communications/engineering digest

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25th NCTA ANNUAL CONVENTION

NCTA TECHNICAL AWARDS

CHANNELING

TRAPS

FABLES

april 1976
volume 2, no. 4

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the pioneer

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WTCG-TV

CATV ★76

National Cable Television Association
25th Annual Convention, April 4–7, 1976
Dallas Convention Center, Dallas, Texas

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opinion/editorial

Judith Baer, Publisher

The February SCTE/IEEE Conference on Reliability was a great success. Attendance was about 160, and people came from all over the country to take part in the two-day program. The sponsoring groups held the cost down to $55 for members and copy of the transcript was included in the cost, as were the luncheons and coffee breaks. The point of the event was educational rather than revenue-producing.

The November Western Cable Television Convention was also a success with its technical programs and registration, and for exactly the same reason. Technical people were able to register for the sessions and the exhibits—sort of a "no-nonsense/no frills" program. There were no transcripts of the technical sessions so the cost to attend was in the $30 range. Every session had at least 100 participants.

I presented a proposal to the NCTA Convention Committee in January for a similar "no frills" registration package to cable system technical personnel. SCTE members already receive a $50 discount, thanks to past efforts of Delmer Ports, NCTA Vice President of Engineering and SCTE officers. Full program cost of the show is $185; NCTA members and SCTE members may attend the entire show—luncheons, banquets, management and/or technical sessions for $135. I suggested that for $85 we could attend only the technical sessions, receive a copy of the transcript and enter the exhibit area. I think that we should have that option.

SCTE officers were aware of my proposal and approve of the idea. It was however, presented by a "private" individual—who cannot as yet afford to join NCTA as an associate member. (I will as soon as I pay my telephone bill!) I want the 25th Annual Convention to be a success, whether or not I belong to NCTA. I want as many bodies as the show as is humanly possible to crowd into the Dallas Convention Center. I want a huge turnout at the technical programs and a bunch of people on the floor of the exhibit area.

At this writing, no response of any sort has been received. At this writing, I have serious doubts that the idea will be adopted. And, at this writing, I think that I am mad!

The convention will be held in Texas. There are about 250 CATV systems serving about 660,000 subscribers in Texas. That averages out to over 2,600 subscribers/system/chief engineer/technical department. Using such averages, it seems safe to say that at least 250 people would stand a better chance of going to Dallas in April if the cost for registration is cut to $85. Multiplying $85 by 250 produces over $20,000 in added revenues to NCTA. No gamble is included because you don't have to guess how many people are going to eat rubber chicken for lunch—they're likely to be at the nearest McDonald's. It would cost the convention one transcript and three cups of coffee for each person who bought the "no frills" package. I specifically stated that if these people wanted to attend the Engineer's Reception, they'd have to buy a ticket for $5. I don't think that NCTA's Engineering Department should pick up the tab for us to drink and eat all the goodies!

I feel very certain that at least 150 people would respond to the gesture of a lowered registration fee, and I feel fairly certain that NCTA would gain a tremendous amount of goodwill by making the gesture. I am sure that the associates would like the increased audience.

It would appear that everybody might win by adoption of such a proposal. System operators would appreciate the savings; many individuals would be more inclined to attend on their own; exhibitors would have a larger audience: NCTA would make friends; the show would produce ten to twenty thousand dollars in additional revenues, (they could argue that point by saying that they might lose $12,000 if only the optional package was purchased by the technical people but that is not a real loss since the investment is minimal). The only person who might lose out is me. I stuck my neck out and made the proposal, and now I've gone and told you about it. I hope that does not jeopardize my rapport with NCTA. It shouldn't—but I might be termed a rabble rouser.

It seemed like a good idea at the time. My timing might be off! Maybe we can try again next year.

Judith Baer

scte comments

Bob Bilodeau, President, SCTE

IS SOMEONE TRYING TO TELL US SOMETHING?

The SCTE recently co-hosted a successful conference on CATV Reliability—a subject into which you could fold almost every other technical activity in cable. It was promoted with a normal amount of publicity, was well organized, and featured a strong array of speakers. The net effect was a large registration that could be classified as "purely technical types." At the NTCA convention in New Orleans, after sifting out exhibitors and those related to convention activities, the "purely technical registration" totalled less than one hundred—from a registration of thousands. Something is apparent from this. Technical types are not making the annual NCTA conventions.

The make-up of the registration at the NCTA convention is predominantly trade show oriented, manufacturers, consultants, exhibitors, and owner/operators and their key employees in management. It is traditional, however, for the NCTA, with some SCTE eye-opener support, to organize technical panel discussions, present papers on technical subjects and to seek exhibitors of technical hardware. However, I think the audience is still back home "keeping" the system.

This was not the case at the two-day Reliability Conference in Philadelphia. Registration was good from large distances, including Canada, but was also strong from the system technician level within the Northeast region. There are some conclusions that can be gleaned from this and perhaps some indicators for future direction.

If the intended audience is the chief engineer, chief tech, or technician, he is normally not found at the national convention, but does attend regional SCTE meetings and did attend the Reliability Conference. The reasons are mostly economic. The average system does not allocate funds to mail their technical people across the country to annual trade shows with attendent travel expenses and room accommodations—not to mention lost time on the system back home. The Reliability Conference on the other hand, was two days, could be reached by train, car, or bus within several hours in the northeast region, carried modest registration fees, and appeared to the local system owner-operator as a genuine technical bargain. If the trade is truly trying to reach the technical person at the system level, the NCTA Annual does not. The SCTE, via chapter activity, does, but even more so a quality regional technical program at modest cost, such as the recent Philadelphia Conference does.

The SCTE intends to sponsor the Second Annual Conference on CATV Reliability. Concurrently, the NCTA's technical program should be reevaluated to determine if it is serving the purpose for which it is intended. Analysis suggests that perhaps the NCTA should consider an annual technical program apart from the annual trade show, which has historically been a sales-oriented activity.

If a concern of exhibitors is technical people will not show up to evaluate their products, this might be off-set by exhibitors not having to compete with technical sessions for audience. Associates will then have more exposure to middle management, semi-technical types, who make the buying decisions anyway.

Bob Bilodeau

national affairs

Melvin N. Abramovich, National Affairs Editor

TELECOMMUNICATIONS COMMITTEE HEAD TO RETIRE

Senator John O. Pastore(D-RI) has announced his intention to retire at the end of his term. The Senator has been a long-term chairman of the Communications Subcommittee of the Senate Appropriations Committee which oversees activities of the FCC, writes legislation pertaining to communications, and confirms appointments to top government communications positions.

BRISKMAN ELECTED IEEE TAB CHAIRMAN

Robert D. Briskman was recently elected Chairman of the Technical Activities Board of IEEE and Vice President, Technical Activities, of the Institute. He has been Director Division III, Chairman of the Aerospace and Electronic Systems Society, Director of the National Telecommunications Conference, Chairman of EASCON Board of Directors, and Chairman of the IEEE Standards Board. Briskman was recently appointed Vice President, Fixed Systems of COMSAT General Corporation. Before joining COMSAT, he was with NASA, ASA and IBM. He was elected Fellow of the IEEE "for contributions to the development of communications satellite systems" and has been awarded the Commendation Medal by the U.S. Army and the Apollo Achievement Award by NASA. He received his BSE from Princeton and MSE from the University of Maryland.

PRESIDENT FORD APPOINTS SCIENCE COMMITTEES

President Ford has appointed two committees to study science and technology problems. Simon Ramo will head a group which will study contributions of technology to economic strength while W. O. Baker's panel will look into advances in science and technology which could have an impact on national policy in the next decade.

