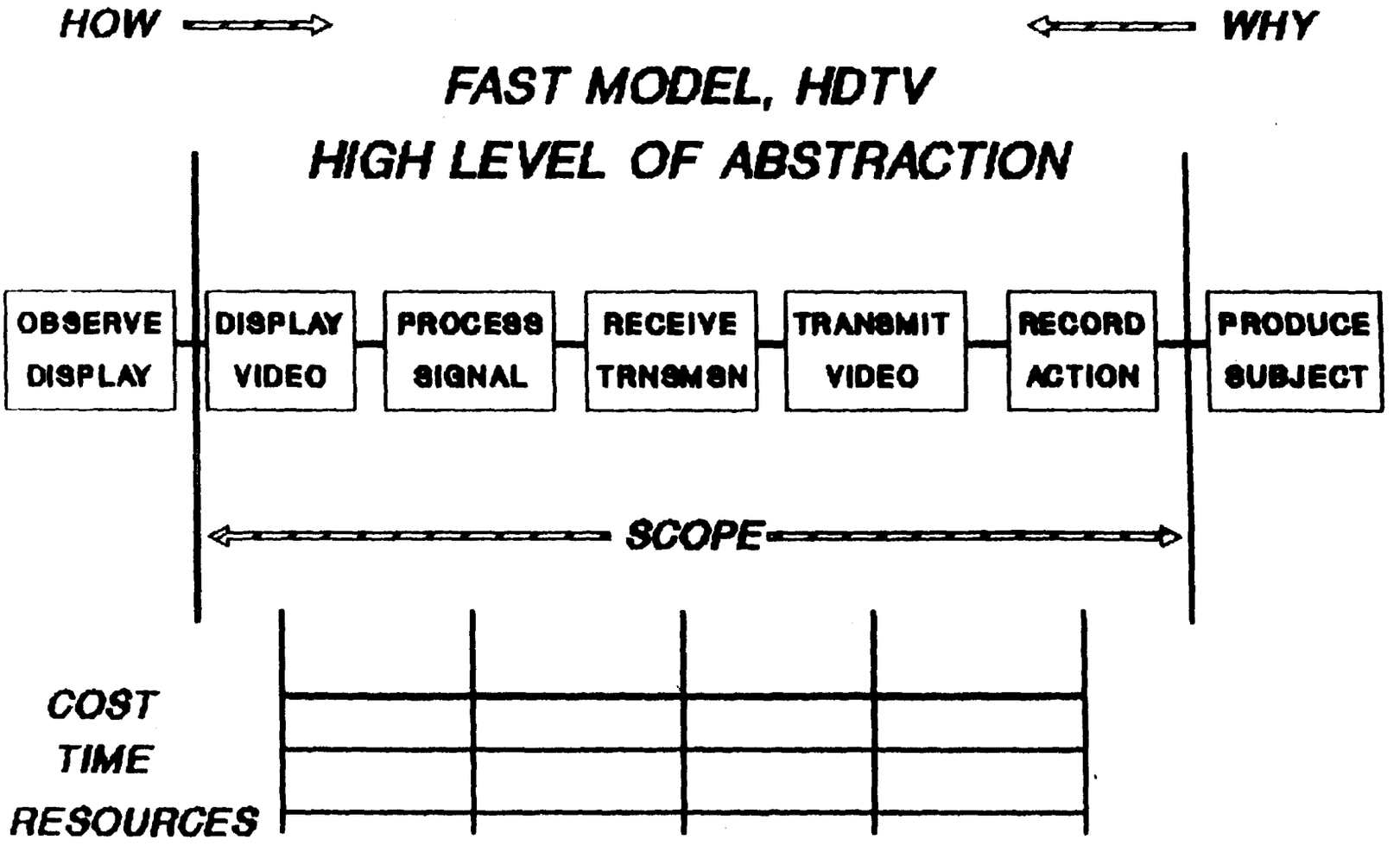

HOW
WHY
FAST MODEL, HDTV
HIGH LEVEL OF ABSTRACTION
OBSERVE DISPLAY
DISPLAY VIDEO
PROCESS SIGNAL
RECEIVE TRNSMSN
TRANSMIT VIDEO
RECORD ACTION
PRODUCE SUBJECT
SCOPE
COST
TIME
RESOURCES

WORKSHOP PREPARATION

- o WHAT IS THE PROBLEM WE ARE HERE TO DISCUSS
- o WHY IS THIS A PROBLEM?
- O WHY DOES IT HAVE TO BE SOLVED?

