NCTA ENGINEERING COMMITTEE 1986-88 UPDATE

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INTRODUCTION

During 1986 & 1987 several issues dominated the committee's work. Included among them were the A/B Switch, HDTV, Cumulative Leakage Index (CLI), The EIA Multi-port, Consumer Interconnection with cable, and Competitive Technologies (including Telco). Numerous other issues arose and were dealt with. Routine work requiring constant attention from the committee also received expeditious handling.

The A/B switch posed serious problems for the cable industry. The most obvious aspect of the difficulties was the cost of installation and materials. However, a much more serious consequence could be seen by the Engineering Committee. Improper installation of the switch could result in significant radiation of cable signals. In fact there is only one correct installation configuration and several erroneous methods. The hazard of interference with aircraft communications and navigation was increased by the fact that these signals would be connected to antennas all pointed in roughly the same direction. A mechanism of efficient, focused radiators was created at a time when cable engineers were struggling with ways to reduce leakage. Special thanks go to Dave Large who worked to investigate and inform the committee and the FCC of the technical issues.

The Subcommittee reports which follow provide a review and status report of the Committee workings.

The December meetings in both 1986 and 1987 were held in Denver. This resulted in greater attendance from Colorado and West Coast engineers. This may become a traditional site for the last meeting of the year. A meeting attendance record was set at seventy five for the first meeting of 1988.

The sections below repeat the information from the 1985 report by then chairman Robert A. Luff. They are repeated here for the convenience of the reader.

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--newletters, 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 SUBCOMMITTEE FUNCTIONS

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 result.

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 parites. Attendance is open to all members of the cable industry's engineering community who are NCTA members.

ACKNOWLEDGMENTS

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 Walt Ciciora in applauding subcommittee chairmen and members for unstinting and outstanding service to the cable industry.

- 1988 NCTA Technical Papers editor, K. Rutkowski-

For further information about the NCTA or Engineering Committee, call (202)775-3637

CONSUMER INTERCONNECT SUBCOMMITTEE

David Large, Chairman

CHARTER

The Consumer Interconnect Subcommittee was formed by the NCTA Engineering Committee in 1985 for the purpose of exploring short-term solutions to the problems of interconnecting various combinations of consumer video equipment to cable television systems. The Engineering Committee felt that longer-term solutions were being dealt with by such groups as the EIA homebus group, the EIA/NCTA Joint Committee, and the EIA Decoder Interface group, but that such solutions would be years in coming because they only affected future production of products. The Consumer Interconnect Subcommittee has limited its scope to dealing with the currently installed base of consumer equipment, with its thrust being the instruction of cable operators and suppliers in appropriate solutions and adequate specifications for cable-supplied interconnection equipment.

ACCOMPLISHMENTS

The major accomplishment of the Subcommittee to date has been the submittal of an extensive tutorial report to the parent committee (late 1986). This tutorial was published in CED Magazine in three removable sections in the period April-June, 1987 and is available from either CED or NCTA as a reprint. In response to a call to extend our reach beyond the technical community to management, Mr. Large presented a management session paper at the 1987 NCTA Convention based on the business consequences of following the recommended solutions in the tutorial. This paper will be published in the December (Western Show) edition of Cablevision Magazine.

FUTURE ACTIVITIES

Two addendums to the original report are currently planned. The first recognizes that there is a move in some parts of the cable industry away from set-top converters and towards outside-the-home signal denial schemes. Since the cable company need install no unique equipment within the home, the customer assumes, by default, the major responsibility for in-home wiring. While such schemes, based on some form of positive or negative trapping, have advantages in "friendliness" to cable-ready consumer hardware, they raise issues of signal leakage control. That is the subject of a report authored by Roy Ehman for the Subcommittee.

An area not explored in the original report was baseband interconnections. Most VCR's, many television sets and several converters and descramblers offer video and/or audio connections. Use of these signals may result in increased switching flexibility and will almost certainly result in better quality pictures. More importantly, it may be the only way to realize the benefits of stereo sound under certain circumstances. A second addendum, authored by Dave Large, covers this area.

