, copies of which were sent to you.

The Attribute Matrix document has now been revised and a copy of the revised matrix is attached (reference PSWP1&2-078). The differences between the current revision and the prior one are marked "(rev.2)" and are as follows:

The members have agreed that testing of the audio channels in the digital domain and objective testing in the analog domain provides important and useful information about bit

rate errors, system robustness, and the characteristics of the system. However, these tests are not sufficient to determine system performance and must be supplemented by **subjective assessment** during the ATTC laboratory tests **by an expert panel.** The Committee, therefore, added to the attributes list in section II," **3.14 Subjective Assessment by an expert panel."**

In response to a report that SS/WP4 Task Force on Priorities had raised the question of defining a minimum audio service, the members agreed that there should be no change to the present statement that the minimum service is that provided within current NTSC practices namely a stereo audio pair and a SAP channel.

The members did agree to add to the list under II, 3.11, Audio Security, a request for information about any scrambling techniques, as section **3.11.4 Scrambling Techniques.** The current section 3.11.4 would be renumbered as section 3.11.5.

The members considered the question of adding an attribute concerning response to "sudden cuts" and concluded that sections 3.9.4.7, 3.10.4.7, and 3.11.5.6 - "Any other artifacts" covered this item.

It was reported that SS/WP2 had decided that a dynamic zone plate test signal should be used to test dynamic resolution. The members concluded that the current attributes list sufficiently covers this item but noted that during objective testing there should be qualitative assessment of the effect on the image, as well as, quantitative assessment.

The members agreed that for the purpose of testing compatible systems, FCC Regulations, Part 73 should be applied as appropriate.

The members further agreed that Working Parties 1 and 2 should provided input to the Chair of SS/WP2 Task Force on Field Testing on the concerns the members have on that issue. The members agreed that there is a consensus within WP1&2 that while laboratory testing will produce much information on the performance characteristics of a system, that issues of multiple path and ATV/ATV interferences can only be tested in the field.

After discussion and consideration of the system testing requirements, the members reached consensus that a signal source of high spectral and temporal quality having no lag and exhibiting high quality MTF should be employed and that the Showscan system could provide such a source. The members recommended the use of 10 seconds, minimum of a such a source to provide a means of demonstrating growth potential and possibility of system adeptness to handle future high definition sources.

The members agreed that in the testing of any proponent system, sample IDTV receivers of the latest type should be included in the tests. The attributes list for Section II, 8. Consumer Equipment Issues was modified to include **8.3.4 IDTV Receiver Compatibility.** IDTV and standard NTSC receivers should be observed for performance with and without

line and/or frame comb filtering.

The members discussed what was meant by the term "enhancement" and agreed that adjusting camera response to being essentially flat is not considered enhancement. The members agreed that "non-enhanced" materials should be used and that all materials should be "normalized". Normalization means that camera generated images should be made to match as closely as possible electronically generated images within the bandwidth limitations of the system and that adjustments to camera generated images should not produce overshoots of over 5% with a goal of a maximum of 2% being urged. Further, no images should be used for testing which have been noise cored.

In response to item 7) the members stated: "We recognize the difficulty of obtaining the MTF curves requested in attribute 2.2 without obtaining internal signals from proponent equipment. Because of the importance of this attribute, indirect methods may be employed to quantify chroma response." It was pointed out that the value to be measured is for the smallest object that can be reproduced in color.

Attribute **6.4 Susceptibility to Interference** was modified by adding the phrase **"on picture and sound."**

After discussion of item 8), the members agreed to modify the attributes list section **1.4 Artifacts** and to add the following:

> **1.4.1 The performance of ATV systems which have been spatially or temporally prefiltered including the use of motion detection.**
>
> **1.4.2 The performance of ATV systems in response to input signals having random noise, clock noise, etc. superimposed on them.**

Some members present raised concerns about the ability of the ATTC to test these attributes considering costs and time involved. The Working Party decided that it was inappropriate for it to make a decision on this question, that the decision belonged elsewhere.

There was a discussion on the appropriateness of Washington as the field test site and on the need to have more than one such test site. There was consensus to add two more attributes to the list in **Section 6.9 Transmission Field Testing** as follows:

> **6.9.1 At least one (1) location exhibiting average amount of difficulty, and**
>
> **6.9.2 At least one (1) location considered "difficult".**

It was reported that the field tests were designed to obtain data on system performance in response to multi-path delays, airplane flutter, weather conditions, and the like. The testing will also be directed to the UHF band. There are currently no plans to test in the low-band VHF spectrum. The broadcasters present believed that performance testing in both bands was an important issue.