WORKSHOP OBJECTIVE

- o DEV BASELINE FUNCTION MODEL OF A GENERIC HDTV
- o DEV COMPARATIVE EVALUATION RANKING OF CANDIDATE STANDARDS AGAINST EACH FUNCTION OF THE BASELINE MODEL
- o PREPARE A REPORT OF FINDING AND RECOMMEND FOLLOW-ON ACTION

DRAFT

SS/WP4-30
June 14 1990

FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE

SYSTEMS SUBCOMMITTEE

WORKING PARTY ON SYSTEMS STANDARDS (SS/WP4)

TASK FORCE ON DATA FORMAT

PRELIMINARY REPORT ON DATA PRIORITIZATION

The Task Force on Data Format has met twice (May 1st and May 30th 1990) with the objective of reaching some preliminary conclusions in the classification and relative weighting of the Systems Attributes, described in document PS/WP1-054 (Attributes/Systems Matrix, Revision 1, September 20, 1989).

The current members of the Task Force are:

- Benjamin E. Crutchfield — Advanced Television Test Center.
- Alan S. Godber — NBC
- Hugo P. Gaggioni — Sony Advanced Systems (Chair)
- Robert N. Hurst — GE Government Services
- Brian James — Cable Labs

- Robert Lawrence — Nynex
- Richard Solomon — MIT
- Tony Uyttendaele — Capital Cities/ABC
- Robert E. Wohlford — Ameritech Services

During the process of prioritization of the Attributes List, some members of the group felt that it was premature to assign conclusive relative weights to the various tests and resulting data. The group agreed that this preliminary classification might be revisited at a later time as more information about the performance of the proponent systems is accumulated through the various tests.

A first categorization of the Attributes List consists in separating tests and characteristics into those that correspond mostly to Simulcast Systems and those that correspond to Compatible NTSC Systems. The attributes of these individual classes will be further classified into groups with varying degrees of relative importance. For example, "Group A" consisting of important or fundamental system attributes, and "Group B" with less important characteristics. In turn, these groups contain a further level of classification by assigning a minus sign to those tests of slightly less significance within the same group.

The group realized that a significant number of questions in the Attributes List could be answered by simply refering to the technical information submitted to SS/WP1 by the proponent system.

What follows is a preliminary classification of the Attributes List and a description of those issues to be included as part of the system's documentation.

Two classes of ATV systems: Simulcast and Compatible NTSC systems.

Simulcast Approach
(numbers refer to original document designation).

Group A (Important Characteristics).

A+ Classification.

Under "ATV Image Issues":

1.1 Luminance Spatial/Temporal Resolution (excluding item 1.1.7; see documentation section)

1.2 Chrominance Spatial/Temporal Resolution (excluding item 1.2.7; see documentation section)

1.3.2 Transfer Characteristics
1.4 Image Artifacts
1.8 Subjective Assessment of Overall Picture Quality

Under "ATV Audio Issues":

3.3 Signal-to-Noise Ratio (per Channel; in dBs)
3.5 Channel Crosstalk (dB); Audio/Audio, Video/Audio and Audio/Video
3.6 Audio Delay (Audio/Video and Audio to Audio)
3.7 Dynamic Range (dB)

Under "Terrestrial Transmission Issues":

6.2 Noise Susceptibility (Video, Audio, and Sync)
6.3 Susceptibility to Multipath or Echo
6.4 Susceptibility to Interference

Items 6.5 and 6.6 (susceptibility to group delay errors and non-linear distortions) should be checked during Transmission Field Testing.

Item 6.9 (Transmission Field Testing) is a very important subject and should be considered as a separate procedure to be carried out after completion of laboratory testing.

6.10 Coverage Relative to NTSC
7.1 Suitability for Cable Distribution
7.2 Suitability for Satellite Distribution

The group requires some guidance from SS/WP4 in relation to item 7.2 since it can be interpreted in relation to a service that is outside the charter of SS/WP4.