SENATE PASSES SCIENCE AND TECHNOLOGY BILL

The Senate has passed the bill which would reestablish a scientific presence in the White House and would provide for mechanisms whereby the technological community can make orderly inputs into the government decision-making process. The bill is similar in purpose, to a bill passed by the House late last year. The bill would create a small Office of Science, Engineering and Technology Policy in the White House consisting of a Director, who would be his scientific adviser, and up to four assistant directors. The bill would also establish a temporary Advisory Committee which would analyze the overall federal effort in science and technology, including the possible creation of a new Cabinet-level department. The Senate bill is supported by virtually all technical societies, and all former Presidential science advisers. The bill now goes to the House-Senate Conference Committee and the President is expected to sign the measure when submitted to him.

METRIC CONVERSION

The President has signed the Metric Conversion Bill of 1975 which provides for a national program to make the international metric system the predominant but not exclusive system of measurement in the U.S. The law establishes the U.S. Metric Board to coordinate voluntary conversion. The bill does not provide federal funds or other incentives to ease the costs associated with the change.

FEDERAL BUDGET FOR FISCAL YEAR 1977

The President's budget for FY77 totals $394.2 billion and includes $23.5 billion in federal research and development spending. Civilian non-space efforts will get 37% of the total while military R&D will get slightly more than half. The space program budget is $3.7 billion. Highest priorities for increases in civilian science are for energy and basic research. Basic research spending has declined by 23% in constant dollars since 1968. Colleges and universities would get $2.6 billion in FY77 research funds. The National Science Foundation budget is up 11% to $812 million. Total budget for energy is up almost 32% from FY76 with most of the spending to be done by ERDA with a budget of $5.3 billion. The budget slashes education appropriations by more than $1 billion.

MARSTEN CITED FOR ATS-6 CONTRIBUTIONS

Dr. Richard B. Marsten, Dean of City College's School of Engineering, has been cited as one of America's "Adult Educators of the Year" by the Committee on Social Justice of the National Association for Continuing and Public Adult Education. The award was made as part of the Association's International Women's Year observance, held in Chicago in November.

Dr. Marsten was cited for his accomplishments in directing the design, development, launch and use of the Applications Technology Satellite 6 for the National Aeronautics and Space Administration. The satellite, known as ATS-6, was the largest, most complex and powerful ever produced for applications of satellite communications and technology.

Dr. Marsten was Director of Communications and Data Management

Programs for NASA before he was named Dean of CCNY's School of Engineering on September 1.

ATS-6 was used over the United States from June, 1974 through May, 1975 to broadcast a collection of educational experiments for the benefit of the pubic. These included a series of experiments in the broadcasting of health and educational services to local populations spread over large areas. The series, supported by the Department of Health, Education and Welfare, successfully delivered graduate and professional training to in-service teachers in the Rocky Mountain States and the Appalachian region, as well as career education instruction to 20,000 junior high school students.

The series also demonstrated the feasibility of satellite broadcasting for healthcare education and the delivery of health services.

As a result of the project's success, a continuing series of experiments will be conducted by NASA with a new satellite, launched in January. A third series is in preparation. Currently, the ATS-6 is on loan to the Government of India for a year, supporting a nationwide experiment to deliver educational instruction and information on family planning, hygiene and modern agricultural methods to 5,000 Indian villages.

STANDARDS HEAD SHERR JOINS ANSI

Sava I. Sherr, who has been Director of Standards of the IEEE has been appointed Deputy Managing Director, Energy Programs, of the American National Standards Institute (ANSI), effective March 1.

Mr. Sherr will work with ANSI's new Energy Council to ensure timely development of standards most urgently needed to meet the energy crisis.

Mr. Sherr had a long career in industry in an executive capacity before joining IEEE where he helped develop the Institute as the leading organizational source of standards in

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CCTA **canadian column**

Kenneth Hancock, Director Engineering

SATELLITE COMMUNICATIONS IN CANADA

With the current upsurge of interest in pay cable linked with use of U.S. communications satellites by the cable industry, this is perhaps a good time to review Canada's satellite communications position.

Satellite communications in Canada are the responsibility of two organizations. All international satellite communications, with some specific and minor exceptions, are the responsibility of Teleglobe Canada. All domestic satellite communications, and certain specific and limited satellite communications with the U.S., are the responsibility of Telesat Canada. As at this time the cable TV industry in Canada is not considering overseas satellite communications activity, this review deals only with activities interfacing with Telesat Canada.

Telesat Canada Background

In 1969, by an Act of Parliament, Telesat Canada was incorporated as a private company to establish a domestic satellite communications system for Canada. Although a commercial company with profit responsibilities to its shareholders, Telesat's Letters Patent provides for joint ownership by the Federal Government of Canada, the Canadian Telecommunications common carriers and the general public. Currently public equity has not been generally issued; it being represented by a single share held by the president, Mr. Dave Golden.

Telesat emerged as a complete operating entity in late 1972 when ANIK I, the world's first domestic communications satellite, arrived at its assigned location in geostationary orbit some 22,300 miles above the equator.

The original objectives of Telesat gave the company an exclusive mandate to operate a commercial satellite telecommunications system, providing services between locations in Canada. It was subsequently determined that, under certain specific circumstances, provision of limited services beyond Canada might be mutually beneficial to Canada and other nations.

Specifically, these amendments enable Telesat to provide interim and/or supplementary services for common carriers in the U.S. and to develop services for resource projects in Canada's far north which may have operations in Alaska as well as links with Northern states bordering on Western Canadian provinces.

Currently, Telesat Canada operates three domestic communications satellites; all of similar design and each with twelve transponder channels, two of which are used as protection for the ten traffic carrying channels. The three

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NEW FROM GILBERT ENGINEERING

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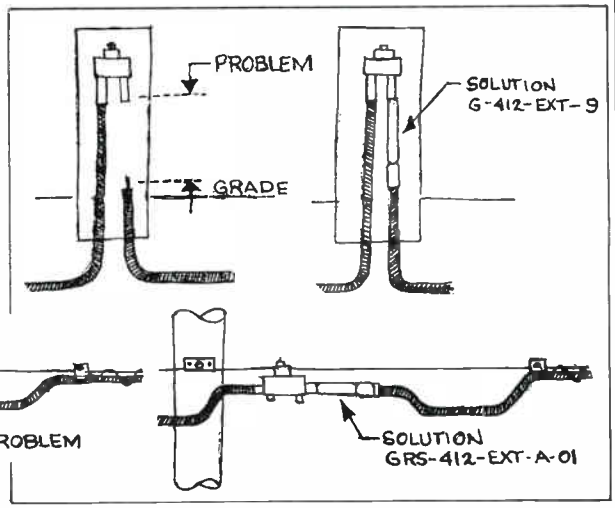

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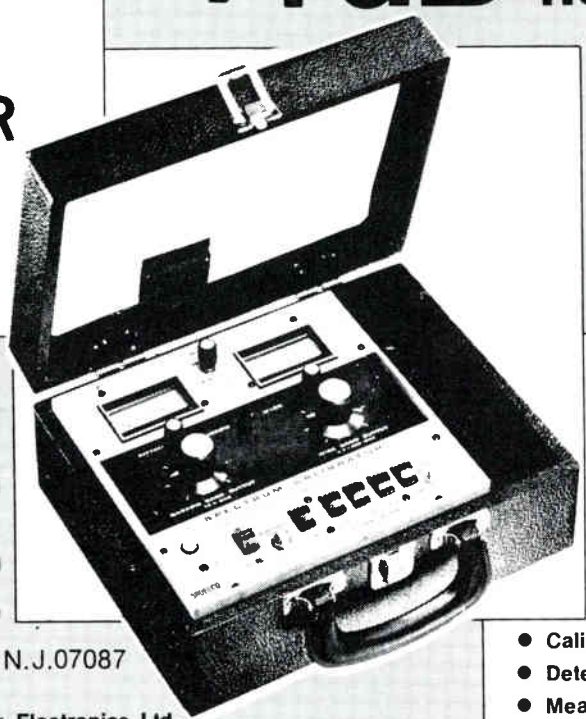

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ncta technical topics

Delmer C. Ports, Vice President, NCTA
Hazel S. Dyson, Administrative Assistant, NCTA

An Unlimited Subject

The subject of interference could be discussed endlessly. There are as many different questions relating to interference as there are people and things involved in radio frequency operations. And, here, I am using the phrase "radio frequency" in its broadest possible sense. The problem of interference is also one of long-standing. The original reason for forming the Federal Communications Commission, and before it the Federal Radio Commission, was to control interference rather than to regulate the various communication activities. In cable television, interference situations can all be dropped (or forced) into three major categories. These categories are first from, second to, and third within.

