

# National Cable Television Association ENGINEERING COMMITTEE UPDATE

Tom Jokerst, Chairman

Wendell Bailey, NCTA Staff Liaison

## CHAIRMAN'S MESSAGE

The past two years have posed many challenges for everyone in the cable television industry, not the least of which was the NCTA and the industry's technical community. Certainly the members of the NCTA Engineering Committee have been active with numerous issues such as technical reregulation, the '92 cable bill and the explosion of new technology applications in our video delivery business as well as in new business opportunities. The Engineering Committee continues to be involved in new technologies as well as with issues that relate to our everyday operations such as improving the quality and consistency of video and audio that is delivered to our headends by satellite programmers. Ongoing efforts have made progress with the updating of our satellite recommended practices as well as new recommended graphic symbols for fiber optics systems. I wish to recognize the significant efforts that were made by members of the Quality Sound Subcommittee, Satellite Practices Subcommittee, Standards/Recommended Practices Subcommittee, the EIA/NCTA Joint Committee and the Liaisons with the NEC, NESC and COST.

It is worthwhile to note that all of the subcommittee and liaison participants are comprised of volunteers from the various sectors of our industry. Their efforts contribute to and benefit this great industry that has grown from traditional CATV systems to a developing nationwide broadband infrastructure, and that is unparalleled to that found anywhere else in the world.

The following pages will provide a detailed background on the Engineering Committee, its charter, NCTA staff participation and subcommittee and liaison organization. There will also be individual reports from the various

subcommittees on their activities during the past year or two. Please take the time to review these and direct any comments or inquiries to the NCTA Science & Technology department.

## BACKGROUND

The National Cable Television Association (NCTA) has, since 1952, represented the diverse and growing cable industry before Congress and Federal agencies, in courts of law and before state regulatory agencies. As the principal trade association of the U.S. cable television industry, its members comprise cable television system operators, equipment manufacturers, program suppliers and several ancillary service providers.

Members are provided with forums -- newsletters, committees and an annual convention/exposition, where they may exchange information on developments in the industry and maintain liaison with other industries, societies and groups. The NCTA Engineering Committee is one such forum. Two-day, bi-monthly meetings held mainly at NCTA's Washington DC headquarters, attract 50-75 top level member and non-member cable engineers from all over the country. Subcommittee chairmen reports form an important segment of each agenda.

## STAFF AND SUBCOMMITTEES

To the extent that it is able to identify issues of common concern to members, NCTA strives to propose or recommend ways to address these issues. The NCTA Engineering Committee, its subcommittees and staff liaison department -- Science & Technology -- play a vital role in this continuing process. When an area of concern has

been pinpointed, the Engineering committee often turns to or creates a subcommittee to address the concern. Following the compilation and analysis of a combination of original testing, research, literature reviews and survey results (every effort is made to solicit technical input from all affected interests) subcommittees report their findings to the Engineering Committee. The Committee then reviews and approves final documents and/or recommendations before NCTA acts on them -- in some cases, publishing and distributing a printed product -- though, as you will read in the following reports, often a subcommittee fills an educating, liaison or monitoring function for the Committee and no published documents results.

## CHARTER

The policies of the National Cable Television Association are determined by the Board of Directors. To assist in policy formulation in technical areas, the Board establishes an Engineering Committee. The duties of the Engineering Committee are:

- 1) To respond on a timely basis to Board requests for advice and recommendations on technical matters.
- 2) To forward to the Board advice and recommendations on technical matters which the Committee perceives as having an effect on the policies of the Association.
- 3) To advise the Board of technical developments and innovations which the Committee perceives as having an effect on the policies of the Association.
- 4) To advise the Board of technical developments and innovations which the Committee perceives as having an effect on the future courses of the cable business.
- 5) To assist the technical staff of the Association as requested.
- 6) To represent NCTA by establishing liaison with international and national technical groups.