A- Classification.

Under "ATV Image Issues":

1.5 Transient Response

Under "ATV Audio Issues":

3.4 Non-linear Distortion
3.8 Frequency Response
3.9.4 Artifacts produced by Noise Reduction
3.10.4 Artifacts produced by Companding/Compression
3.11.4 Artifacts produced by Scrambling techniques
3.13 Stereo Separation
3.14 ATV Audio Artifacts

Under "Ancillary Signals": (need to be specified further; i.e., audio, video, data)

5.1 Provisions for Ancillary Signals (question to the proponent)
5.3.3 Effects of Multi-level Coding, frequency, phase and group delay
5.3.4 Other Characteristics (e.g. effects of video coding on ancillary data)

Under "Terrestrial Transmission Issues":

6.11 Gracefulness of Degradation
6.13 Sync Recovery Time (it requires a better definition)
9.4 Studio/Plant Compatibility

B+ Classification.

6.14 Non-flat Transmission Frequency Response
9.1 Practicality of Near-term Technological Implementation
9.2 Long-term Viability/Rate of Obsolesence
9.3 Upgradability/Extendability

B- Classification.

1.6 Aspect Ratio (the group took this issue as a given)
2.8 Use of Underscan/Overscan (related to subjective studies)

Compatible NTSC Systems
(numbers refer to original document designation).

Group A

A+ Classification

2.1 Luminace Spatial/Temporal Resolution
2.2 Chrominance Spatial/Temporal Resolution
2.3 Colorimetry Transfer Characteristics

The group determined that effects of digital processing on the reproducibility of the system's color gamut should be investigated.

2.4 Image Artifacts
2.9 Subjective Assessment of Overall Picture Quality
2.11 Temporal and/or Spatial Prefiltering of NTSC Signals

Under "Compatible NTSC Audio Issues":

4. Degradation of Compatible NTSC Audio (MTS)

Under "Terrestrial Transmission Issues":

6.2 Noise Susceptibility (Audio, and Video)
6.3 Susceptibility to Multipath or Echo
6.4 Susceptibility to Interference

Items 6.5 and 6.6 (susceptibility to group delay errors and non-linear distortions) should be checked during Transmission Field Testing.

Item 6.9 (Transmission Field Testing) is a very important subject and should be considered as a separate procedure to be carried out after completion of laboratory testing.

6.10 Coverage Relative to NTSC

Under "Suitability for Alternate Media Distribution":

7.1 Suitability for Cable Distribution
7.2 Suitability for Satellite Distribution

A- Classification

2.6 Transient Response
2.10.4 Performance Characteristics
5.1 Provision for Ancillary Signals
5.2 Lines Available for Ancillary Signals in Compatible NTSC Signal
5.3.3 Effects of Multi-level Coding, Frequency, Phase and Group Delay
5.3.4 Other Characteristics (Effects of of Video Coding on Ancillary data)

6.11 Gracefulness of Degradation
6.13 Sync Recovery (a better definition is needed)
9.4 Studio/Plant Compatibility

B+ Classification

6.14 Non-flat Transmission Frequency Response
7.3 Suitability for Other Terrestrial Distribution Systems
7.4 Transmission Security

9.1 Practicality of Near-term Technological Implementation
9.2 Long-term Viability/Rate of Obsolesence
9.3 Upgradability/Extendability

B· Classification

2.7 Aspect Ratio (the group took this issue as a given)
2.8 Use of Underscan/Overscan (related to subjective studies)

Systems Documentation

The following is the list of questions/parameters whose answers/descriptions should be found in the technical documentation provided by the system proponent:

1.7	Baseband Video Bandwidth
2.10.1,2,3	Questions on Ghost Cancelling
3.1	Number of Audio Channels
3.2	Modulation Scheme
3.9.1,2,3	Noise Reduction
3.10.1 - 4	Companding/Compression
3.10.1,2,3	Audio Security
3.12	Encoded Audio Baseband and RF Spectrum
5.3	Ancillary Signals (Error Rate and Distribution)
6.1	Characteristics of Compatibility
6.7	Transmitter/Antenna Requirements

7.2, 7.3 Suitability for Satellite distribution and other Terrestrial distribution systems:

The group concluded that depending on the system approach these issues might be outside the charter of SS/WP4

7.4 Transmission Security

8.1 Complexity of Receivers:
The group concluded that this was the perview of SS/WP3.

8.2 Receiver Input/Output Characteristics: not in the charter of SS/WP4
8.3 Compatibility with existing NTSC Consumer equipment:

The group concluded that in the case of compatible NTSC systems this issue was a given.