Interference from a cable television system is almost entirely, but not exclusively, from leakage. Interference to cable systems occurs in three possible manners. The first two are direct pickup manifestations: direct pickup at the headend into the antenna system or at the receiver into the tuner. The third method is by ingress to the cable system through coaxial cable or equipment housings. The third category, developing within the cable system, arises from intermodulation, cross modulation, hum and noise, Each of these classes is important, even critical, and deserves a full analysis and discussion. In this particular presentation, however, we will concentrate on only two. These are leakage and ingress.

The Mechanism

The same physical phenomenon is involved either in a leakage situation or an ingress problem. Analysts have frequently resorted to what they call the reciprocity theorem and they have honed this to a very sharp tool in analyzing the basic mechanics of stray signals.

In a cable system, under ideal circumstances, there are currents flowing both on the inside surface of a coaxial transmission line or housing of system components and on the external surfaces. They are generated by active circuits in the distribution system on inside surfaces and induced by electromagnetic fields on external surfaces. These currents normally flow independently of each other. On the transmission line, they are always longitudinal. On the housings, they are more random. Sometimes they are analyzable, but always they are consistent with the laws of nature.

There are many obstacles to this flow of current. These are in form of resistances, geometric shapes, corrosions and cracks. These create impedances that are partially resistive and inductive or capacitive. When these obstructions are common to both the inside and the outside surfaces of a transmission line or housing, leakage and ingress will occur. Corroded connectors, cracked or loose housings, loose connections between the transmission line sheath and connector shells, fatigue cracks in the outer sheath are all examples of sources of impedances common to the currents on both the inside and outside surfaces.

Since the current on the inside surface is a part of the normal operation and since the currents on the external surface, induced by electromagnetic signals, are nothing more than the everyday life, the only means left under our control to restrain these things is the treatment of the common impedance between these two surfaces.

Ingress From Citizens Band Operations

Analyzing ingress problems frequently is far from a process of reaching obvious conclusions. Usually, it requires all of the art of deduction that challenges even the best fictional detective. It frequently requires relating what seem to be unrelated circumstances.

We could pick any one of several dozen sources to discuss. This time, however, the operation of mobile and home citizens band operations is a good one to use. Recently, the incidence of problems has been growing so fast that it could become a new epidemic.

Citizens band operations are growing fast. Two- to four hundred thousand applications for licenses are received at the FCC each month. Judging by the comments and inquiries reaching us, the incidence of interference from them is either becoming more serious or proliferating through sheer numbers by the growth in sets in use.

Unfortunately, there are several possible mechanisms by which CB interference can intrude into a cable system. Apparently, the most likely source is ingress by the common impedance mechanism discussed above, which it is picked up by a cable system running past the location where a CB set is operating. Most cable systems are designed to carry Channel 2 and, therefore, without intentional filtering, will also pass 27 MHz signals without attenuation. In this way, a strong 27 MHz signal is presented to all TV sets downstream from the point of ingress. Some sets have sufficient selectivity in the tuner to cope with this problem. Most sets do not, however, and with any nonlinearity in the preamplifier stage, interfering signal components are generated that can degrade some, or even all, of the desired signals.

Another mechanism comes from faulty operation of the citizens band set itself. These sets can produce a strong second harmonic either through mistuning in an effort to maximize the

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news about people and products

1976 SCTE CHAPTER ACTIVITY AND CONFERENCE SUCCESS

The Society of Cable Television Engineers started the year with increased chapter activity and substantial membership growth. Since the beginning of 1976 SCTE has hosted ten meetings around the country, all with good attendance and programming of timely interest to engineering and technical personnel in the cable industry.

January schedules included meetings in New York City, NY (Central Atlantic Chapter); Cumberland, MD (Appalachia-Mid/Atlantic Chapter); and Monterey, CA (No. California-Monterey Sub Chapter). Topics of these meetings were Pay-TV Security Devices, FCC Test Requirements and Signal Propagation.

February saw the successful 1st Annual CATV Reliability Conference co-sponsored by SCTE and the Philadelphia Chapter of IEEE with 170 people participating in the two-day gathering. Seventeen papers were presented during the conference. (See story in this issue of **c/ed**.) Additionally during the month, the North Central Chapter held a meeting Feb. 6 and 7 in Milwaukee, WS. Representatives speaking at the meeting included personnel from RCA/EIE; Scientific-Atlanta; Comm/Scope; Theta-Com and Tektronix. According to Glenn Chambers, newly elected secretary-treasurer, each representative gave an excellent presentation. The group elected officers: president, Everett Burrows; vice president, Don Arndt and secretary-treasurer, Chambers. State directors were elected from 11 states covered by the chapter.

The Appalachia Mid/Atlantic chapter held its February meeting on 2-25 in Frederick, MD with Warren Braun speaking on "Radiation." For its meetings in the future, this active chapter programmed "Earth Stations" for March 31 and April will address converters.

Other meetings in March included the Western PA Chapter get-together on March 10, a meeting in Jackson MS on March 20 and a meeting in San Jose CA, also on March 20.

For an application for membership in SCTE, fill out the Reader Service Card in this issue of **c/ed**.

TIMES NEW CATV CABLE CATALOG

Times Wire & Cable Co. announces availability of their newest, full-line catalog for Trunk, Feeder and Drop cables. According to both Ray Schneider, Vice President of Times' CATV Products, and F. F. (Bud) Desmond, Director of Marketing for Times' CATV Products, this new catalog is a complete single source for all specifications of Times' Dynafoam, Alumifoam, II Drop Cables and Specialty Cables.

"Probably the most significant element of this new catalog," says Desmond "is that we have expressed the specifications in both the Metric and American Standard equivalents. It includes all Times' CATV Cables in one easy-to-use book detailing all important electrical performance characteristics, mechanical parameters and Attenuation vs. Frequency graphs, for all cables.

For a copy of Times' new Cable Catalog Circle Reader Service Card No. 111.

WESTERN ELECTRIC CONTRACTS WITH ANTENNAS FOR COMMUNICATIONS, INC.

A contract has been signed between Western Electric Purchasing and Antennas for Communications, Inc., Plymouth, MA. To supply conical horn reflector antennas to Western Electric Co. for the next 18 months as ordered.

Antennas for Communications manufactures conical horn reflector antennas in 7, 8, and 10-foot apertures for terrestrial microwave and small aperture earth station satellite communications systems.

Major customers include Western Electric, AT&T Long Lines, Bell Operating Companies, Bell Canada, Southern Pacific Communications, RCA, American Satellite Corporation, and Western Union. (Circle Reader Service Card No. 112.)

BIDDLE PNEUMATIC GLOVE TESTER

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communications/engineering digest

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BARBARA HILL

news continued

THETA-COM NAMES BERNARD SIGMON MICROWAVE ENGINEERING MANAGER

Bernard E. (Bernie) Sigmon of Phoenix has been named microwave engineering manager of Theta-Com, a subsidiary of Hughes Aircraft Company.

Sigmon will supervise Theta-Com's staff of microwave engineers in design and development of the firm's AML line of equipment.

Sigmon brings over 15 years of microwave engineering experience to his new post.

