

Incidental Carrier Phase Modulation

Test Date: _____ ATV Carrier Freq.: _____ ATV System: _____

Video Tape Number: _____ Time Code: _____ Test Engineer: _____

Test Data Accepted By: _____

Expert Observers

1: _____ 2: _____ 3: _____

4: _____ 5: _____

Interference Levels

Threshold of Visibility of Interference: _____ dBc

Point of Unusability: _____ dBc

Range Ratios 1: _____ 2: _____ 3: _____ 4: _____ 5: _____ 6: _____ 7: _____ dBc

Recording Levels 1: _____ 2: _____ 3: _____ 4: _____ 5: _____ 6: _____ 7: _____ 8: _____ dBc

Comments

CableLabs Test & Data Matrix

Cable Test Procedures

Time Line Cross Ref.	TEST ID	TYPE	Resource Utilization						Test Signals		Results				Notes
			FDLAR	CATB	HDD VTR	D2VTR	Supers	Display	S-suit, M-motion req T-test option	Numerical Tabular/Summed	Graph	Photo	Video		
	3. Intermod Dist Composite 2nd Order (CW)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	4 HD	Subj. rating to be done at ATEL	
	3. Intermod Dist Composite 2nd Order (NTSC)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	3. Intermod Dist. Composite 2nd Order (50/50)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	3. Intermod Dist. Composite 2nd Order (ATV)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	3. Intermod Dist. Composite 3rd Order (CW)	Rating	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	3. Intermod Dist. Composite 3rd Order (NTSC)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	3. Intermod Dist. Composite 3rd Order (50/50)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	3. Intermod Dist. Composite 3rd Order (ATV)	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	4. Multiple Micro-Reflection	Quality BO&C	--	X	1	--	5	ATV	T3 (flat field, dyn)	Quality	--	--	4 HD	Subj. rating to be done at ATEL	
	5. High Level Sweep Calan	BO&C	--	X	1	--	5	ATV	T3 (flat field, dyn)	BO & C	--	--	Archive		
	5. High Level Sweep Wavetek	BO&C	--	X	1	--	5	ATV	T3 (flat field, dyn)	BO & C	--	--	Archive		
	6. 60 Hz Hum Modulation	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		
	6. 120 HZ Hum Modulation	Range	--	X	1	--	5	ATV	T3 (flat field, dyn)	Range levels	--	--	Archive		

Cable Test Bed is used in all tests but is checked only where it is used to introduce impairment or interference.

Display: 24=24 NTSC Recrs; LS=Large Scrn NTSC; ATV=Hitachi

DRAFT

SS/WP4-0051
January 25, 1991

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

MINUTES OF THE NINTH MEETING

I. Minutes of the Meeting

1.0 Introduction and Approval of Agenda

The ninth meeting of SS/WP4 was held on January 25, 1991 at the National Association of Broadcasters in Washington D.C. The meeting was called to order by the chair, Dr Robert Hopkins at 10:10 am. Those attending introduced themselves. The proposed agenda was distributed. Item 3 of the agenda, The Report from the Task Force on Data Format, was deferred to allow for travel delay of the chairman of that task force.

2.0 Minutes of the Previous Meeting

The minutes of the eighth meeting will be distributed by mail along with other documents shortly after this meeting.

3.0 Report from the Task Force on Report Drafting

The task force report was presented by Dr. Hopkins for Mr Bruce Sidran. A letter from Mr. Sidran to Dr Hopkins (SS/WP4-0048, January 16, 1991), the Outline for the Final Report (SS/WP4-0029, January 22, 1991) and a diagram showing information flow within the advisory committee in regards to the final report (SS/WP4-0049) were distributed.

The letter was read by those present. This letter pointed out that large differences between systems are more significant than small differences and that areas where the systems vary greatly would be the more important measures of performance. The letter suggested that a decision method was implied by the organization of the outline and that the four groupings within the report --such as "Policy and Regulatory Issues" and "Spectrum Utilization" -- are in priority order, are independent of each other, and may be analyzed separately.