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PSWP1 & WP2-080

TO: J. Flaherty, Chairman - Planning Subcommittee (PS)
FM: R. McMann, Chairman - PS Working Party 1 (PS/WP1)
DT: 30 November 1990
RE: Chairman's Report for ACATS Interim Report #4 from PS/WP1 and PS/WP2.

PS/WP1 (Working Party on ATS Technology Attributes and Assessments) and PS/WP2 (Working Party on ATS Testing and Evaluation Specification) were reconvened at the request of the Planning Subcommittee Chairman.

You should note that this report covers the activities of both PS/WP1 and PS/WP2, as the two committees met jointly throughout this reporting period.

PS/WP1 and PS/WP2 were reconvened to address the following:

1) the need to supplement the testing of audio channels in the digital domain and objective testing of audio channels in the analog domain by subjective assessment;

2) testing of image dynamic resolution;

3) testing of compatible systems;

4) use of Show-scan material;

5) test method for EDTV into IDTV receivers;

6) use of pre-enhanced material for testing;

7) consider deleting the chroma resolution requirement in Section 6.2; and

8) source signal processing.

Meetings were held on 29 May, 6 July and 8 October 1990. Minutes of the meetings along with supporting documents are attached.

During the meeting of 29 May 1990, the Committee agreed to, henceforth, meet jointly and work in concert. The Committee also addressed items 1) through 6) above.

After a short discussion, the members agreed that testing of the audio channels in the digital

domain and objective testing in the analog domain provides important and useful information about bit rate errors, system robustness, and the characteristics of the system. However, these tests are not sufficient to determine system performance and must be supplemented by **subjective assessment** during the ATTC laboratory tests **by an expert panel.** The Committee, therefore, added to the attributes list in section II," **3.14 Subjective Assessment by an expert panel."**

In response to a report that SS/WP4 Task Force on Priorities had raised the question of defining a minimum audio service, the members agreed that there should be no change to the present statement that the minimum service is that provided within current NTSC practices namely a stereo audio pair and a SAP channel.

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The members considered the question of adding an attribute concerning response to "sudden cuts" and concluded that sections 3.9.4.7, 3.10.4.7, and 3.11.5.6 - "Any other artifacts" covered this item.

It was reported that SS/WP2 had decided that a dynamic zone plate test signal should be used to test dynamic resolution. The members concluded that the current attributes list sufficiently covers this item but noted that during objective testing there should be qualitative assessment of the effect on the image, as well as, quantitative assessment.

The members agreed that for the purpose of testing compatible systems, FCC Regulations, Part 73 should be applied as appropriate.

The members further agreed that Working Parties 1 and 2 should provided input to the Chair of SS/WP2 Task Force on Field Testing on the concerns the members have on that issue. The members agreed that there is a consensus within WP1&2 that while laboratory testing will produce much information on the performance characteristics of a system, that issues of multiple path and ATV/ATV interferences can only be tested in the field.

After discussion and consideration of the system testing requirements, the members reached consensus that a signal source of high spectral and temporal quality having no lag and exhibiting high quality MTF should be employed and that the Showscan system could provide such a source. The members recommended the use of 10 seconds, minimum of a such a source to provide a means of demonstrating growth potential and possibility of system adeptness to handle future high definition sources.

The members agreed that in the testing of any proponent system, sample IDTV receivers of the latest type should be included in the tests. The attributes list for Section II, 8. Consumer Equipment Issues was modified to include **8.3.4 IDTV Receiver Compatibility.**

IDTV and standard NTSC receivers should be observed for performance with and without line and/or frame comb filtering.

The members discussed what was meant by the term "enhancement" and agreed that adjusting camera response to being essentially flat is not considered enhancement. The members agreed that "non-enhanced" materials should be used and that all materials should be "normalized". Normalization means that camera generated images should be made to match as closely as possible electronically generated images within the bandwidth limitations of the system and that adjustments to camera generated images should not produce overshoots of over 5% with a goal of a maximum of 2% being urged. Further, no images should be used for testing which have been noise cored.

During the meeting of 6 July 1990, the Committee addressed item 7) above.

In response to item 7) the members stated: "We recognize the difficulty of obtaining the MTF curves requested in attribute 2.2 without obtaining internal signals from proponent equipment. Because of the importance of this attribute, indirect methods may be employed to quantify chroma response." It was pointed out that the value to be measured is for the smallest object that can be reproduced in color.