Before joining Theta-Com as a staff engineer last year, he was senior engineer with Omni-Spectra, Inc. of Tempe, AZ, and had previous experience in research and development with Sperry Microwave of Clearwater, FL, and field engineering with International Telephone and Telegraph Corporation.

Sigmon holds a Master of Science Degree in electrical engineering from the University of South Florida in Tampa.

HBO OPENS THREE REGIONAL OFFICES

Home Box Office, Inc. opened additional regional offices in March headed by managers with extensive cable television management and marketing experience.

Appointed managers of the new regions are Leslie H. Read, Northeast; Albert E. Jones, Southeast, and William G. Hooks, South Central. Read will be headquartered in New York City, Jones at West Palm Beach, FL, and Hooks at Dallas, TX.

Donald E. Anderson previously was named Western manager for HBO with offices in San Francisco beginning last month.

The regional expansion was announced by Paul M. Eisele, vice president, marketing, who said:

"In the past five months, HBO has grown from a concentration of Northeastern cable systems to a network with affiliates served by domestic satellite in 14 additional states. Experienced regional managers in each area of the nation will enable us to provide local marketing and promotion support and to ensure our continued orderly expansion."

FCC COMMON CARRIER BUREAU REORGANIZED

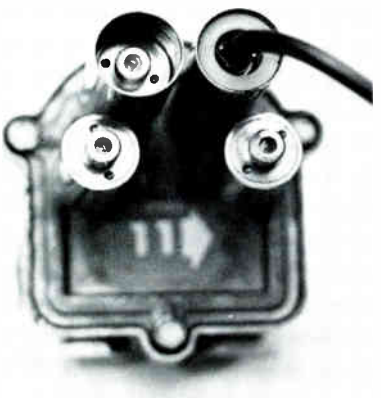
The Commission has approved a reorganization of the FCC Common Carrier Bureau to facilitate carrier surveillance and policy development and to improve program coordination. The reorganization was effective February 11.

The new structure is built around seven divisions and two staff groups. The divisions are Policy and Rules, Tariff, Facilities and Services, Mobile Services, Economics, Accounting and Audits, and Hearing. The staff units

are the Program Evaluation Staff and the International Programs Staff.

EAGLE NOTCH FILTER

Andrew F. Tresness, president of EAGLE Com-Tronics, has announced availability of their Model 1-NF notch-filter trap for pay TV applications.



EAGLE Notch Filter

The trap is produced for channels 2 thru 7, including midband, is made of machined, nickel-plated brass and its printed circuit assembly is completely potted. The 1-NF boasts an on-carrier notch depth averaging -55dB, adjacent carrier attenuation of less than 2dB and unusual temperature stability.

EAGLE's trap appears to be extremely rugged and is optionally available with a unique security shield and special installation tools. Tresness relates, "When we set out to design this product, we wanted to avoid problems like handling damage, sometimes done before installation, and to provide better electrical characteristics and mechanical packaging than we'd seen; all at a competitive price. It seemed nearly impossible at first, but we've done it."

In addition to its other apparent virtues, the EAGLE notch-filter fits most four-way multitaps without physical interference and seems enough to keep all but the most determined thief at bay. (Circle Reader Service Card No. 27.)

U.S. COURT RULES FCC MAY NOT REGULATE INTRASTATE NON-VIDEO CABLE TV

The United States Court of Appeals for the District of Columbia Circuit has set aside the FCC's pre-emption of state and local regulation of two-way, intrastate, non-video cable transmissions.

(At the present time two-way systems use a rudimentary transmission technology for a non-voice return capability useful for such services as burglar alarm systems, surveys, marketing services, educational feedback, etc. Content of transmission is usually under the customer's control.)

The action came in response to a petition by the National Association of Regulatory Commissioners (NARUC) for review of a portion of an April 15, 1974, Commission order denying reconsideration or modification of its earlier clarification of cable

continued on page 18

news continued

television rules and proposed rule-making inquiry.

NARUC's petition to the court objected to the Commission's pre-emption of state common carrier regulation over use of cable system leased access channels for two-way, point-to-point, non-video communications.

Communications of this type utilize cable lines for transmissions traveling in the opposite direction from cable television signals. This converts the network into a two-way system.

It was in the April 15 order that the Commission again made reference to preemption of all regulation of any two-way, intrastate, non-video communications carried over a cable system.

NSF PICTURE QUALITY STUDY

Measurement of Cable Television Picture Quality is the subject of a research grant of $208,000 by the National Science Foundation to the University of Missouri-St. Louis, carrying out a recommendation of CTAC.

Psychometric testing procedures designed by Robert E. Welch, Jr., of the University of Missouri and principal investigator for the project, will measure viewer's perception of TV picture quality in presence of random noise, intermodulation, synchronous cross-modulation, and discrete frequency interference separately and in various combinations.

Except for random noise, these effects have not been previously investigated in a rigorous manner, according to Archer S. Taylor of Malarkey, Taylor and Associates, and engineering consultant, coordinating the project.

Research results will be used by both industry and the FCC in formulating guidelines for technical performance specifications. Stimulus pictures for the magnitude estimation phase of the viewing tests will be recorded in split-screen format on 2-inch video tape. For the metric triad phase, based on multi-dimensional scaling techniques, the same picture with three different levels of picture quality will be displayed side by side on three monitors.

A special computer program is being developed by Evans Wetmore of Public Broadcasting Service to adjust a set of programmable attenuators which will accurately adjust the degree of impairment. Don Fink, executive consultant to IEEE is Chairman of the Project Advisory Board whose members are Stuart L. Bailey, Jansky & Bailey; Delmer Ports, NCTA; Harry Fine, FCC; Edwin J. Breneman, Eastman Kodak, and Forest Young of the University of North Carolina Psychometrics Laboratory.

NEW ULTRA-STABLE AURAL CARRIER FOR EARTH-STATION REAR-HAUL

Farinon Electric is introducing an ultra-stable (±200 Hz) 4.5 MHz aural

carrier package as a new option available with its FV41 FM Transmission Channel System.

The new equipment was developed primarily for U.S. earth-station rear-haul applications, to combine video and program audio signals and transmit them from the earth-station receiver over multi-hop microwave paths to the cable headend.

Particularly significant features include frequency stability, an order of magnitude better than has been available in commercial equipment, and the diplexing scheme.

The phase and amplitude-equalized diplexer unit includes low-pass filtering to remove noise above 4.2 MHz. Such filtering is essential to desirable performance as earth stations operate with low signal-to-noise ratios. The 4.5 MHz transmitter also meets all FCC requirements for deviation, emphasis, distortion and S/N ratio.

The diplexer and transmitter units plug into two spaces in the FV41 equipment shelf, which occupies one vertical rack-mounting space, and operate from 115/230 VAC or -24/48 VDC.

The new equipment also provides for an additional FM channel for transmitting status or alarm information. (Circle Reader Service Card No. 114.)

BELDEN NAMES WILMOT FIELD SALES MANAGER

Willard J. (Bill) Wilmot has been named a field sales manager for Belden Corporation's Electronic Division. Announcement of the promotion was made by Michael J. LaPorte, vice president-sales.

In his new post, Wilmot will supervise Belden's field sales force serving electronics distributors and OEM's in six Ohio River Valley states from western Pennsylvania to eastern Missouri. He will be based at the main offices of the Electronic Division in Richmond, Ind.

Prior to this appointment Wilmot was manager of CATV sales for Belden. "His ability to organize and develop divisional sales efforts and bring Belden CATV cable products to a position of leadership in a very competitive market, have earned him this new opportunity in field sales management," said LaPorte.

LaPorte added that sales development activities for CATV and related television markets continue as one of Wilmot's ongoing sales management responsibilities.

Wilmot joined Belden as a sales trainee in 1966. He subsequently spent six years as a field sales representative in the greater New York City area before being named CATV sales manager in 1974. Wilmot is an associate member of the Society of Cable Television Engineers. He attended Michigan State University and served four years as a sonar technician in the U.S. Navy.