HIGH DEFINITION TELEVISION (HDTV) SUBCOMMITTEE

Nick Hamilton-Piercy, Chairman

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 of HDTV systems on the unique requirements of cable/microwave/satellite transmission.

BACKGROUND

Television set technology is making a substantial leap forward as a consequence of the introduction of digital processing circuitry at the consumer level. At moderate incremental cost television sets can be made intelligent enough to overcome many of the short comings of the North American (NTSC) television transmission standard and can accommodate new standards such as that associated with high definition television (HDTV).

Evolution within the traditional analogue circuits and display technologies is also taking place which enables the conventional television receiver to produce quite handsome television images with resolutions approaching the theoretical obtainable from standard NTSC signals.

The full potential of these new technology receivers becomes clearly evident when they are directly connected to video cassette source material, however, the transparency of the traditional cable distribution network may sufficiently compromise delivery of improved NTSC or HDTV signals to the extent that the consumer may be inclined to adopt other program distribution infrastructures for their entertainment fare.

Recent customer attitude surveys have already shown a general dissatisfaction in the quality of cable distributed signals even though substantial improvements have been made to these networks over the last few years. One reason for this growing dissatisfaction is that customers now have a daily comparison against which they can assess cable television signal quality. Over 50% of the cable customers have in-home video cassette players and an A/B comparison occurs every time it is used. The industry is fortunate in that much of the video cassette material is worn rental tapes of questionable quality.

These same customers are often exposed to high definition video images at the work place, school or during leisure hours. The word processor, the desk top computer, the computer control of industrial machinery, and the video arcade present this group with a barrage of video images all substantially better in quality than can be provided by present cable distribution networks. Customers often ask why they cannot read the credits for a television movie yet the text is not smaller than the capital letters on their word processor or home computer. Should this dissatisfaction with quality truly be a result of this day to day comparison, then the industry could find itself with a severe problem following the introduction of super VHS/Beta video cassette formats, or other sources of enhanced quality video programming (direct to home satellite, MMDS, video disk, even new off-air broadcast transmitters, or off-air signals viewed through the A/B switch, etc., etc.)?

The problem is being considerably exacerbated by the recent presence of the new technology large screen televisions which tend to emphasize cable's transmission shortcomings, especially at the closer than ideal viewing distances found in the smaller home. In the older television sets the images were sufficiently soft and blurred that echoes, beats and certain types of noise were not really noticeable. Their audio systems and minute loud speakers compromised the sound to the extent that the cable added distortions and noise were just not noticed. Many of these same customers are now using state of the art comb filter equipped 25 inch or larger television receivers with stereo sound and good quality speakers.

WORKING COMMITTEES

Recognizing the foregoing concerns and recognizing the timeliness of providing input to the various HDTV proponents on the requirements of cable retransmission, the Engineering Committee of the NCTA decided the issue was of sufficient importance to form a sub-committee whose mandate is to address the whole subject area. There are a multiple of unknowns and many of the answers are needed soon if they are to be useful in influencing the HDTV transmission standards formation or to assist cable operators in their preparation of their distribution networks for these new signals.

Early answers are also needed for improving the transmission transparency of the existing networks to help stem the current growing customer dissatisfaction with picture quality. Whether it is improving the present system for the present NTSC signal and enhanced NTSC signal or a full HDTV signal many of the problems are common, therefore at last initially there seems no need to have separate committees addressing the concerns of each standard. However, it does appear productive to address the subject area through three interrelated groups.

Group 1, Transmission Channel Characterization, Group 2, Liaison and Group 3, Super Cable.

The Group 1 activities (under the guidance of Dan Pike) are to examine the transmission aspects of video signals of both present and future standards through mediums such as co-axial cable plant, AML systems, FML systems (narrow band and wide band) and satellite. The question that faces this group is why do even well designed cable systems compromise the quality of a normal NTSC signal (softening of the resolution, busyness of the background, etc.) even though measurement of the usual parameters would indicate the network as being transparent? The extension of this question is whether the mechanisms causing this degradation will have equal or worse effect on an HDTV signal. Once the cause is understood then the task is to provide guidelines on how to minimize these effects.