The activities of the Committee shall include, but not be limited to:

- 1) Regular review of FCC dockets, Notices of Inquiry, Notices of Proposed Rulemaking, etc., having impact upon the technical operation or construction of cable television systems.
- 2) Liaison with appropriate outside technical organizations, associations and professional societies.
- 3) Liaison with international organizations, associations and professional societies whose work may have an impact on the industry.

Membership on the Committee shall be open to all technically oriented employees of members of the National Cable Television Association who are interested in the work of the Committee. The Chairman of the Board of NCTA appoints the Chairman of the NCTA Engineering Committee. Individual voting members are then appointed by the Chairman of the Board of NCTA after consultation with the Chairman of the Engineering Committee.

Notice of meetings shall be sent to all members of the Committee and also sent to interested, qualified parties. Attendance is open to all members of the cable industry's engineering community who are NCTA members.

## ACKNOWLEDGEMENTS

Participation in subcommittee work and Engineering Committee meetings are some of the cable engineering community's most challenging but rewarding endeavors, requiring unusual professional dedication and acumen. NCTA's Science & Technology department joins Engineering Committee chairman Tom Jokerst in applauding subcommittee chairman and members for unstinting and outstanding service to the cable industry.

For current information about the NCTA Engineering Committee, call (202)775-3637 or write to Wendell Bailey at NCTA, 1724 Massachusetts Ave., NW; Washington, DC 20036.

For current information about subcommittee or liaison activities, contact the individual chairmen or liaisons. #

## SUBCOMMITTEES

HDTV (High Definition Television)  
Satellite Practices  
Standards/Recommended Practices  
Signal Leakage  
Quality Sound  
In-Home Wiring  
ad hoc Tech. Stds. Testing Procedures  
EIA/NCTA Joint Committee  
ARRL/NCTA Joint Committee  
SCTE/NCTA Joint Committee

## LIAISONS

Society of Cable Television Engineers (SCTE)  
-Bill Riker 215/363-6888  
National Electrical Code (NEC)  
-Jim Stilwell 215/885-6350  
National Electric Safety Code (NESC)  
-Jim Kearney 703/444-1800  
Institute of Electrical and Electronic Engineer  
(IEEE) -Lawrence Lockwood 703/920-3795  
Advanced Television Systems Committee (ATSC)  
-Bernard Lechner 609/924-7545  
CableLabs -Claude Baggett 303/939-8500  
NIST -Bruce Weintraub 301/294-7606  
COST - Richard Annibaldi 614/876-0771

---

## SUBCOMMITTEE

### REPORTS

#### QUALITY SOUND

Chairman: Ned Mountain  
tel. #: 404/623-0096

Charter: To investigate all aspects of developments with respect to television sound and advise on likely interaction to cable systems. Issues such as surround sound, stereo, "Bose" sound, and "holographic" sound.

Accomplishments and goals: the subcommittee has been active the past year with a primary emphasis on continued investigation of the cable industry's audio level issues. Achievements include: 1) survey of satellite programmers to collect data on peak program levels. Data was obtained representing 26 satellite delivered services. 2) first known attempt to set up a

headend using data provided by the programmers and test equipment. This was done by a small working group consisting of Mike Aloisi (Viacom), Paul Resch (Disney), John Vartanian (HBO), Ken Cannon (Scientific Atlanta), David Eng and Max Morales (CableLabs), and Ned Mountain (Wegener). Members from General Instrument also contributed significantly to this effort by providing a scrambler to enable us to precisely calibrate our reference headend. 3) collection of audio level data on all 26 channels for a one month period. 4) private meetings with several programmers to discuss this data. 5) sharing of preliminary results with the full NCTA Engineering Committee.

Work continues in this area with the following tasks planned for completion during 1993. -- 1) providing the full test data to all participating programmers along with preliminary findings about the data. 2) presentation of an Audio Processing Seminar for all satellite programmers to discuss the role of broadcast grade processing in our operating practices.

As chairman, I want to personally thank my subcommittee members for their work during the past year. It has been a challenge, yet a pleasure to have our diverse opinions and ideas all in sincere cooperation toward understanding and solving this longstanding problem.