Belden Corporation's Electronic Division manufactures a wide range of wire, cable, and cord products for selected electronic markets at plants in Richmond and Monticello, Ky.

Willard J. (Bill) Wilmot
Field Sales Manager
Electronic Division
BELDEN CORPORATION

NEW MATERIALS MANAGER AT THETA-COM

John Roser of Phoenix has been appointed Manager of Materials for Theta-Com, a worldwide producer and marketer of cable television and microwave equipment. Roser will direct all

continued on page 44

PAY THIS

Direct Mail Sales Cost Estimate

10,000 Pieces of Direct Mail
Three Mailings a Year

Description	Est.	Extension
Labels, purchase	S.10 ea.	S1,000.00
Printing Costs		
Envelopes		
Inserts		
Reply Cards		
TOTAL	.05 ea.	500.00
Addressing and Stuffing, Labor	.015 ea.	150.00
Postage		
Outgoing, 3rd Class		
9,000 Domestic	.077 ea.	693.00
1,000 Canadian	.13 ea.	130.00
Incoming Replies		
Est. 100 min. @	.11 ea.	11.00
Total for One Mailing		S2,484.00
Total for Three Mailings		S7,452.00

OR THIS

We've Got The Deal For You!!!

We have the audience!
We have the postage paid reply card! (we pay postage)
We have the labels! (costs you nothing)
We have the space!
We are doing the job!

We will deliver the message, every month for a year, for fewer dollars. More than 10% fewer.

Don't hassle with mailing lists *and* labor costs, *and* postage *and* handling. Advertise with

communications/engineering digest

FOR RATES & RESERVATIONS,
CALL (703) 892-2450
OR CIRCLE READER
SERVICE CARD NO. 4

National Cable Television Association

25th ANNUAL CONVENTION

APRIL 4–7, 1976
Dallas Convention Center

sunday
APRIL 4

11:00 am–7:00 pm
REGISTRATION
Main Lobby

11:00 am
SNEAK PREVIEW OF EXHIBIT HALL

1:30 pm
GRAND OPENING
Parquet Ballroom
Guest Speaker
MIKE WALLACE, CBS TELEVISION

4:00 pm–7:00 pm
EXHIBITS OPEN
Grand Hall, Level Three

★ **3:00 pm–5:00 pm**
SCTE ANNUAL MEETING
Dallas Convention Center
Rooms N224 & N227, Level Two

5:00 pm–6:00 pm
EXHIBITORS' RECEPTION
Grand Hall

NCTA ENGINEERING DEPARTMENT
Delmer C. Ports
Vice President—Engineering
Hazel S. Dyson
Technical Program Coordinator

PARTICIPATING ORGANIZATION
Society of Cable Television Engineers
Robert Bilodeau, President

Visit SCTE in the Engineers' Lounge
Room N228–229 Level Two

EXHIBIT HOURS

monday
9:00 am to 6:00 pm
tuesday
9:00 am to 6:00 pm
wednesday
9:00 am to 12:00 noon

monday
APRIL 5

★ **8:00 am–9:30 am**
TECHNICAL PROGRAM EYE-OPENER

VALUE ENGINEERING AND ZERO DEFECTS
N230 & N231, Level Two

Moderator/Organizer
ROBERT BILODEAU
Surburban Cablevision

Guest Speaker
Philip B.Crosby, *ITT*

Panelists
James Palmer, *C-COR*
Ken Gunter, *UA-Columbia*
Grady Perkins, Jr., *Community TV System Inc.*
Sruki Switzer, *Switzer Engineering Services*

10:00 am–11:45 am
NCTA TECHNICAL SESSIONS

I—SATELLITE CABLE INTERCONNECTION
N224 & N227, Level Two

Chairman
DR. RICHARD B. MARSTEN
The City University of New York
MULTIPONT DISTRIBUTION OF SATELLITE RECEPTION
Stanley P. Lapin
Microband Corporation of America
THE RANGE OF VIDEO AND RADIO PROGRAM DISTRIBUTION OPTIONS VIA SATELLITE
Isadore Lieberman, *Western Union*
CABLE AND SATELLITES: NEW OPPORTUNITIES FOR SERVICE
Frank W. Norwood, *Joint Council on Educational Telecommunications*
REGULATORY ASPECTS OF EARTH STATION LICENSING
Hubert J. Schlafly
TransCommunications Corporation

SPACE TELECOMMUNICATIONS:
THE FUTURE IS NOW
Albert A. Whalen
Goddard/Space Flight Center
FUTURE BROADBAND COMMUNICATION:
A USER'S POINT OF VIEW
John P. Witherspoon
Public Service Satellite Consortium

10:00 am–11:45 am

II—RULES, TESTS & MAINTENANCE
N222 & N223, Level Two

Chairman
FRANK BIAS
Tele-Vue Systems

UNATTENDED CATV MEASUREMENTS
FOR SYSTEM MAINTENANCE AND
PROOF OF PERFORMANCE
Albert Helfrick
Kay Elemetrics Corp.
George Fenwick
Telecommunications, Inc.
PRACTICAL ROUTINE MAINTENANCE
Thomas J. Polis
Magnavox CATV Div.
SOLVING INGRESS PROBLEMS
OF FOREIGN SIGNALS
Walter Gerber
Guam Cable TV System
WAVEFORM TESTING
Vic Nicholson
Cable Television Information Center
FCC TECHNICAL STANDARDS
Dr. Robert Powers
Federal Communications Commission

12:00 n–1:30 pm
LUNCHEON
Parquet Ballroom

Speaker
RICHARD E. WILEY
Chairman, Federal
Communications Comm.

6:00 pm–8:00 pm
ENGINEERS RECEPTION
The Statler Hilton
Embassy Garden Ballroom

Presentation of
Technical Achievement Awards

tuesday
APRIL 6

★ **8:00 am–9:30 am**
SCTE EYE-OPENER
WORKSHOP

ALPHA-NUMERICS IN CABLE
(Non-standard video formats)
N224 & N227, Level Two

Moderator
STEVE DOURDOUFIS
Vision Cable
Panelists
James Dalke, *Metro Data*
Lyle Keys, *Telemation*
Robert Dickinson, *E-Com*
Robert McAll, *Vital Industries*
Donald Lolli, *Catel*

8:00 am–9:30 am
NCTA SUNRISE SESSION

DESIGNING RELIABLE SYSTEMS
N222-223, Level Two

Chairman
G. C. KLEYKAMP
UA-Columbia Cablevision

COMPUTER-AIDED ANALYSIS OF
COXIAL CABLE ATTENUATION
AS A FUNCTION OF
FREQUENCY AND TEMPERATURE
Dr. Jacob Shekel & Eric Winston
Jerrold Electronics
OPERATIONAL EXPERIENCE WITH AN
AUTOMATED CATV SYSTEM ANALYZER
AND STATUS MONITOR
Jans Kliphuis
Intech Laboratories
EQUIPMENT DESIGN CONSIDERATIONS
FOR RELIABILITY OF CABLE
TELEVISION DISTRIBUTION SYSTEMS
James R. Palmer
C-COR Electronics

10:00 am–11:45 am
NCTA TECHNICAL
SESSIONS

I—ADVANCED TECHNIQUES
N224 & N227, Level Two

Chairman
JOE STERN
Stern Telecommunications

AMPLIFIER LINEARIZATION BY
COMPLEMENTARY POST PRE-DISTORTION
A. Prochazka, P. Lancaster and
R. Neumann, *Delta-Benco-Cascade*
COMMUNICATIONS APPLICATIONS
OF FIBER OPTICS, Dr. W. M. Caton
TRW Defense and Space Systems
and Dr. D. J. Albares
Naval Electronics Laboratory Center
SHF—NEW QUALITY FOR CABLE TV
I. Switzer, *Switzer Engineering Services Limited*
BODE'S VARIABLE EQUALIZER
Donald E. Groff
Jerrold Electronics

10:00 am–11:45

II—TWO-WAY AND AUXILIARY SERVICES
N222-223, Level Two

Chairman
NICK WORTH
TeleCable Corporation

A LOW COST INTERACTIVE
DATA TERMINAL FOR CATV
D. Stevens McVoy
Coaxial Scientific Corp.
TRANSMISSION OF HIGH-SPEED
PCM SIGNALS ON CATV SYSTEMS
F. F. Reed, *GTE Sylvania*
and G. O. Shelton, *GTE Lenkurt*
TWO-WAY IS ALIVE AND WELL
Donald T. Rozak, *TOCOM*
CABLE TELEVISION & ITS ROLE
IN COMMERCIAL DATA TRANSMISSION:
A CASE STUDY AT BANKERS TRUST CO.
Alan C. Maltz, *Bankers Trust Co.,*
Telecommunications Dept.