**Minutes of the Ninth Meeting of SS/WP4, cont.
25 January 1991
Page 2 of 8**

In the discussion which followed, there was general opinion that ranking the four categories in importance was not appropriate, at least at the present time. Some interdependence between these categories was also suggested. Several recommended that a section on the rationale for the recommendation be explicitly included in Chapter 9 or a separate chapter. This section would contain the comparative analysis. The notion of "large differences" simplifying the task and, in fact, leading to a definition and ranking of critical objectives found support.

Mr. Mark Richer monitored the discussion and prepared an outline for an iterative procedure which would begin with an initial set of critical objectives. Systems would be analyzed against the sense of what is needed regarding those critical objectives. The differences between systems in these areas would be compared and a refined list of critical objectives prepared. The process would be repeated until a basis for consensus had been reached. This approach had general support. Several voiced opinion that the proponents should have the opportunity to present their views during this process.

The Outline for the Final Report was reviewed. The group agreed that this should form the outline for the final report and should be included in the progress report. It was understood that the rationale for the recommendation would appear in Chapter 9 and that there would be expansion in the number of subsections. The primary sections are expected to remain relatively unchanged. A concern was expressed that section 7.4.2.1, "Gracefulness of Degradation", went beyond the detail of other sections. It was agreed that this section would be removed.

The Data Flow Diagram was reviewed and approved for inclusion in the progress report.

4.0 Report from the Task Force on Data Format

The report was presented by Mr. Hugo Gaggioni, chairman of the Task Force. A copy of the Status Report of the Task Force (SS/WP4-0050, January 25, 1991) was distributed. The last meeting was held on January 23, 1991 in New York. The status report included information provided by ATTC, CableLabs and CRC. The ATTC document was the Test & Data Matrix which shows tests to be performed, resources used, signals and reported results. The CableLabs documents contained sample data recording sheets. CRC presented a draft outline of a single system report, including a format for test results and similar documents regarding the overall report. Mr. Gaggioni said that he expected these to be valuable tools for coordination of test resources during the testing phase. A test and data matrix is expected from CableLabs in the near future.

Minutes of the Ninth Meeting of SS/WP4, cont.
25 January 1991
Page 3 of 8

Dr. Hopkins suggested that the matrix sheets from ATTC and the sample data recording sheets from ATTC, CableLabs, and CRC give the basic information which the task force sought. The working party members accepted the form of this information as suitable for use by SS/WP4. The working party agreed that these documents should be attached to the progress report. Dr. Hopkins said the task force should continue to work with the labs, commenting on the form of the data recording sheets.

5.0 Review of Progress Report

A draft of the progress report to be submitted for the Fourth Interim Report was distributed (SS/WP4-0052). The body of the report was reviewed section by section. No changes were thought necessary.

Based on discussion earlier in the meeting, section 7.4.2.1 of the Report Outline will be deleted. Similarly, the sentence relating to priority of issues was to be removed from the attachment to the outline along with a reference to a decision tree. Comments will be added explaining that the rationale for the recommendation will appear in the report.

An appendix is to be added containing a flow chart based on the discussion during the meeting outlining the process that the working party expects to follow in reaching consensus.

A copy of the revised report will be mailed to members for review when the report is submitted to Dr. Dorros next week. Comments should be prompt.

6.0 Next Meeting

The next meeting is planned in early to middle March, 1991. The members will be advised. The meeting was adjourned at 2:00 pm.