8.4 Allows Multi-Standard Display Devices

The group has not had the opportunity to study methods for the reduction and presentation of the test data. It is expected that the group will be able to make recommendations on these issues during our next meeting.

The next meeting of the Task Force on Data Format has been sheduled for July 2 1990, at 10.00 a.m. at the Sony offices in New York City.

Hugo Gaggioni

Chairman
SS/WP4 - Task Force on Data Format

BERNARD J. LECHNER
98 Carson Road
Princeton, New Jersey 08540
(609) 924-7545

SS/WP4-0031
14 JUN 1990

May 20, 1990

Robert S. Hopkins
Executive Director
Advanced Television Systems Committee
1776 K Street, NW, Suite 300
Washington, D.C. 20006

Dear Bob:

I am writing to you concerning SS/WP4. Unfortunately I will be in Europe during the month of June and will not be able to attend your next meeting on June 14, 1990.

In reviewing the minutes of the April 19, 1990 meeting, I find them to be excellent as usual. However, I note that in the list of attendees, my affiliation is listed as Consultant/David Sarnoff, which is incorrect. Norm Hurst represented DSRC that day, and I attended on behalf of Cable Labs. In fact, it was I who volunteered Cable Labs participation on the two task forces you created at the meeting.

With regard to the Task Force on Data Format, chaired by Hugo Gaggioni, my recollection of the charter for the Task Force is precisely consistent with the description given in the minutes of the April 19, 1990 meeting. I was therefore somewhat surprised when Hugo Gaggioni, in giving a report on SS/WP4 activities at the SMPTE Working Group on Advanced Television Production (WGATP) Meeting in Los Angeles on May 17, 1990, stated that the charter of the Task Force on Data Reduction included prioritizing the attributes and developing weighting factors.

Although Lex Felker brought up both of these issues in his introductory remarks, no mechanisms for prioritization or development of weighting factors were agreed in the meeting, and the task was certainly not assigned to the Task Force on Data Format. In light of the extensive discussions of these issues by SS/WP4 at the January 17, 1989 and April 11, 1989 meetings, if priorities and weighting factors are to be assigned, this must be done by SS/WP4 as a whole, consistent with the point of agreement reached at the January 17, 1989 meeting.

I hope that you can speak to Hugo prior to the June 14, 1990 meeting and clarify the charter of the Task Force on Data Reduction.