12:00 n–1:30 pm
LUNCHEON
Parquet Ballroom, Level Three

Speaker
ROBERT L. SCHMIDT
President

7:00 pm
NCTA 25th ANNUAL BANQUET
Fairmont Hotel
Grand Ballroom
Entertainment by
DANNY DAVIS
AND THE NASHVILLE BRASS

wednesday
APRIL 7

★ 8:00 am–9:30 am
SCTE EYE-OPENER WORKSHOP

PRACTICAL CONSIDERATIONS FOR TERRESTRIAL RECEPTION AND DISTRIBUTION
N224 & N227, Level Two

Moderator
GLENN CHAMBERS
American TV & Communications
Panelists
Robert C. Tenten
Home Box Office
A. W. Brook
RCA Global Communications
Dan Yost, *Compucom Inc.*
Albert K. Fowler, *RF Systems*

8:00 am–9:30 am
NCTA SUNRISE SESSION

PAY TV
N222 & N223, Level Two

Chairman
RICHARD HICKMAN
Cox Cable Communications

DESIRED SPECIFICATIONS ON PAY CABLE TRAPS
Dan Pike, *United Cable Television*
THICK FILM TECHNOLOGY FOR PAY TV SECURITY: THE T.E.S.T. SYSTEM
Balazs Becht, *T.E.S.T., Inc.*
DESIGN CRITERIA: MULTIFUNCTION ADDRESSABLE TAP
Lewis D. Dumbauld, *Ameco*

10:00 am–11:45 am
NCTA TECHNICAL SESSION

ENGINEERING FORUM

Chairman
JAMES LAHEY
Muskegon Cable TV

Engineering Advisory Committee Members
Frank Bias
Tele-Vue Systems, Inc.
Robert A. Bilodeau
Suburban Cablevision
Robert A. Brooks
Telecom Engineering Inc.
Jack D. Cauldwell
Arvin Systems
Caywood C. Cooley
Philadelphia Comm. Corp.
Robert V. C. Dickinson
E-Com Corp.
Kevin Gossman
TelePrompTer Corp.
Robert L. Grant
Magnavox Consumer Electronics
Richard Hickman
Cox Cable Communications
E. M. Hinsdale
RCA Consumer Electronics
Terry L. Hulseberg
American TV & Communications
Michael P. Jeffers
Jerrold Electronics Corp.
Nate Levine
Sammons Communications Inc.
James A. Luksch
Texscan Corporation
Henry Marron
Scientific-Atlanta, Inc.
Herbert P. Michels
Radio Station WKMB
O. D. Page, P.E.
Consulting Engineers
John Pranke
Theta-Com of California
Joseph L. Stern
Stern Telecommunications
James W. Stilwell
Communications Properties, Inc.
Nick Worth
TeleCable Corporation

Liaison Members
Ralph Clark
IEEE Liaison IEEE Office
Kenneth E. Hancock
Canadian Liaison, CCTA
Dr. Robert Powers
FCC Liaison, Cable TV Bureau
A. M. Rutkowski
FCC Liaison, Cable TV Bureau
Delmer C. Ports
NCTA Staff Liaison, NCTA

12:00 n
LUNCHEON
Parquet Ballroom

Speaker
GOV. JOHN CONNALLY
Vinson, Elkins, Searls, Conally & Smith

NCTA Outstanding Technical Achievement Awards

1973

DONALD W. LEVENSON
President
Wheeling Antenna Co., Inc.

Don is well known in cable operations. He has been president of Wheeling since 1952, with a subscriber count of nearly 11,000 in Wheeling, W. Va. He is a graduate of the Carnegie Institute of Technology with a Bachelor of Science in Electrical Engineering. Prior to developing the Wheeling system, Don was employed by RCA in the 1940's in the Test and Measuring Equipment Design Department. Later he was involved in the Teleran Aerial Navigation and Traffic Control Project at RCA. He is co-author of several technical papers at RCA.

Don is a licensed professional engineer in the State of West Virginia and in the State of New Jersey. He holds memberships in SCTE, SPE, West Virginia Society of Professional Engineers, IEEE and during 1973 served on the President's Committee on Employment of the Handicapped. He went through the grades of student associate and member of IRA/AIEE, joining in 1937.

He holds several patents in the test equipment field. Since establishing the Wheeling system, Don has designed special equipment and developed new methods of maintenance and control.

KENETH A. SIMONS
Consultant
Simons and Wydro Associates

Ken started working in radio in 1928, in television in 1939 and in cable television in 1951. He spent 25 years with Jerrold Electronics Corporation and played an active role in developing cable technology. He authored NCTA standards for noise interference and for the measurement of distortion components. His "A Technical Handbook for CATV Systems" remains an indispensable sourcebook on the technical aspects of CATV operation.

Ken is the author of several papers presented at NCTA conventions and participates actively in conventions on cable television in Europe. He recently presented another paper during the SCTE/IEEE Conference on Reliability in Philadelphia, PA in February.

Ken is a member of SCTE, IEEE and was chairman of CTAC Panel 1 on Measurements and Methods. He resigned from Jerrold to join Walter Wydro in forming Simons and Wydro Associates, consultants in the field of broadband communications.

1974

HUBERT J. SCHLAFLY
Chairman
TransCommunications Corp.

Hub Schlafly is a co-founder of TelePrompTer Corporation, served as a director from 1951 to 1974; as president in 1971–72; and Executive Vice President, Technological Development to his retirement in 1974. He was the chairman of the Cable Television Technical Advisory Committee to the FCC, an advisor to the Sloan Commission on Cable Communications and the National Academy of Engineers Telecommunications Committee.

Hub holds a BSEE from the University of Notre Dame, and attended post graduate courses at Syracuse University extension. He was director of Television Research at 20th Century Fox from 1944 to 1951 when TelePrompTer was founded. He is a Fellow, SMPTE; Senior Member, IEEE; active on EIA committees; a member of SCTE. He has authored many papers, lectured and holds patents in the field. He joined Robert Button, formerly of TelePrompTer, in forming TransCommunications in 1975, serving as consultants with specific expertise in satellite communications.

THOMAS M. STRAUS
Senior Scientist
Theta-Com

Dr. Straus has a responsibility of investigating advanced technology areas which impact on cable television. He holds a B.S. in Physics from the University of Michigan, an M.A. and Ph.D. in applied physics from Harvard University.

Before joining Theta-Com, Straus was with the Hughes Aircraft Co., parent company of Theta-Com, since 1959. He was the program manager at Hughes in development of AML microwave equipment for use in CATV systems. He has done extensive work in satellite space and ground station communications as well as laser range finder and communications systems. Dr. Straus has also been associated with the MIT Lincoln Laboratory.

NCTA, in a selection process assisted and coordinated through SCTE, designates two engineers to receive the NCTA Outstanding Technical Achievement Award each year at the national convention. These engineers are selected with regard to contributions that they have made to the progress of the cable television industry. One of the awards goes to an engineer who has been active and innovative in cable system operations, the other to an engineer who has provided a service through manufacturing, design or associated influences to the industry.