Minutes of the Ninth Meeting of SS/WP4, cont.
25 January 1991
Page 4 of 8

II. List of Attendees

Name	Organization	Telephone	Fax
Mr. Stan Baron	NBC	212-684-7557	212-684-8887
Mr. Robert Bromery	FCC	202-653-7315	202-653-8773
Mr. Lynn Claudy	NAB	202-428-5346	202-428-5343
Mr. Ben Crutchfield	ATTC	703-739-3850	703-739-3230
Ms. Carol Darling	ABSOC	613-238-5850	613-238-9241
Mr. Gregory DePriest	Toshiba	201-628-8000	201-628-1875
Mr. James G. Ennis	Fletcher Heald & Hildreth	202-828-5700	202-828-5786
Mr. Hugo Gaggioni	Sony	201-833-5715	201-833-9455
Ms. Ann Hagemann	HDTV International	703-548-1428	703-548-8068
Mr. David L. Hanna	Consultant/GTE	817-658-1933	
Dr. Robert Hopkins	ATSC	202-828-3130	202-828-3131
Mr. Brian James	Cable Labs	703-739-3870	202-739-5750
Mr. Robert Keeler	AT&T Bell Labs	202-949-7982	201-949-5775
Mr. Thomas Keller	Consultant/Cable Labs	203-567-3135	
Mr. Scott Keneman	DSRC	609-734-2760	609-734-2901
Mr. Jeffrey Krauss	General Instruments Corp.	301-258-8164	301-977-6330
Mr. Bernie Lechner	Consultant	609-924-7545	609-924-7547
Mr. Lawrence Lockwood	TeleResources	703-920-3795	
Dr. Yun-Foo Lum	CRC	613-990-4490	613-993-9950
Mr. Tom Mock	EIA	202-457-4975	
Ms. Marilyn Mohrman-Gillis	Assoc. of Public B'casting	202-887-1700	

Minutes of the Ninth Meeting of SS/WP4, cont.
25 January 1991
Page 5 of 8

Name	Organization	Telephone	Fax
Mr. Robert Rast	General Instrument	619-535-2532	619-535-2485
Mr. Mark Richer	PBS	703-739-5469	703-739-8938
Mr. Gerald Robinson	Scientific Atlanta	404-925-5835	404-925-6372
Mr. Alan Stillwell	FCC	202-653-8162	202-653-8773
Mr. Victor Tawil	MSTV	202-462-4351	202-462-5335

III. Agenda

1. **Approve Agenda**
2. **Discuss minutes of the eighth meeting**
3. **Report from the Task Force on Data Format**
4. **Report from the Task Force on Report Drafting**
5. **Approval of the Outline for the SS/WP4 Final Report**
6. **Discuss the submission for the Fourth Interim Report**
7. **Other Business**
8. **Adjournment**

IV. Summary of Open Action Items

Assigned

Action Expected

Mr. Gaggioni Continue to work with the labs regarding data recording sheets.

Mr. Sidran Continue to develop the final report.

V. List of Documents distributed at the Meeting

Minutes of the Ninth Meeting of SS/WP4, cont.

25 January 1991

Page 6 of 8

- SS/WP4-0029** Outline for the Final Report (revised 16 January 1991)
- SS/WP4-0048** Letter from Mr. Sidran to Dr. Hopkins, 16 January 1991
- SS/WP4-0049** Data flow diagram, 22 January 1991.
- SS/WP4-0050** Status Report from the Task Force on Data Format, 25 January 1991.
- SS/WP4-0052** Progress Report (to be submitted for the Fourth Interim Report)

VI. Historical List of Points of Agreement by the Members:

- 25 Oct 1990** The information and form proposed by the Planning Subcommittee/Working Party 3 in the document PS/WP3-0140 (SS/WP4-0045) seems to be acceptable for use by Systems Subcommittee/Working Party 4. However, some future additions may be requested by SS/WP4.
- 14 Jun 1990** The membership chooses not to engage a consultant for Value Engineering analysis at the present time. The option will remain on the table.
- 14 Jun 1990** 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. [Mr. Ron Gnidziejko subsequently appointed.]
- 14 Jun 1990** 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.
- 14 Jun 1990** SS/WP4 is prepared to accept the task of certification for field testing and requests authority for such certification from the Systems Subcommittee.
- 19 Apr 1990** Two new Task Forces will be formed. The Task Force on Data Format will be Chaired by Mr. Gaggioni. The Task Force on Report Drafting will be Chaired by Mr. Sidran.

Minutes of the Ninth Meeting of SS/WP4, cont.
25 January 1981
Page 7 of 8

12 Jul 1989 SS/WP4 will send document SS/WP4-0019, ATV System Models, to the Systems Subcommittee, the ATSC and the EIA. The following text is contained in that document:

SS/WP4 reaffirms its recognition of the importance of interoperability between alternative media and terrestrial broadcast standards, and the desirability for consumer ATV receivers to accommodate alternative media inputs.