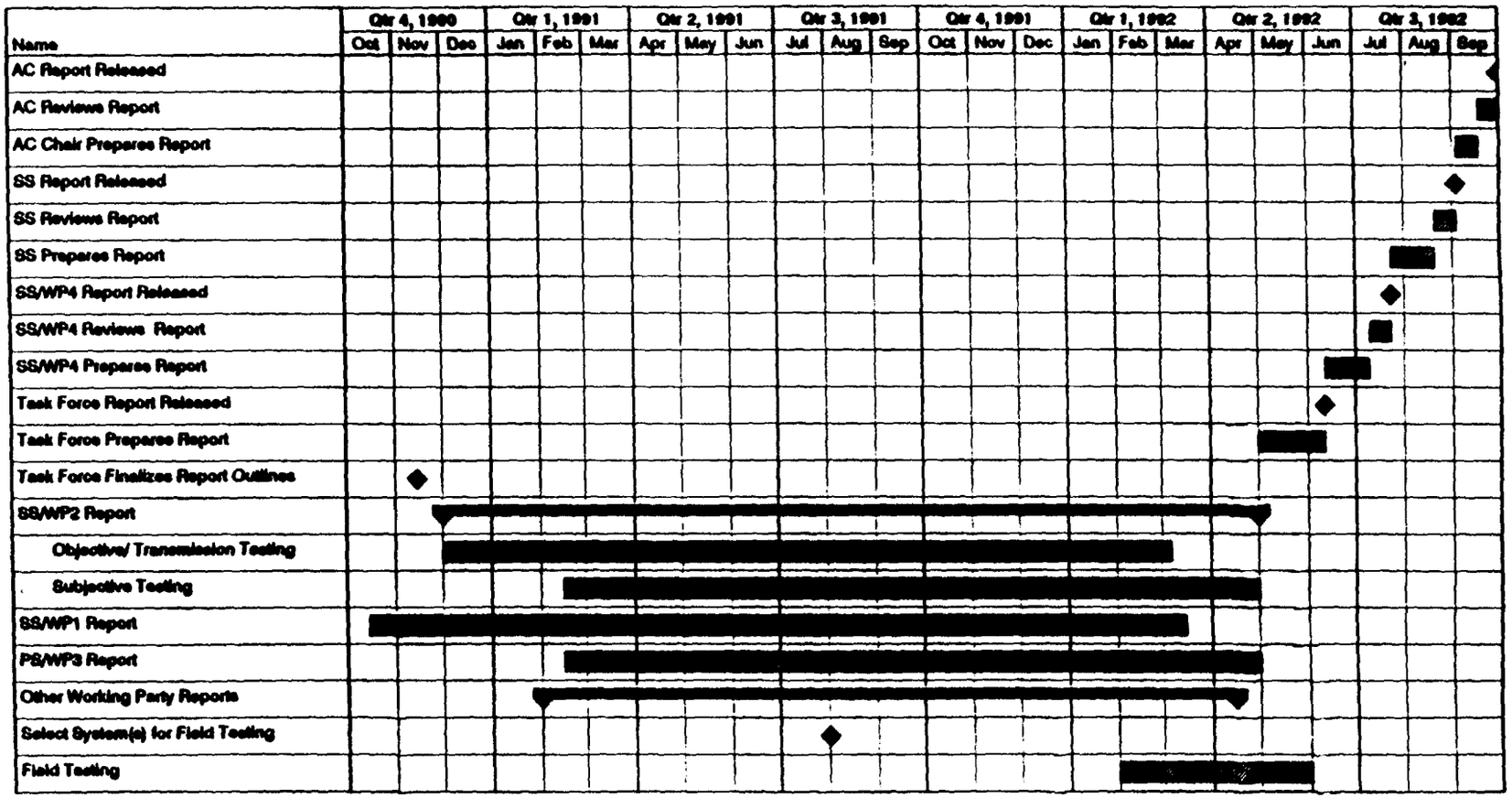
Sincerely yours,

Bernard J. Lechner

Bernard J. Lechner

FCC Advisory Committee on Advanced Television Service
Project Schedule

SS/WP4-0032
9 Sept 1990



Unofficial Draft

SS/WP4-0033
14 June 1990

FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE
SYSTEMS SUBCOMMITTEE
WORKING PARTY ON SYSTEM STANDARDS (SS/WP4)

MINUTES OF THE SIXTH MEETING
14 JUNE 1990

I. Minutes of the Meeting

1.0 Introduction and Approval of Agenda

The sixth meeting of SS/WP4 was held on Thursday, 14 June 1990 in the offices of CBS, 524 W 57th Street, New York, NY. The meeting was called to order by the Chair, Dr. Robert Hopkins, at 10:20 am. The proposed agenda was approved without comment.

2.0 Minutes of Fifth Meeting

A letter from Mr. Bernard Lechner was read and distributed (SS/WP-0030). The letter stated that Mr. Lechner was representing Cable Labs at the fifth meeting rather than DSRC as indicated in the minutes. Mr. Lechner's letter further stated that the minutes of the Fifth Meeting regarding the Task Force on Data Format made no mention of prioritizing or weighting of attributes and that he recalled no such charge to the Task Force.

Comments were solicited on this point by Dr. Hopkins just prior to the opening of the meeting. Mr. Nicholls of CBS produced his personal notes of the previous meeting. Discussion followed with general agreement that these notes accurately reflected the events. There was agreement to add the following abstract from those notes to minutes of the Fifth Meeting:

> Data reduction may include relative levels of importance of the data. Dr. Hopkins said the group should also try a first cut at priorities. Some members believed that SS/WP4 should decide on criteria before the testing begins. It was suggested that a strawman could be set up by the Task Force.