#### STANDARDS/RECOMMENDED PRACTICES

Chairman: Dick Shimp  
tel. #: 1-800-336-9681

Charter: To establish or identify field measurement practices quantifying a range of actual cable system operating conditions.

Accomplishments: In 1989, under chairman Mike Jeffers, the subcommittee issued the second edition of the text NCTA Recommended Practices for Measurements on Cable Television Systems. A supplement to the second edition is set for release in 1993 which will cover two areas: 1) fiber optics measurements and graphic symbols, and 2) amendments to existing measurements (jointly published with NATOA or the National League of Cities) due to the FCC's 1992 technical standards testing procedures and requirements.

## EIA/NCTA JOINT COMMITTEE

Co-Chairman: Doug Semon

tel. #: 510/463-0870 VM #350

Charter: To establish and maintain dialogue between the cable and consumer electronics industries for studying and resolving engineering matters of common interest.

Background: The "Joint Committee" was formed in 1982 and has met regularly for the last 11 years. Doug Semon succeeded Dr. Walt Ciciora as the NCTA's co-chair in May, 1991; Mr. William Miller of North American Philips Corporation continues to serve as the EIA's co-chair. About the same time, Mr. Ralph Justus of the EIA replaced Tom Mock, who had served the committee since its inception. The close association with CableLabs has continued under the guidance of Mr. Claude Baggett, who serves as the Joint Committee's recording secretary. For the last two years, the Joint Committee has met every two months without exception.

The purpose of the Committee is twofold. First and foremost, it is a forum for communication and the exchange of ideas, problems and opportunities between the EIA and the NCTA. The Committee's secondary role is setting of voluntary standards related to the interconnection and performance of consumer electronics devices to cable systems. Certain provisions of the Cable Act of 1992 (dealing specifically with the consumer interface) have given the Joint Committee a renewed sense of purpose. As a result, the Committee has volunteered to provide technical guidance to the special FCC Advisory Group that the EIA and NCTA formed to deal with these requirements of the Cable Act.

Accomplishments: The Joint Committee's first voluntary standard was IS-6, which defined the frequency channelization plan which we know today. Until this time, cable channel designations varied among manufacturers, resulting in confusion even within the cable industry itself. Today, compliance with IS-6 is universal among manufacturers, although it is not uncommon to find printed literature still using pre-IS-6 designations for midband and superband channels.

Following the success of IS-6, the Committee took on the problem of receiver RF performance in the cable environment. The result of this work, IS-23, deals primarily with direct pickup interference (DPU), tuner overload from the pure number of cable signals at the input, and local oscillator leakage from the tuner. Despite agreement within the Committee itself, IS-23 never made it to the Recommended Practice stage. It is appropriate to point out, however, that many consumer electronics manufacturers have substantial improvements in the area of RF performance because of this work.

Perhaps the best known (and least successful) accomplishment is RS-563, also known as IS-15 or MultiPort. This standard is paradoxical: it is a field-proven technical standard but it never gained widespread acceptance among cable operators or consumer electronics manufacturers. At one time, MultiPort descramblers were available from some, but not all, traditional addressable scrambling system manufacturers.

The most recent standard developed by the Committee is an extension of IS-6 to 1 GHz. This action has been approved by the full Joint Committee and is currently waiting approval from all EIA member companies. Full standard status is expected by midyear.

Future Activities: As mentioned above, the Committee is currently addressing several possible solutions to the "customer-friendly" mandate of the Cable Act of 1992. Among these are a renewed and revised MultiPort, broadband descrambling and interdiction systems, a national scrambling standard, and others. The Committee is also discussing another extension to IS-6 that would define "sub-channel" identification of compressed signals, and continues to address those issues surrounding the concept of "cable ready" including DPU and other RF performance areas.