We are pleased to honor past winners and introduce the 1976 Outstanding Technical Achievement Award winners.

1975

H. M. DIAMBRA
President
DGA, Inc.

Hank Diambra has more than 20 years of experience in CATV. He serves as a consultant to Westinghouse Electric Corp., Headquarters Engineering, on matters relating to communications system business development, with particular emphasis on wired video systems. Hank has been active since 1950 in CATV and was a co-founder in 1952, president and director of engineering of Entron, Inc., a manufacturer of CATV electronic equipment whose subsidiaries included a system design and construction company, a television common carrier and a CATV operating division. During his association with Entron, Hank was granted nine patents covering cable television related developments. He was active in Entron's management as president until 1962 and Chairman of the Board until 1964, resigning to form and operate Clearview Cable and Micro-Relay, Inc.

He served as chairman of CTAC Panel 5 on Frequency Allocations; he is a member of the IEEE Subcommittee on Frequency Allocations of the Coordinating Committee for Cable Communications Systems. He is a member of SMPTE, SCTE, NAEB and serves as an advisor to the National Cable Television Institute.

ISRAEL SWITZER
President
Switzer Engineering Services Ltd.

Sruki Switzer entered CATV in 1954 and built the first CATV system on the Canadian prairies in 1955. Sruki has been intensively involved in cable television since that time. He was vice president, Engineering at Maclean-Hunter Cable TV Ltd., and currently provides engineering services to that firm, as well as many others through Switzer Engineering Services.

He served as director of the Canadian Cable Television Association for many years, is a registered professional engineer in the Province of Ontario and has been president of the Canadian Association of Broadcast Consultants. He serves as technical editor for a cable trade magazine and is a frequent contributor to CATV meetings in Canada, the U.S. and abroad.

1976

ARCHER S. TAYLOR
Consulting Engineer
Malarkey, Taylor and Associates

Archer Taylor, along with Norman Penwell and others, organized, built and operated the first cable television system in Montana, in Kalispell, in 1953. Archer also, along with Martin F. Malarkey, is a co-founder of Malarkey, Taylor and Associates. The firm was established in 1966 to provide services to the CATV industry.

Archer was one of the original organizers of CTAC in 1972. He served as Assistant Technical Coordinator, Alternate Chairman of the Executive Committee, Treasurer of CTAC Fund, Inc., and Chairman of Panel 2 on Subjective Evaluation of Picture Quality.

He received a B.S. degree in Physics from Antioch College. In 1941 he served as a scientist for the National Bureau of Standards on the Artic expedition to conduct ionospheric soundings aboard the 100' schooner Effie M. Morrissey. He has been a broadcast engineering consultant since 1944.

He is a Registered Professional Engineer in the District of Columbia and Montana, a Senior Member of IEEE, and member of SMPTE, SCTE (United States) and SCTE (United Kingdom).

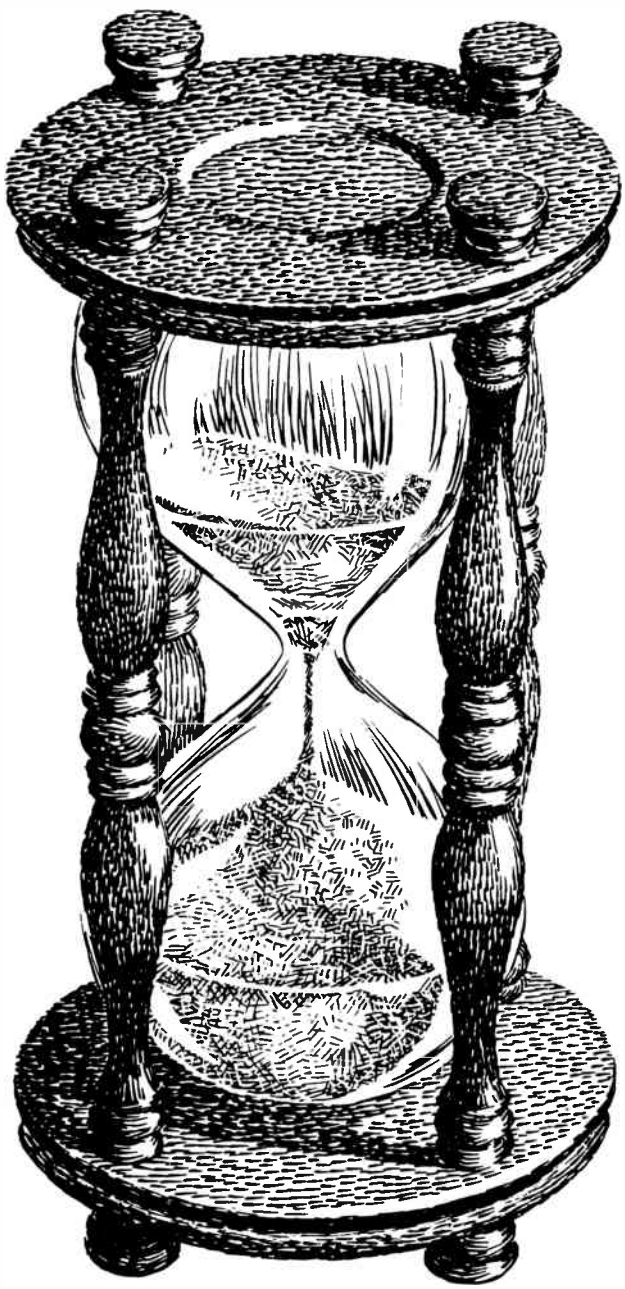
RICHARD C. HICKMAN
Vice President
Cox Cable Communications

Dick is a veteran of 23 years in the cable television industry. He joined Cox in 1964 as assistant to the chief engineer and was appointed vice president in 1975. Prior to joining Cox he spent eleven years with Fairmont TV Cable as Chief Engineer.

Dick has been active on many industry engineering committees and sub-committees of NCTA. He is a member of SMPTE, SCTE, and the American Society of Certified Engineering Technicians; is a Certified Senior Engineering Technician; was member of CTAC Panel 3 and currently serves on the Engineering Advisory Committee of the National Cable Television Association.

He is a native of Charleston, West Virginia and attended the U.S. Navy Electronics School, the National School of Radio Television, Cleveland Institute of Electronics, RCA Color Television School and Fairmont State College.

A short history and review of television allocations indicates it may be time for some new thinking.



Even a cursory examination of the RF spectrum presently allocated to television broadcasting will quickly remind the observer that it covers a lot of valuable electronic real estate—492 MHz in all. It also becomes apparent that the present plan is a quarter of a century old—old enough to stand a little examination in the light of 25 years of change.

Conceived as a compromise to off-set earlier plans which had seriously underestimated the number of viable television stations needed to supply national coverage, today's allocation plan was intended to create a sturdy and effective web of local stations to provide the means for truly local expression. VHF was bedrock; UHF, the expansion potential. That it has not really worked as planned is not necessarily reflective of a technological faux pas. The economics of station operation have been intricately interwoven into the evolutionary pattern of the last twenty-five years. After all, when the schemata for national television was being developed, UHF above 450 MHz was a region for experimentation; cable television was unknown; and the vacuum tube reigned supreme. "Solid state" was then an expression for the condition of the economy and a frame of mind.

Times do change; and somehow much more rapidly than the clock alone would indicate. The shortcomings of the original allocation plan are evident in the very obvious imbalance between VHF and UHF station operation; in the serious VHF co-channel interference problems which affect many viewing markets; and in the number of UHF taboos which afflict the TV receiver manufacturer as well as the broadcaster.