Mr. Sidran commented that any categories developed should be tied to specific action. He asked for clarification on the proper title for Mr. Gaggioni's Task Force since

different titles had been used from time to time. The title is Task Force on Data Format.

Dr. Hopkins noted that section 2.0 of the minutes was missing. This section should state:

> Dr. Hopkins explained that the minutes of the Fourth Meeting held on 27 November 1989 had been previously approved by correspondence but he would take into account any new comments from the group. There being no comments, the minutes of the fourth meeting were approved.

Dr. Hopkins approved the Minutes of the Fifth Meeting as modified by the above statements upon conclusion of the discussion.

3.0 Discussion of Value Engineering Methods

Mr. Donahue of Thomson reported the conclusions drawn by he and Mr. Hanover of EIA regarding the desirability of engaging the services of Kaufman Associates to guide the application of Value Engineering techniques to system selection. The costs would be a $7,000 initiation fee and $135/day/person for eight to ten people. Mr. Coletta proposed three days for the initial effort.

The membership agreed with Mr. Donahue's proposal to keep the subject on the table but not to engage Mr. Coletta's services at the present time.

4.0 Decision Methods

Mr. Donahue asked Mr. Mock of EIA how the Television Stereo decision was reached. Mr. Mock and Ms. Jones of Cable Labs said that industry segments were assigned various numbers of votes. Tapes, test results and documentation were available for review for six weeks. A marathon presentation of various proposals was held. Each industry segment caucused with a vote following. The adoption was made unanimous by a second round of voting.

The chair posed the following question:

> Does the group believe that:
> a. A general decision method must be written down?
> b. The method must be selected prior to commencing testing?

There was general agreement that a method should be written down. There were concerns expressed on both sides. If the method is too specific it may change significantly after testing of some systems is complete which could be questioned. If no process is defined until some or all systems are tested, some proponents may feel they did not have sufficient information in advance of testing.

In response to questions about our process of recommendation and whether it would take the form of a standard, the chair outlined the process. SS/WP4 will make a recommendation to Systems Subcommittee. Upon their review and approval the recommendation would pass to the Advisory Committee and, in like manner, to the FCC. SS/WP4 will not attempt to write a standard. The writing of the standard would follow acceptance of the recommendation and would be written by an industry group which ordinarily develops such standards. Reference was made to a Point of Agreement regarding standards writing from 11 April 1989; "SS/WP4 will not document a standard in the manner of SMPTE or EIA, rather its role is to recommend a standard documented by others."

The chair proposed a task force to develop a procedure for reaching a decision on the recommendation. [During the meeting this task force was referred to as the Task Force on the Decision Method. Subsequent to the meeting following discussion with the Chairman of the Advisory Committee, the name was changed to be the Task Force on the Recommendation Method.] There was agreement to the following:

> The Task Force on the Recommendation Method will be established with the charter-
>
> > to propose a recommendation procedure to the working party for use by SS/WP4 in selecting the recommended system.
>
> The chair is free to appoint the chairman of this task force. [Subsequently, Ron Gnidziejko, NBC, was appointed chair of the task force.]

The following organizations volunteered to serve on the task force: HBO, CBS, EIA, Thompson, Zenith, Bellcore, NBC, Cable Labs, and Scientific Atlanta.

5.0 Report of Task Force on Data Format

Mr. Hugo Gaggioni, chairman of the task force, distributed a report (SS/WP4-0030). He reported two meetings of the task force to date. They approached the problem by dividing the attributes into groups mostly associated with either Simulcast or NTSC Compatible systems. Attributes for each were separated into two categories of impor-

tance designated A and B. Each of these were further subdivided into two categories designated A+,A- and B+, B-. The task force noted that many questions required only response from the proponent but not testing. The task force also noted that there were parameters which they thought very important which were not listed in the Attribute List. Mr. Eilers of Zenith suggested that much of the original Attribute List was not appropriate to Simulcast systems. He also expressed his opinion that many important parameters were not objectively measurable.