Of greatest importance, however, is that the Committee continues to be the only official vehicle for maintaining an open dialog between engineers in the cable industry and the consumer electronics industry. This ongoing teaching and learning process may represent the best chance for ultimately solving the consumer interface dilemma. Even if the two industries have dissimilar and sometimes conflicting business

goals, they do have the same customer base. The EIA/NCTA Joint Engineering Committee continues to believe that both industries benefit most from providing these same customers with the best, easiest to use, technically sound and economical solution that can be devised. **That is our joint goal.**

#### **ARRL/NCTA JOINT COMMITTEE**

**Chairman: Robert V.C. Dickinson**  
**tel. #: 215/691-0100**

The Amateur Radio Relay League (ARRL) /NCTA Joint Committee was formed in 1983 and has been involved with coordination of the Cable and Amateur Radio communities in CATV signal leakage matters. In the early days the committee did some investigation of the signal leakage mechanisms in the field. This exercise was informative and became the basis for ongoing cooperation between the organizations. In the past several years the committee has been involved largely with addressing specific situations where amateurs have been dissatisfied with the performance of cable operators and vice versa. These efforts have been aimed primarily at preventing each specific situation from escalating to a complaint to the FCC. The committee is often able to coordinate the solution of the problem at hand.

The work of the committee has, in part, contributed to the improvement in relations with the amateurs and hopefully in achieving greater awareness on the part of the cable operators. The cable industry has made great strides in attitude improvement toward the "hams" and is to be commended for its efforts.

At present the work of the committee continues to address specific complaints as they are brought to its attention by both cable and amateur parties. There have been only a few complaints in the last 12 months. These have been largely resolved through the efforts of Roger Pience and the Chairman. The ARRL has shouldered its responsibility and the entire effort remains cooperative and effective. At present the active members are Brian James of CableLabs, Roger Pience of NCTA, Ned Mountain of Wegener Communications, the Chairman, plus Hugh Turnbull, Atlantic Director of the ARRL and

other ARRL associated amateurs whom he recruits as required.

We expect the activities of the committee to continue at about the present level so that additional members are not currently needed, however, in case of emergency, there are several long time volunteers who can be called upon to assist.

#### **SIGNAL LEAKAGE**

**Chairman: Charles L. Cerino**  
**tel. #: 215/981-7654**

Charter: The functions of the Signal Leakage Subcommittee are as follows: 1) Inform and educate the cable television industry about regulations and interpretations relating to the Federal Communications Commission Rules (47CFR), Part 76 - Cable Television Service, Subpart K paragraphs 76.610 through 76.616 on signal leakage performance criteria. 2) Maintain a good working relationship with the Federal Communications Commission's Cable Television Branch personnel. 3) Take appropriate action to resolve related issues between the industry and the Federal Communications Commission when they occur. 4) Report all activity to the NCTA Engineering Committee.

Accomplishments and Goals: Since the creation of this subcommittee, under Ted Hartson, many interpretations of the FCC regulations were drafted. The industry was educated to the requirements through many NCTA and SCTE sponsored seminars conducted by members of this subcommittee. Key to effecting the change in the industry was maintaining a good working relationship with the FCC. Future plans call for the continuation of process as outlined in our charter as well as interface with the SCTE CLI subcommittee. Interested parties are welcome to contact the chairman.

#### **HIGH DEFINITION TELEVISION (HDTV)**

**Chairman: Nick Hamilton-Piercy**  
**tel. #: 416/391-7226**

Charter: This subcommittee on HDTV was formed by the NCTA Engineering Committee in 1987 to closely follow the rapid developments

taking place in HDTV technology; to interpret what impact the transmission of HDTV signals would have on cable television distribution networks; to determine what is needed to accommodate these signals; and to liaise with the various proponents on HDTV systems on the unique requirements of cable/microwave/satellite transmission.

Accomplishments 1992/1993: The Subcommittee's prime focus over the last reporting period has been on supporting the cable testbed testing of the various HDTV proponent systems conducted by CableLabs at the Advanced Television Test Center. The Subcommittee provided expert viewers to assist in detecting visible impairment thresholds and other criteria.

In early 1992, the industry embarked on a program to evaluate the effectiveness of various ghost cancelling equipment reference signals. Subcommittee members participated in the testing. Subsequently, a North American reference signal standard was chosen and a major manufacturer provided headend quality equipment to this standard. Early production units were obtained by the Subcommittee members and were subject to rigorous in-field testing which proved the technology is quite successful for completely removing ghosts in a headend environment.