The end goal of Group 1 is to provide a comprehensive "transfer function" of the transmission media for each part of the distribution chain be it the satellite link, terrestrial microwave, the AML system, or the cable network itself. The findings of Group 1 are passed to Group 2 for dissemination and discussion with the HDTV proponents and consumer electronic suppliers. Initially, work will be the characterization of the effects of some of the less traditional distortion mechanisms such as phase noise and micro-reflections, etc. Other work will include a reevaluation of the subjective effect of discrete echoes in a progressive scan scenario, the subjective effect of beat noise in the increased band widths associated with high definition transmissions and so on and so on.

The Group 2 focus is directed more towards providing a very tight liaison with the developers of enhanced and high definition television systems and equipment as well as ensuring a continuous dialogue is maintained with other groups such as NAB, ATSC, SMPTE, etc., etc. It will be the responsibility of Group 2 to take the findings from Group 1 and ensure these are disseminated to the developers of these new systems and equipment. It will also be the responsibility of Group 2 to provide the status reports and information pieces necessary to advise the industry on the progress of HDTV developments and the necessary steps to prepare for its introduction.

It can be anticipated that once Group 1 has characterized the distribution infrastructure and the requirements for successfully distributing high quality NTSC and HDTV signals then the two groups will merge into one body whose main focus will be the implementation steps towards HDTV.

The Group 3 Super Cable activities (under the guidance of Paul Perez) is focusing its attention on ways and means of taking a component style signal such as "Super VHS" and transmitting it through the existing cable distribution network with the aim of providing a superior quality picture to those customers with appropriately adapted luminance/chrominance input monitors. This is seen as an interim scenario for quality picture transmission while the various advanced television systems develop.

ACCOMPLISHMENTS

The major accomplishment of the Group 1 working committee is the identification, measurement and characterization of phase noise. This distortion is one of the principle contributors to the background busyness effect seen in many cable systems pictures. Two comprehensive dissertations are contained in the 1988 NCTA Technical Papers showing results of this testing and the causes of this unique distortion. Other preliminary testing activities in the area of reflections and in-channel fine grain transmission responses have also taken place.

The liaison group, Group 2, has focused most of its attention on developing an industry input in response to the FCC's Notice of Inquiry and subsequent analysis of other organizations submissions. The group also developed a comprehensive response in comment to the FCC on the various submissions. Other Group 2 accomplishments included the development of a draft cable transmission test plan for use by the Advance Television Systems Committee's transmission and Distribution Specialist Group T3S4 and the description of a generic cable system (tutorial narrative and schematics) for dissemination to ATS developers, broadcasters and others unfamiliar with cable television distribution networks.

Group 3 (Super Cable) was formed in the latter part of the reporting period and is focusing its attention on planning and feasibility investigations into cost effective technologies to distribute the component signal.

FUTURE ACTIVITIES

The immediate future focus will be on the continuation of cable transmission characterization. As soon as any of the competing ATV system hardware is available testing will be conducted by subjecting the system to the characterized transmission distortions to determine the sensitivity to these impairments. Guidelines will be developed on the minimum transmission standards necessary for successfully distributing HDTV signals and disseminated through the industry. This will likely be an iterative process with ATV system promoters presenting further evolutions of their hardware and the group feeding back results. Once the "final" version of ATV hardware is available from each promoter the group in conjunction with the ATSC will subject each to a side by side evaluation and qualify each as to its merits and disadvantages in the cable transmission environment.

Close liaison with program originators and ATV system manufacturers will continue to ensure both are kept fully appraised of the cable operators concerns and technical distribution capabilities while obtaining from them latest details of their origination and reception equipment developments.

Should the developments of HDTV emission systems not follow a path appropriate for retransmission through cable of a superior picture, then focus will be directed in establishing alternate technologies/formats more suitable for cable transmission.