SS/WP4 encourages the ATSC and the EIA to develop specifications for an appropriate interface that could lead to a voluntary industry standard

The input documents on ATV System Models will be forwarded to both the EIA and the ATSC. Figure 1 of document SS/WP4-0019 (also see document SS/WP4-0018) can serve as an ATV systems model. Figure 2 of document SS/WP4-0019 (see also document SS/WP4-0016) can serve as a model for an ATV receiver.

SS/WP4 will maintain liaison with the EIA and the ATSC on an ongoing regular basis.

11 Apr 1989 SS/WP4 intends to make recommendations based only on consensus. Determination of consensus will be left to the officers. For consensus to exist there must be substantial agreement among the members of the Working Party, and general agreement that consensus exists. If consensus does not exist, but there is a large body of opinion, it will be reported along with any minority opinions.

11 Apr 1989 The primary intention of SS/WP4 is to make a recommendation for the terrestrial broadcast of ATV.

11 Apr 1989 SS/WP4 does not anticipate making recommendations for transmission of ATV on alternative media, but does anticipate other organizations will do so. SS/WP4 will consider inputs from other organizations in its deliberations.

11 Apr 1989 The primary intention of SS/WP4 is to recommend a single standard for the terrestrial transmission of ATV.

Minutes of the Ninth Meeting of SS/WP4, cont.

25 January 1981

Page 8 of 8

- 11 Apr 1989 Whatever system is recommended for terrestrial broadcast must be capable of being carried by cable systems as well.
- 11 Apr 1989 SS/WP4 recognizes the importance of inter-operability between alternative media and terrestrial broadcast standards, and the desirability for consumer ATV receivers to accommodate alternative media inputs. However, it does not anticipate making recommendations in these areas, but does anticipate other organizations doing so. SS/WP4 will consider inputs from other organizations in its deliberations.
- 11 Apr 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.
- 17 Jan 1989 The Charter was amended to read: "The Working Party on System Standards shall recommend standards for the transmission of ATV based upon information supplied by any and all other Working Parties in the Advisory Committee."
- 17 Jan 1989 If it is deemed to be appropriate as part of the decision process to assign weights (or levels of importance) to various findings of the other Working Parties, SS/WP4 alone shall do so.

TEST SEQUENCE & CALENDAR
for Laboratory Testing of Advanced Television (ATV) Transmission Systems
by the Advanced Television Test Center & Cable Television Laboratories

ATV SYSTEM ACCESS PERIOD	INTERFACE CHECK	LABORATORY TEST PERIOD		ATV SYSTEM/ PROPONENT	SCANNING FORMAT (see item 3, below)
		START TESTING	END TESTING		
1991					
1	April 8	April 12	June 12	ACTV: Advanced Compatible Television David Saroff Research Center	525/59.94, 1:1
2	June 13	June 19	August 12	Narrow MUSE NHK/Japan Broadcasting Corporation	1125/60, 2:1
3	August 27	September 3	October 24	DigiCipher General Instrument Corporation	1050/59.94, 2:1
4	October 25	October 31	December 27	SC-HDTV: Spectrum Compatible HDTV* Zenith Electronics Corporation	787.5/59.94, 1:1
1992					
5	December 30	January 8	March 3	Analog Simulcast HDTV* N.A. Philips Consumer Electronics Co.	1050/59.94, 2:1
6	March 4	March 10	April 30	Channel Compatible HDTV Massachusetts Institute of Technology	787.5/59.94, 1:1

*Zenith and Philips/Advanced Television Research Consortium have announced that they will replace the analog systems listed here (and prioritized by SS/WP-1) with digital systems. Testing of the digital systems is subject to Pre- and Final Certification. (See notes 4, 5, 6, below.)