Mr. Fannon of ATTC said that the testing organizations will request a sign-off of the test plans by SS/WP4 and others before the end of July. There was discussion of how SS/WP4 could deal with cases where no data output on a particular parameter was planned or required by the attribute list. It was agreed that comments would be passed to SS/WP2 for their action regarding testing.

Mr. Eilers said that a method for determining coverage area for the proposed systems, such as Grade B contours, was not defined. The Task Force on Data Format was charged to determine how to relate coverage area to the measured system parameters.

Mr. Gaggioni said the next meeting was scheduled for July 2. The output expected is a) a complete list of evaluation parameters thought to be important but which are not in the Attribute List and b) a list of who will do the data reduction and the form of the output. Mr. Fannon said computerized data collection will be set in August. Information on data format available before that time could be incorporated.

6.0 Report of Task Force on Report Drafting

Mr. Sidran, the chairman, reported that two meetings of the task force had been held. A report was distributed (SS/WP4-0032) which included a proposed Outline (SS/WP4-0029) for the Final Report. Mr. Sidran expects the group to develop a data flow diagram showing the interaction of all parts of the Advisory Committee as it impacts the report. They will also propose who should write each section.

A schedule was presented in the report which will be modified to reflect recent information. This schedule will be presented at the next SS meeting. The chair said the schedule should reflect agreement with SS/WP2 and it was agreed he should have latitude to modify it as needed. The following point of agreement was adopted:

> SS/WP4 will make every effort to meet the FCC scheduled deadline of September 30, 1992 for the final report. The report may reflect work remaining such as field testing.

Dr. Hopkins requested comments on the Outline. There were none.

7.0 Certification for Field Testing

There was consensus last meeting that not every system will be field tested. The chair said the Task Force on the Recommendation Method should recommend our procedure for selecting systems for field test. The following point of agreement was adopted:

> SS/WP4 is prepared to accept the task of certification for field testing and requests authority for such certification from the Systems Subcommittee.

8.0 New Business

A question arose as to how SS/WP4 would approve the test plans (see section 5.0 above). It was agreed that The Task Force on Data Format would be responsible for responding to the testing organizations. The chair will distribute copies of the proposed response to the membership for any exceptions to be stated.

9.0 Next Meeting

The next meeting was scheduled for Friday, 10 August 1990, in Washington D.C.. Location to be announced.

The meeting was adjourned at 1:30 pm.

II. List of Attendees

Name	Organization	Telephone	Fax
Mr. Gerald Chouinard	CRC	613-998-2652	613-993-9950
Mr. Virgil Conanan	HBO	212-512-5309	212-512-5598
Ms. Fran Dix	Bellcore	201-758-2106	201-758-0199
Mr. Joe Donahue	Thomson	202-872-0670	202-872-0674
Mr. Carl Eilers	Zenith	708-391-8427	708-391-8555
Mr. Wilfred Fagot	NBC	212-664-4550	212-581-6687
Mr. Peter Fannon	ATTC	703-739-3850	703-739-3230
Mr. Hugo Gaggioni	Sony	201-833-5715	201-833-9455
Mr. David L. Hanna	Consultant/GTE	817-656-1933	
Dr. Robert Hopkins	ATSC	202-828-3130	202-828-3131
Mr. Robert Hurst	DSRC	609-486-5097	609-486-5226
Ms. Bronwen Jones	Consultant/Cable Labs	203-655-3881	203-655-6386
Mr. Tom Mock	EIA	202-457-4975	
Mr. William Nicholls	CBS	212-975-5646	212-975-1715
Mr. Gerald Robinson	Scientific Atlanta	404-925-5835	404-925-6372
Mr. Tim Schnucke	Fletcher, Heald & Hildreth	202-828-5700	
Mr. Bruce Sidran	Bellcore	201-758-4646	201-758-0199

III. Agenda

1. APPROVE AGENDA
2. CONSIDERATION OF MINUTES OF THE FIFTH MEETING
3. DISCUSSION OF VALUE MANAGEMENT METHODOLOGY
4. REPORT FROM THE TASK FORCE ON DATA FORMAT
5. REPORT FROM THE TASK FORCE ON REPORT DRAFTING
6. CONTINUE DISCUSSION OF "CERTIFICATION" FOR FIELD TESTING
7. NEW BUSINESS
8. ADJOURNMENT

IV. Summary of Open Action Items

Assigned	Action Expected for the Next Meeting
Dr. Hopkins	Appoint chairman of the Task Force on the Recommendation Method.
	Distribute copy of response to request for test plan approval and collect exceptions. Pass response to requesting organizations.
	Communicate the working party's request to the Systems Subcommittee for authority to certify systems for field testing.
Mr. Sidran	Hold meeting of Task Force on Report Drafting to propose who will write each report section.
	Prepare a data flow diagram.