MULTIPORT COORDINATION

Joseph Van Loan, Chairman

CHARTER

Coordinate implementation of the EIA Multiport Standard Baseband Interface within the Consumer Electronics and CATV industries.

ACCOMPLISHMENTS

With support from ATC provided a neutral testing facility in ATC's Denver laboratory. Arranged for manufacturers to make TV receivers, scramblers, descramblers and other equipment available to the lab for testing by manufacturers developing EIA Multiport products. Arranged and staffed EIA Multiport exhibits at NCTA and Western Shows. Conducted a survey of top 50 MSO's willingness to use EIA Multiport products when they become available. Held meetings with MSO's using baseband interface, TV receiver and VCR manufacturers and with CATV decoder manufacturers to make them aware of the benefits of the interface and the industry's willingness to support it once it becomes available. Give presentations to management, marketing and technical groups to acquaint them with the advantages of a standard decoder interface.

1988 PLANS

Plans for 1988 include a survey of signal ingress in "cable ready" TV receivers among the top 50 MSO's. Conduct the first field trials of EIA Multiport using production TV receivers and pre-production decoder units. Continue exhibiting at major trade shows. Continue to give presentations to groups concerning the use of the decoder interface standard.

SATELLITE PRACTICES SUBCOMMITTEE

Norman Weinhouse, Chairman

There were several issues addressed by the Satellite Practices Subcommittee in 1987. Two issues involve comments before the FCC, and three issues which were undertaken to assist satellite programmers and the cable operators who receive those programs.

A. ISSUES BEFORE THE FCC

1. Modification of Part 25 of the Rules. cc. Docket No. 86-496

In this docket, the FCC proposes to make extensive changes and additions to part 25 of the Rules. Administrative and licensing matters which had previously been treated on an ad-hoc basis are codified in these proposed rules. In addition, the Commission proposed operational procedures which are intended to reduce alien interference between satellite systems. In some cases, these procedures are detrimental to cable's interests. Some of the proposed technical standards needed clarification.

The subcommittee provided extensive inputs to the staff. Comments were filed by NCTA on June 8, 1987. The Commission has not taken further action in this docket.

2. Automatic Transmitter Identification System (ATIS) - General Docket No. 86-337

The Commission instituted a Further Notice of Proposed Rulemaking (FNPRM) on ATIS of Satellite Video Carriers, based on digital modulation of the energy dispersal signal in a satellite transmission. Earlier (in 1986) the Commission instituted a NPRM for ATIS based on digital modulation in the television vertical interval.

In the earlier NPRM, NCTA and others made comments which deprecated the use of vertical interval for ATIS, prompting the FNPRM. In its comments to the FNPRM, NCTA was generally supportive of the energy dispersal method, but cautioned the Commission that it was an untested technology which needed further refinement and extensive testing. NCTA and most other commenters suggested delay in implementation until this technology could be completely tested in a real world environment.

The Commission has not yet taken further action in this docket.

B. SATELLITE PRACTICE ISSUES

The subcommittee started work in December of 1987, with the object of generating "Good Engineering Practice" bulletins for the following items:

1. Audio levels (monaural and stereo) for Videocipher II transmissions.

2. Use of subcarriers with Videocipher II transmissions.

3. Use of a "more reliable" method of signalling (cue tones) and communication by programmers offering advertising availabilities to cable operators.

Items 1 and 2 have been generated and will be reviewed by the subcommittee. It is expected that these two documents will be submitted to the main engineering committee at its next meeting in April. It is further expected that a document dealing with item 3 will be submitted to the main engineering committee in either the June 1988 or the August 1988 meeting.

MULTI-CHANNEL TV SOUND

Alex Best, Chairman

CHARTER

The Multi-channel TV Sound Subcommittee was formed by the NCTA Engineering Committee in 1983 for the purpose of evaluating compatibility between three proposed broadcast television stereo systems (Zenith, EIAJ, and Telesonics) and existing cable technology. The Engineering Committee felt that the BTSC (Broadcast Television Systems Committee) committee guided by the Electronic Industries Association had failed to consider the impact of cable carriage on any of the proposed systems. At this time the EIA was advocating a selection of one of the three systems by voting members of the BTSC (the NCTA represented one of the 13 votes to be cast).