Notes:

- MOVE IN: Proponent permitted to begin moving certified ATV system's equipment into ATTC facility and setting up 10 working days prior to beginning INTERFACE CHECK: ATTC's electric power and HVAC systems will be in operation.
- INTERFACE CHECK: From this date, ATTC prepared to supply video, audio, and other specified signals to ATV system as previously agreed; each system permitted up to four working days prior to test start for proponent and ATTC/CableLabs to verify signal interface parameters.
- MOVE OUT: Proponent permitted up to five working days after end of testing to remove all of its equipment and belongings from ATTC facility. See "ATTC Test Administration Plan & Operations Manual" and related contract for full definitions, terms, and conditions.

This Test Sequence & Calendar is based on the following conditions:

1. Dates are final commitments from proponents for delivery of ATV systems. Upon withdrawal or merger of any of the scheduled ATV systems, those systems scheduled for subsequent slots may be advanced, upon reasonable notice, by one test slot (ATV System Access Period). The testing process and laboratories require a testing schedule that promises reasonably continuous use of laboratory facilities and avoids significant downtime between systems.
2. Each system must operate with the source signal Scanning Format previously committed to by its proponent to ATTC (listed above)--e.g. number of scanning lines/cycles per second, progressive (1:1) or interlaced (2:1). Official test material in these formats is to be produced, approved, and delivered to ATTC by the Advisory Committee sufficiently in advance of testing.
3. This schedule reflects a currently estimated 38 working days (for simulcast HDTV systems) and 43 working days (for enhanced NTSC systems) for ATTC and CableLabs to conduct the laboratory tests for broadcast and cable. It does not reflect: a) subjective rating tests (video and audio); b) field tests in the actual transmission environment; or c) retesting. Subjective rating tests are planned to be conducted off-line and at other facilities; they will start after video and audio tape records for a particular ATV system's rating tests have been completed at ATTC.
4. Each ATV system must be certified for testing by the Advisory Committee (SS/WP-1). A system's full technical documentation for Final Certification must be submitted by the proponent to SS/WP-1 ninety (90) days prior to the arrival of the system at ATTC (MOVE IN) for testing, and Final Certification must be completed by sixty (60) days prior to the arrival of the system at ATTC for testing. Final Certification through this Advisory Committee process is a prerequisite for a system's being tested by ATTC and CableLabs.

(Test Sequence & Calendar, continued - FCC Advisory Committee on Advanced Television Service)

5. No change is permitted in an ATV system after it has received Final Certification. The ATV system delivered to ATTC and CableLabs for testing must be the same as the system described to and given Final Certification by the Advisory Committee (SS/WP-1). No change to the system is permitted at the ATTC facility.
6. Each ATV system listed above has already received Preliminary Certification by the Advisory Committee (SS/WP-1). In the event any proponent makes, or contemplates making, a significant change in a pre-certified system, the proponent must notify the Advisory Committee, ATTC, and CableLabs by December 31, 1990. A new technical description of the system, highlighting and providing details of the change(s), must be submitted immediately to these parties, but in no event later than February 28, 1991. A "significant change" is one which:
1) may invalidate the Preliminary or Final Certification technical analysis conducted by SS/WP-1; 2) may affect the test procedures, facilities, signals, schedule, or any other aspect of the testing process; or, 3) may ultimately have an impact on the Advisory Committee's ability to evaluate proposed systems and make its recommendation to the FCC in a timely manner. Such a change will require that the system be pre-certified again and/or it may preclude laboratory testing by ATTC and CableLabs. In any event, all ATV systems scheduled now, or through this process must have been pre-certified no later than March 31, 1991. Also, proponents must notify the Advisory Committee, ATTC and CableLabs immediately of any significant change(s) to their systems after they have received Preliminary Certification and during the period leading up to Final Certification, as described in item 4, above.

* * *

1/8/91

IS - 0017
7 Mar 91

Implementation Subcommittee

Fourth Interim Report

to the

FCC Advisory Committee on Advanced Television Service

James J. Tietjen

Chairman, Implementation Subcommittee

IS - 0017
25 Feb 91
7 Mar 91

**Implementation Subcommittee
Fourth Interim Report
to the
FCC Advisory Committee on Advanced Television Service**

I. Introduction

The Implementation Subcommittee is comprised of two Working Parties which deal with issues related to policy and regulation and potential scenarios associated with making a transition from existing television service to an advanced television system (ATV). The objectives of Working Party 1 (Policy and Regulation) are to define and address policies and regulations germane to the implementation process in order to recommend appropriate FCC actions in overseeing the implementation of an ATV. The objectives of Working Party 2 (Transition Scenarios) are to analyze the transition process for various generic system concepts in order to evaluate their implementation requirements and to develop an implementation plan for the selected system.