Attribute **6.4 Susceptibility to Interference** was modified by adding the phrase **"on picture and sound."**

During the meeting of 8 October 1990, the Committee addressed item 8) above.

After discussion of item 8), the members agreed to modify the attributes list section **1.4 Artifacts** and to add the following:

> **1.4.1 The performance of ATV systems which have been spatially or temporally prefiltered including the use of motion detection.**
>
> **1.4.2 The performance of ATV systems in response to input signals having random noise, clock noise, etc. superimposed on them.**

Some members present raised concerns about the ability of the ATTC to test these attributes considering costs and time involved. The Working Party decided that it was inappropriate for it to make a decision on this question, that the decision belonged elsewhere.

There was a discussion on the appropriateness of Washington as the field test site and on the need to have more than one such test site. There was consensus to add two more attributes to the list in **Section 6.9 Transmission Field Testing** as follows:

6.9.1 At least one (1) location exhibiting average amount of difficulty, and

6.9.2 At least one (1) location considered "difficult".

J.Kean was assigned the task of liaising with ATTC to provide specific descriptions on how each of the attributes would be tested.

It was reported that the field tests were designed to obtain data on system performance in response to multi-path delays, airplane flutter, weather conditions, and the like. The testing will also be directed to the UHF band. There are currently no plans to test in the low-band VHF spectrum. The broadcasters present believed that performance testing in both bands was an important issue.

PS/WP1&WP2-081

29 Nov 90

FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE [ATS]
PLANNING SUBCOMMITTEE
WORKING PARTY 1 [PS/WP1]
ON ATS TECHNOLOGY ATTRIBUTES AND ASSESSMENTS
AND WORKING PARTY 2 [PS/WP1]
ON ATS TEST PLANNING

List of Participants

Ren McMann, Chairman PS/WP1
Stan Baron, Vice-Chairman PS/WP1
Max Berry
Joseph Flaherty, Chairman, PS
Hugo Gaggioni
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Bronwyn Jones
Jack Kean
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PS/WP-3-

FOURTH INTERIM REPORT OF THE SPECTRUM UTILIZATION AND ALTERNATIVES WORKING PARTY of the PLANNING SUBCOMMITTEE of the ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE

March 7, 1991

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I. EXECUTIVE SUMMARY

This document constitutes the Fourth Interim Report of the Spectrum Utilization and Alternatives Working Party (Working Party 3) of the Planning Subcommittee of the Federal Communications Commission's Advisory Committee on Advanced Television Service. As described in more detail in its three earlier reports, Working Party 3 (PS/WP-3) was given primary responsibility of providing the Planning Subcommittee and, ultimately via the Advisory Committee, the FCC with advice concerning spectrum utilization and alternatives as related to the Advanced Television Service (ATS). During this reporting period, four of PS/WP-3's specialist groups made major progress in their assigned work.

Specialist Group 3, which deals with issues surrounding broadcast support spectrum, made progress in four principal areas. First, it identified a number of critical issues associated with the need for additional non-broadcast spectrum to support the deployment of a terrestrial ATV broadcast service. One particularly significant issue that it identified was the importance of the definition of "simulcasting." This definition will have a profound effect on the requirements of non-broadcast support spectrum. A clear understanding is needed before concrete plans are established. Second, the specialist group initiated a letter to the ATV proponents to solicit their comments regarding the possible impact of their proposed systems on contribution and distribution systems used by the television broadcast community. Third, the specialist group undertook a study of the impact of ATV broadcast support spectrum in the State of North Carolina. North Carolina was chosen in order to gather information of the possible impact in smaller markets. The study concluded that, while each broadcaster in North Carolina could be provided with an additional STL channel to carry the ATV signal, it would probably require the installation of higher performance (e.g., more directive) antennas. Fourth, and finally, Specialist Group 3 reviewed possible new spectrum for ATV broadcast support services.

During the next reporting period, Specialist Group 3 will (a) analyze the responses received from the proponents regarding carriage of their particular ATV signals on microwave and other types of contribution and distribution circuits, (b) based on this analysis, survey existing manufacturers of contribution and distribution equipment regarding issues associated with the transmission of ATV signals on their systems, and (c) continue to further narrow the set of recommendations in the area for which it is responsible.

Specialist Groups 6 and 7, which deal with spectrum analysis and taboos, respectively, continued their efforts to analyze the broadcast spectrum requirements for ATV systems. Considerable progress was made toward the ultimate objective of determining spectrum availability, including taking into