ACCOMPLISHMENTS

The accomplishments of the subcommittee to date have included written test procedures to the EIA which was one factor in creating a one-year extension on testing of the three stereo systems. The NCTA then decided to perform its own tests. During the summer of 1984 a detailed test procedure was written and an engineer was hired (Brian James) to conduct cable related tests of the BTSC systems. A report on the results of these tests was made available to the office of the NCTA. The results were also made known to other interested parties through presentations at various national, regional, and state association meetings. As a result of this effort, the NCTA was successful in winning a non-must carry status from the FCC on the stereo portion of a broadcast television signal.

FUTURE ACTIVITIES

The Multi-channel TV Sound Subcommittee was reactivated in 1986 with a charter to define and document a series of test procedures to assist cable operators in evaluating stereo encoders. In addition, an error budget (separation) will be developed to aid cable operators in achieving an overall level of quality by knowing the contribution of each component. It is anticipated that the end product of this effort will be a document similar to the NCTA Recommended Practices for Measurements on Cable Television Systems.

AD HOC 75 OHM STANDARDS SUBCOMMITTEE

Ron Hranac, Chairman

CHARTER

The ad hoc 75 Ohm Standards Subcommittee was formed in late 1987 to investigate the feasibility of establishing National Bureau of Standards (NBS) traceability in 75 ohms. 50 ohm NBS traceability has existed for some time, but these standards do not directly support 75 ohms. Advances in CATV technology, industry deregulation, and the increased availability of 75 ohm test equipment suggest that such standards be established to assure measurement accuracy and repeatability.

ACCOMPLISHMENTS

Due to the creation of the ad hoc subcommittee so late in the year, major accomplishments have centered around three areas; recruiting individuals to serve on the subcommittee; securing the unofficial support of a number of test equipment and product manufacturers; and making initial contact with NBS.

NBS officials have indicated that standards development usually begins one of two ways: lobby Congress to obtain funding for research, a process that takes several years. Or, obtain private sector (eg., CATV and related industries) support and research funding. The second approach will be the most feasible for 75 ohm standards work, since much footwork can be accomplished by the CATV engineering community.

FUTURE PLANS

The subcommittee plans to collect information on existing 75 ohm standards, and develop parallels, where possible, with 50 ohm standards and traceability. The subcommittee will then determine the cost to establish basic NBS 75 ohm traceability, and recommend how the CATV industry can pursue standards development.

SIGNAL LEAKAGE SUBCOMMITTEE

Ted Hartson, Chairman

During 1987 the signal leakage subcommittee assisted the NCTA in providing input for FCC filings regarding A/B switches, set-top devices and more recently in the pending docket on Part 15 standards. The subcommittee provides assistance to state associations and operators, by providing speakers and information to assist in the formulation of aggressive signal leakage programs.

As we approach the June 1990 deadline for aeronautical offsets and CLI compliance, signal leakage, its investigation and containment will become even more important to the industry. The subcommittee welcomes inquiries and participation by interested parties. Further information may be obtained from the NCTA Office of Science and Technology.

1988 TECHNICAL PROGRAM SUBCOMMITTEE

Wendell H. Bailey, Chairman

CHARTER

To choose topics, moderators and panelists (speakers/authors) for ten ninety-minute technical sessions and authors for papers printed in NCTA's annual convention proceedings, NCTA Technical Papers.

ACCOMPLISHMENTS

The five-member team choosing participants for the 1988 show selected thirty four technical paper proposals from a field of eighty five responses to the "Call for Papers".