Mr. Gaggioni	Hold meeting of Task Force on Data Format.
	Determine how to relate service area to test data.
	Write a response to the request for approval of test plans.
	Produce list of attributes not on current Attributes List.
	Produce list of groups responsible for each area of data reduction.

V. List of Documents distributed at the Meeting

SS/WP4-0029	First Draft of Final Report (Outline)
SS/WP4-0030	Preliminary Report of Task Force on Data Format
SS/WP4-0031	Letter of 20 May Bernard Lechner to Robert Hopkins
SS/WP4-0032	Preliminary Report of Task Force on Report Drafting

VI. List of Points of Agreement by the Members at the Sixth Meeting

The membership chooses not to engage a consultant for Value Engineering analysis at the present time. The option will remain on the table.

A Task Force on the Recommendation Method will be formed with the charter to propose a recommendation procedure to the working party for use in selecting the recommended system. The chair will appoint a task force chairman.

SS/WP4 will make every effort to meet the FCC scheduled deadline of September 30, 1992 for the final report. The report may reflect work remaining such as field testing.

SS/WP4 is prepared to accept the task of certification for field testing and requests authority for such certification from the Systems Subcommittee.

Test Factor \ System Proponent	Zenith	NHK	ATRC: Philips	MIT	DigiCipher
Luminance Resolution (Objective)					
Chrominance Resolution (Objective)					
Signal Bandwidth (Objective)					
Chrominance Dynamic Range (Objective)					
3-D Time-Domain Signature (Objective)					
Basic Received Quality					
Subjective Resolution					
Transient Response (Objective)					

A+

A-

Classification of Test Factors

Simulcast Approach: Image Issues

HPG 8/10/90

Test Factor \ System Proponent	Zenith	NHK	ATRC: Philips	MIT	DigiCipher
Signal-to-Noise Ratio (dB)					
Channel Crosstalk (dB)					
Audio Delay (Audio/Video and Audio/Audio)					
Dynamic Range (dB)					
Non-Linear Distortions					
Frequency Response					
Audio Artifacts					
Stereo Separation					

A+

A-

Classification of Test Factors
Simulcast Approach: Audio Issues

A+

A*-

Test Factor \ System Proponent	Zenith	NHK	ATRC: Philips	MIT	DigiCipher
Random Noise					
Multipath					
Microreflections					
Intermodulation					
Impulse Noise					
Hum and L.F. Noise					
Airplane Flutter					
Co-Channel (from ATV, NTSC)					
Adj. Channel (from ATV, NTSC)					
U.H.F Taboos (from ATV, NTSC)					

Classification of Test Factors

* : Gracefulness of Degradation

Simulcast Approach: Terrestrial Transmission Issues

HPG 8/10/90

Test Factor \ System Proponent	ATRC: ACTV	Faroudja
Luminance Resolution (Objective)		
Chrominance Resolution (Objective)		
Signal Bandwidth (Objective)		
Chrominance Dynamic Range (Objective)		
3-D Time-Domain Signature (Objective)		
Basic Received Quality; Image Artifacts		
Subjective Resolution		
Transient Response (Objective)		

A+ ↕ A-

Classification of Test Factors

Compatible NTSC Approach: Image Issues

Test Factor \ System Proponent	ATRC: ACTV	Faroudja
Signal-to-Noise Ratio (dB)		
Channel Crosstalk (dB)		
Audio Delay (Audio/Video and Audio/Audio)		
Dynamic Range (dB)		
Degradation of Compatible NTSC Audio		
Non-Linear Distortions		
Frequency Response		
Audio Artifacts		
Stereo Separation		

A+

A-

Classification of Test Factors

Compatible NTSC Approach: Audio Issues