The Subcommittee reviewed various digital and ATV test plans developed by CableLabs and provided input. In particular, the group helped develop the cable segment for the planned over air testing of the selected ATV proponent system. Testing to this plan is anticipated for mid to late 1993.

Several members of the Subcommittee are also participants on various CableLabs Subcommittees and in that role augment the HDTV Subcommittee work through such projects as digital transmission testing on cable in preparation for NTSC digital video compression services and future ATV services and inputting to the MPEG standards activity.

The expected role of the Subcommittee through 1993 will be "watching brief" on the final selection of an ATV system and the introduction of digital transmission of NTSC and ATV services. Subcommittee members will be called to assist in

the final ATV system field tests anticipated to occur in late 1993.

#### **IN-HOME WIRING**

**Chairman: Larry Nelson**  
tel. #: 704/324-2200

The subcommittee continues to examine the needs and requirements for the in-home portion of the cable plant and ways of articulating them to a growing group of non-professional installers -- building and/or electrical contractors and homeowners.

This subcommittee was formed in recognition of the increasing complexities associated with cabling homes due to the growing availability of low quality materials, home automation systems, and the added technical and service performance responsibilities to the operator.

The ways and methods endorsed by this subcommittee will in no way be directed at influencing operating policy decisions of any operator.

#### **SATELLITE PRACTICES**

**Chairman: Norman Weinhouse**  
tel. #: 818/884-3105

Nineteen hundred and ninety-two was a year in which two new satellites were added to the constellation serving cable systems (Galaxy V and Satcom C4). In addition, two older Satcoms were retired and were replaced in their original orbital slots by new more powerful satellites (Satcom C3 and C5). The transition to the new and replacement satellites appears to have been relatively smooth although there were numerous programmer changes in satellites, transponder numbers, and polarization. During the year, the Satellite Practices Subcommittee attempted to appraise the main committee of these changes. The programmers did a great job of notification to affiliates which made the transition relatively painless.

A "Good Practice Bulletin" was generated in 1992 and distributed to cable programmers in an attempt to obtain better uniformity of video levels. That bulletin was titled "Establishing and

Maintaining the FM Deviation in Satellite TV Transmissions to Cable Systems". It contained a recommendation to include COMPOSITE and COMBINATION vertical interval test signals (VITS). It also contained detailed instructions to uplink operators on methods to adjust for the proper FM Deviation in the satellite link.

An addendum to that bulletin will be sent sometime in 1993 to further assure video level uniformity and to guard against overmodulation.

**ad hoc TECHNICAL STANDARDS TESTING PROCEDURES**

**Chairman: Sid Fluck**  
**tel. #: 303/939-8500**

The subcommittee, comprised of system operators and test equipment manufacturers, was first established when the FCC released its Notice of Inquiry on cable television technical standards in April 1992. The group was tasked with writing new testing procedures that would comply with anticipated FCC rules requiring annual cable system performance testing. Meetings and teleconferences began in January 1993 some weeks after the FCC released clarification and reconsideration of the rules in late 1992.

**Achievements:** creation of relevant updates to the **NCTA Recommended Practices for Measurements on Cable Television Systems** (2nd ed.). Following a vote by the full NCTA Engineering Committee and acceptance by NATOA, the measurement techniques will be jointly published by NATOA and NCTA and distributed widely. Registered holders of the 2nd edition, NCTA Recommended Practices notebook will receive the updates by the end of the year.

**SCTE/NCTA JOINT COMMITTEE**

**acting chairman: Tom Elliot**  
**tel. # 303/267-1344**  
**alternate: Tom Osterman**  
**tel. #206/623-8670**

This joint committee was formed in the Spring of 1992 to investigate power quality and its relationship to subscribers' picture quality. Its goal is the specific engineering evaluation of power supply characteristics in relation to digital and analog signal processing equipment.

**Regional Interconnect Networking**

**chairman: Joseph Stern**  
**tel: 212/725-5470**

Charter under development -- April 1993