Joint EIA/NCTA Engineering Committee

1987 Subcommittee Annual Report

Walter S Ciciora, Ph.D., Chairman
Vice President, Technology
American Television and Communications
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Charter

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

Background

The Joint EIA/NCTA Engineering Committee was formed in 1982 under the leadership of Bob Rast, whose many years of experience with RCA and whose position at ATC facilitated the construction of a bridge between the cable and consumer electronics industries. Many loyal souls have served the purposes of the committee over the years. 1987 saw serious economic difficulties in the consumer electronics industries and the transfer of ownership of major assets. This brought early retirement to several of the committee's strongest contributors. Tom Mock of the EIA continued his invaluable services as facilitator. To all of these, both industries offer their thanks.

While the primary purpose of the committee is communication between the two industries, a secondary and perhaps more visible role is the creation of voluntary technical standards to improve performance of consumer electronics products when used on cable systems. These standards do not have the force of law but depend on the good will of the participants for there efficacy. This approach has been successful in the past.

Accomplishments

The committee's first major accomplishment was the creation of a frequency channelization interim standard, IS-6. A significant part of this standard is the definition of an orderly procedure for numbering increased channel capacity on cable systems and adding new tuning capability to consumer electronics products. This work has subsequently achieved full standard status and is designated as EIA 542.

The second accomplishment was the agreement on IS-23, the RF cable interface interim standard. The standard was subsequently tabled until further research into quantifying the need for stronger direct pick up, DPU, requirements was completed. Simultaneously, an investigation on the practicality of better DPU hardware techniques was carried out.

The third accomplishment was the ratification of IS-15, the baseband decoder interface interim standard and agreement on an intermediate frequency interface recommended practice. Several manufacturers of TV receivers have introduced product with IS-15 plugs on the back. Most of the manufacturers of cable descramblers have developed prototype units and some are working to bring them to production. Cable operators have placed purchase orders for these units and are awaiting delivery.

Some difficulties over detailed interpretation of the IS-15 specifications have been experienced and, as of this writing, appear to have been resolved. A consequence of this has been a careful review of the interim specification with the goal of tightening up the language.

Since the creation of IS-15, a major change in direction has been taken by the consumer electronics industry in the methods of transporting video between devices. The advent of Super-VHS and ED-Beta have brought along with them the "S-plug" which embodies a new method for video transfer, the "C/Y" format. The committee is finalizing a procedure for optionally carrying this electrical format. Mechanical conversion is by adapter plug or a cable with appropriate terminations.

Currently, considerable attention is being given to approaches for implementing "pay per view" and other services in an IS-15 environment. Ideally, the subscriber uses only one remote control hand unit to operate all functions including impulse purchase of video or home shopping wares.

Prototypes of TV receivers and decoders have been demonstrated at the 1986 and 1987 Western Cable Shows and the NCTA Convention in 1987. Papers have been presented in both technical and management sessions at these shows. In addition numerous other forums and publications have been used to publicize the work of the committee to both industries. Of special note are cable papers at the IEEE's International Conference on Consumer Electronics (ICCE) and papers at the Montreux Television Symposium in Switzerland.

Future Activities

Two major goals for 1988 are to bring the IS-15 Multiport Interim Standard to full standard status and to make progress on IS-23.

Of course the primary subcommittee goal of maintaining dialogue between the two industries will continue to receive attention. A special effort in this regard is a short course on cable practice for non cable engineers to be presented ahead of the IEEE ICCE in June in Chicago. Consideration is being given to ways of increasing awareness of US cable practice among the consumer electronics designers of Japan and other far east countries.

The EIA Multiport needs a success story. Work continues on putting all the pieces together to demonstrate the full power of the concept.

SPACE WARC

Paul A. Heimbach

1. Represent the NCTA in the preparation for the August, 1988 Conference on the Use of the Geostationary Satellite Orbit and the Planning of the Space Services Utilizing it (SPACE WARC).

2. Maintain a liaison between the NCTA and the United States organizations, private and governmental, that are preparing the U.S. positions to be presented at the SPACE WARC Conference.

3. Ensure that cables' interests from the perspectives of cable operators, program distributors, equipment manufacturers, and other NCTA members are represented in the U.S. positions at the SPACE WARC Conference.