II. Working Party 1 (Policy and Regulation)

The activities of IS/WP1 since the last interim report have focused on two items, alternative methods for assigning supplemental spectrum for ATV (Spectrum Assignment Options) and the Ashbacker issue. A report on Spectrum Assignment Options has been completed and is appended to this report (Attachment A) while the Ashbacker

issue is still under investigation although a report on this subject is expected in the near future.

In summary, the report on Spectrum Assignment Options examined those options discussed in the FCC's September 1988 Further Notice of Inquiry. These are:

- A) Some type of comparative process
- B) Lotteries
- C) Auctions
- D) Assigning capacity to all licensees uniformly and allowing stations to acquire needed additional capacity from others.

Because the ultimate suitability of specific assignment options in the ATV context depends on critical factors such as spectrum availability, coverage area limitations, timing constraints, and system specifications that have yet to be determined, IS/WP1 has limited itself to a neutral discussion of the pros and cons of these options. The Working Party believes that at this time recommendation of a specific option would be premature and intends to revisit these issues when computer studies related to spectrum allocation optimization and the system testing process reveal the extent to which licensees can be accommodated with additional spectrum assignments.

III. Working Party 2 (Transition Scenarios)

Early in the development of its work, IS/WP2 established a number of Specialist Groups to deal with the particulars of specific industry segments. The Specialist Groups include coverage of Terrestrial Broadcast, Production Facilities, Networks, Cable, Consumer

Electronics, Common Carriers, and Satellite Distribution. The Specialist Groups provided expertise in their respective areas to develop the models that will be integrated into the overall implementation scheme.

The principal instrument used by IS/WP2 for modeling the implementation of Advanced Television is the PERT (Program Evaluation and Review Technique) chart and its underlying networks. PERT charts are comprised of a series of tasks and milestones connected together in networks that show the dependencies of later tasks on earlier tasks in any process. They are very powerful concepts used in the management of very large projects. They are supported by microcomputer software which provides analysis capability virtually impossible to achieve manually. Examples of PERT networks were attached to the last interim report and will be included with this report where necessary to the understanding of the discussion.

PERT networks and charts have been developed by each of the specialist groups to model the implementation of Advanced Television in the industry segments which are their areas of concentration. These networks range from simple, single-page charts for satellite distribution and common carrier conversions, to a dozen, multiple-page charts for terrestrial broadcast, network, and production conversions. The PERT networks are based upon implementation scenarios that have been devised by the Specialist Groups for their areas of concern using their experience in those industry segments. Construction of the PERT networks has resulted in the identification of several potential limiters to the implementation process which will be further explained later in this report.

The ultimate objective of the PERT charts is to use them as the foundation for timelines that define the course of the implementation scenarios prepared by IS/WP2. The timelines will show the expected dates (by quarter and year) that each of the necessary tasks can be accomplished and the various milestones reached. This will serve two purposes: to help the Advisory Committee and the FCC in the selection process by examining the relative implementation times of the several systems proposals and to help the industry in managing the implementation once the selection is made.

The activities of IS/WP2 since the last interim report have been concentrated in two principal areas. First, completion of the transition scenarios PERT networks, and timelines. Second, determination of the nature of the various obstacles to implementation identified during the examination of the industry segments necessary to the construction of the PERT charts and timelines.

A. Completion of PERT Networks

Work on the PERT charts, during the year since the last interim report, has concentrated primarily on the terrestrial broadcast, network, and production and postproduction segments, all of which have been under the purview of one of the Specialist Groups. Consideration of the essentially "broadcast" part of the television industry has led to several additional studies and surveys because of the complications of the transition for the broadcasters.

The PERT charts for the broadcast and related industry segments are the most complex of the networks