1987 ACCOMPLISHMENTS

Monitored and participated in those SPACE WARC activities that will significantly affect the continued operation of the U.S. domestic satellite service. In particular, the creation of new planning procedures for the currently used C and Ku FSS bands have been the major areas of concern. The U.S. is attempting to fabricate a planning procedure that will provide fair and equitable access to the geostationary arc for all countries while preserving the flexibility and service continuation assurances that exist today.

The SPACE WARC meeting will convene in Geneva, Switzerland in August, 1988.

PLANS FOR 1988

Participation in activities that are a result of the 1988 SPACE WARC Conference.

ARRL/NCTA LIAISON

Robert V.C. Dickinson

There has been very little action in this area in some time. Brian James and Bob Dickinson are the only current active liaisons between NCTA and the American Radio Relay League.

There have been no formal leakage complaints forwarded through the ARRL within the last year. Our periodic checks with ARRL members indicate that the general feeling is that things are more or less under control. ARRL is now more concerned about the Part 15 rewrite and feel that they have a good working relationship with NCTA.

During the coming year we expect to maintain our liaison function while urging continued cooperation of cable operators with local amateur groups, since this has seemed to have been the key to our greatly improved relations. There is a possibility that additional testing of leakage implications in the upstream cable channels will be initiated during the coming year.

IEEE LIAISON

Lawrence W. Lockwood

The Institute of Electrical and Electronics Engineers, Inc. is the world's largest professional engineering society. A few of the 30+ special interest Societies in IEEE address issues in journals, committees and standards-setting groups that affect the cable TV industry.

Due to agreements obtained by liaison with IEEE committee members special reciprocal publishing arrangements have permitted NCTA technical papers to be reprinted in IEEE Communication Society journals.

On the standards front, work on Local Area Network standards, the 802.7, is progressing satisfactorily. It is likely to reach IEEE final approval by the end of 1988. The standard will then proceed to ANSI for concurrence and issuance as a combined standard for the U.S.

ADVANCED TV SYSTEMS COMMITTEE (ATSC) LIAISON

Jud Hofmann

PURPOSE

The ATSC has been the national forum for consideration of a new national TV system(s), and methods of enhancing our existing system. It is important to track the progress made by the ATSC, so that the cable industry can be kept informed of, and influence, events which will shape its future in the next few years.

1987 EVENTS

The ATSC began 1987 with the decision of how to handle the next step in the establishment of a production, or studio, standard for HDTV. The effort in the CCIR to establish the 1125/60/2:1 system as a world standard has run into strong resistance from the European governments: this resulted in a CCIR decision to defer its decision on a single worldwide standard. The decision in the ATSC as to what the next step would be was relatively straightforward: make the 1125/60/2:1 system a US standard in cooperation with the SMPTE.

That activity was one of two focal points for the HDTV Technical Group: in the latter part of 1987, SMPTE finished the document defining the parameters of the signal waveform and the parameters of signal interchange between equipment.

Transmission testing and transmission demonstrations were the second focal point of the HDTV T/G in 1987. Preliminary tests were being made in the UHF to look for differential transmission characteristics between separated channels. Plans went forward for testing at frequencies above 1 GHz. Liaison between the NCTA HDTV Subcommittee and the ATSC T3S4 testing was tightened up.

The demonstration transmissions of MUSE HDTV in Washington DC and Ottawa, Canada went a long way to awaken broadcasters, cable people, Congressmen, and the FCC to the reality of HDTV. Partially as a result of this, the FCC opened an Inquiry into HDTV.

As a result of the sudden awareness of HDTV across the nation, the ATSC is suddenly growing in membership.

1988 ACTIVITY

1988 will be a critical year for the ATSC. The FCC Inquiry is said to exist only to bring forth the critical issues in broadcast HDTV, not to choose a system. Presumably, this means that the ATSC will get that task. The ATSC must organize itself to handle this task, and the cable industry must strongly participate in the process.

EIA CONSUMER ELECTRONIC BUS COMMITTEE LIAISON

Jud Hofmann

PURPOSE

The CEBC is generating standards for residential communications on many media, but the most important is the coaxial bus (CXBus). It is expected that this media will be used to deliver cable signals and the output of converters around the home.

The second most important media is InfraRed (IR), which can be used for universal remote controls.

1987 EVENTS

The topology of the CXBus and the node structure needed to get signals on and off the bus were defined. The primary contribution was from Scientific-Atlanta, and arrangements are being made to build a prototype.

The importance of the prototype, in addition to testing performance factors, is to determine the leakage problems that the CXBus will present and to find methods of solving them.

Coding and modulation method to be used for the IR media have been defined, and prototyping equipment will be built to test the ability of the system to reject interference from present remote control systems.

1988 ACTIVITY

Finish prototyping and testing, begin circulation of draft CEBus Standard.

SCTE LIAISON

William Riker

GOAL

Inform NCTA Engineering Committee membership of current activities of the Society of Cable Television Engineers, Inc., often requesting input concerning specific programs or issues. SCTE representative will also update its Board of Directors on action taken at Engineering Committee meetings and make recommendations as to how the Society can best support the efforts of the Committee.

NESC LIAISON

James Kearney
Brian James, Alternate

The Cable Television industry has been represented on the NESC Committee since the late 70's for the purpose of monitoring and contributing to the code writing process. It has been the practice of NCTA representatives to report on the activities of the NESC and to support the interests of the Cable Television industry throughout the code writing and interpreting process.

UPDATE

Initial Change Proposals to the 1987 NESC are to be Published April 15, 1988.

In November and December, 1987, the first of two series of NESC Subcommittee meetings were held to solicit changes to the 1987 NESC and to record the proposed changes. Change proposals have been submitted for all sections of the Code. This includes sections on Purposes, Grounding, Clearances, and Underground, which are particularly important to the CATV industry. These changes are being printed and will be available to the public on April 15, 1988 for comments. Copies of the change proposal preprint can be obtained through ANSI or through the NESC office in New York after April 15.

Anyone may submit comments in writing, directed to the appropriate sub-committee. Deadline for public comments is September 30, 1988. A series of subcommittee meetings will be held to review and respond to all comments received. The responses will include the text of the subcommittee action and the minutes of the subcommittee meeting. Full details of the procedures for public comment will be made available with the change proposals after April 15, 1988.

Summary of Major Changes

- More than 150 change proposals have been made. An effort is being made to consolidate similar sections and simplify troublesome sections of the code. The new code will be "revenue neutral". This means that present users will realize little or no increased costs as a result of changes in the code.

- The proposed changes include rewritten clearance tables to reduce the extensive and confusing footnoting in the existing code. Changed Sections include 232, 233 and 234.

- Fiber optic cable is better defined. There have been efforts to allow fiber optic cable attachments at less than 40 inches below supply conductors. The 40 inch requirement will not change. Fiber may be defined as a Communications or Supply Class cable but this classification will be made dependant on the classification of the line's service and its maintenance personnel.

FUTURE ACTIVITIES

NCTA members are encouraged to suggest to the Engineering Committee any modifications or additions to the NESC that may be considered desirable for reasons of safety, economy or clarification. Proposals for changes will be submitted through the NESC representatives, with the advice and consent of the Engineering Committee. NESC representatives will continue to report on the code writing process.

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REPORTS NOT RECEIVED BY PRESS TIME

STANDARDS SUBCOMMITTEE

Michael F. Jeffers, Chairman

CHARTER

To determine the best method (or methods) for measuring parameters that can ascertain the proper operation of a cable system and to establish performance criteria for good engineering practice. Further, to publish this information in the NCTA Recommended Practices for Measurements on Cable Television Systems notebook.

NATIONAL ELECTRIC CODE LIAISON

James Stilwell
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SMARTHOUSE PROJECT LIAISON

Wendell H. Bailey, Jr.
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