Cable Television

Cable television has become an element of permanent change. Fostered principally by the tour year freeze of 1948–52, it is now an entrenched part of the broadcast system. And, should the ancillary services which have been blue-skied for the past decade prove viable in the free market place, cable may relegate open circuit broadcasting, which spawned it, to second place.

For practical purposes, the low power vacuum tube in communications is dead and "solid state" is now not only a functional replacement but a new way of life. Circuits and functions not even contemplated for laboratory use in the heyday of the vacuum tube are now being considered for

use in home appliances. The IC and LSI have made commonplace what only five years ago would have been extolled as engineering feats. Digital electronic techniques make possible the generation, measurement and control of signal currents to an order of accuracy and stability once reserved for primary standards.

The time has come, perhaps, to reexamine the existing allocation plan in light of the current technological status and the economics of change.

The freeze of 1948–52 produced the phenomenal growth of cable television systems. They were originally intended to extend a station's coverage and to provide additional services where only minimal off-air signals existed. At a time when UHF broadcasting was only an experimental test bed, the viable spectrum plan consisted essentially of twelve VHF channels. Since most cable systems were then considered transient phenomena, system designers opted for the only spectrum plan available—namely the existing VHF broadcast plan. By developing techniques for adjacent channel operation, the industry provided more than an adequate number of channels to satisfy nearly all service requirements, although a number of deficiencies in picture quality were even then being noted. By and large results weren't too bad and the cable industry grew and prospered. Broadcasters were generally in favor of the additional coverage benefits and the status quo was maintained for nearly two decades.

Murphy's Law Prevailed for Awhile

However, when complacency sets in, Murphy's Law acts inexorably and with bewildering speed. In this case, a number of not too subtly related events converged to produce some deep seeded changes in the cable industry.

For openers—in the early sixties, cable entrepreneurs made a determined bid for the major markets; a development which did not produce a too kindly set of reactions from the broadcast fraternity. The cable freeze of 1968–72 was the result.

Post-thaw signal carriage conditions imposed upon new cable systems, and to a great degree on the existing systems grandfathered by FCC fiat, produced an immediate need for system designs with considerably more than twelve channel capacity. It became readily apparent that no acceptable standard plan existed which could accommodate

Television Channeling Plans— The Work of CTAC Panel 5

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the 20, 35 or even 50 channels needed in some markets to fulfill FCC requirements. The need for a truly broadband (5–300 MHz) spectrum plan produced much more than an intellectual debate.

The deficiencies of the existing situation became glaringly obvious:

(a) Cable systems did not generally operate at UHF. Forecasts for operation up to 1 GHz placed this feasibility at not less than a decade in the future. Some skeptics said never; fiber optics might then be more viable than coaxial cable.

(b) Present broadcast VHF accommodates only twelve channels, although modern cable system design provides capacity for 35 channels; FCC fiat mandates at least 20.

(c) Millions of TV receivers in everyday use were designed for only twelve VHF channels. Many did not work too well when presented with adjacent channels. The interface with broadband cable dictated an intervening outboard converter—or new TV set design.

(d) Signal service to metropolitan communities accustomed to top quality, off-the-air reception dictated comparable low distortion pictures from cable systems. A cable spectrum channeling plan derived from the existing broadcast plan proved to be a major culprit in creating built-in distortion products which seriously limited system size and channel capacity. The anomaly of channels 5 and 6 produced hundreds of in-band beats and made certain channels unusable.

Moreover, there was no consensus within the cable industry as to an appropriate spectrum management plan for a broadband cable service. Since the cable spectrum from 108–174 and 216–300 MHz had never undergone extensive field use, a considerable amount of development was going to be necessary to ascertain what might be the best plan for its management. Even more importantly, the realization dawned that signals carried within the cable system bore no relationship to the spectrum allocations dedicated to the great variety of broadcast public services. Air navigation and communication, public transportation and law enforcement, telemetry, common carrier mobile and fixed services are but a few of the non-entertainment uses for radio crowded into the spectrum between and just above the VHF TV bands.

A shielded cable system should theoretically be insensitive to the outside RF environments. In practice, however, as every cable technician is aware, signal leakage into and out of operating systems is of serious concern. And even when the best of care is taken to operate RF-tight systems, the hundreds of thousands of interconnected, poorly shielded television receivers, provide amply pathways for excessive system radiation and ingress for destructive interference. The industry recognized a real and growing concern for radiation interference with other established services. Of great concern were the air navigation and traffic control frequencies.

Recognizing the paucity of engineering information available to system designers who wished to use the augmented VHF spectrum, the IEEE moved to create a professional committee to examine the problem. In January, 1971 the subcommittee on frequency allocation of the Coordinating Committee for Cable Communications Systems was formed to serve as an industry forum and to accumulate information. It considered nine configurations; analyzed four plans in detail and submitted an interim report (tutorial in nature) in May, 1972. No recommendations were made favoring a particular frequency plan although a general allocation plan was suggested (Table 1).

CTAC Comes on the Scene

CTAC was organized by the FCC during the summer of 1972 to serve as a conduit to provide the Commission with industry advice and recommendations on a number of technical issues. Panel 5 (of the nine created) was charged to:

"Evaluate possible frequency assignment plans for Class I and Class II cable television channels with due consideration for the following factors, among others, which may be added during the course of the study:

- **(a) TV receiver design**
- **(b) Compatibility with off-air reception and protection of the public investment in existing receivers**
- **(c) Cable transmission problems**
- **(d) Cost per user**
- **(e) Direct pickup interference**
- **(f) Interface adapter requirements**
- **(g) Allowance for Class II and IV non-TV channels."**

Quite a charge! Two years of deliberation among its twenty-three members produced an in-depth analysis of five plans and variants. At times, the panel found it quite difficult to separate the purely technical issues and address them independently of compromising economic considerations. Considerable attention was paid to the study of harmonically related carriers (HRC), a technique being field tested during the panel's life span.

Panel 5 also determined that insufficient data existed to produce meaningful recommendations for upstream channelling plans and thus concentrated its efforts on downstream television carriage.

TABLE 1

Frequency band (MHz)	Allocation	Possible Uses
Below 54	EXPERIMENTAL	Television Subscriber response signals Telemetry Facsimile Control of Monitoring signals
*54- 72	TELEVISION	Cable television, classes I and II
*72- 76	EXPERIMENTAL	Pilot signals Control signals
76- 88[1]	TELEVISION	Cable television, classes I and II
88-108[2]	AURAL BROADCAST	FM Broadcast signals AM Broadcast signals, remodulated to FM Local origination, FM
108-120	EXPERIMENTAL	Subscriber interrogation signals Control signals Pilot signals
120-174	TELEVISION	Cable television, classes I and II
*174-216	TELEVISION	Cable television, classes I and II
216-270	TELEVISION	Cable television, classes I and II
270-300	EXPERIMENTAL	Cable television, classes I, II and III Facsimile
300-400	EXPERIMENTAL	Cable television, class IV Telemetry Subscriber response signals Monitoring signals
Above 400	Not allocated	

*Present FCC Frequency Plan for VHF broadcast television service.
[1]Transitional modification would take place per Panel 5 recommendation affecting spectrum 76–78 mHz.
[2]Transitional modification would take place per Panel 5 recommendation affecting spectrum 88–90 mHz.

The five plans (Table 2) can be described briefly as follows:

Plan 1: Augmented FCC assignments with standard tolerances and offsets—28 channels
1A: Same expanded to 35 channels
Plan 2: Constant interval assignments based on a 6 N + 1.25 MHz comb—no offsets—precise visual carrier control—28 channels
2A: Same expanded to 35 channels
Plan 3: Harmonically Related Coherent (HRC) carrier assignments—6 N comb—28 channels
3A: Same expanded to 35 channels
Plan 4: A detailed channel plan based on Plan 1 which included specific assignments for pilots, data channels, upstream carriage—36 channels. The panel concluded the plan to be a specialized variant of Plan 1 and therefore not suitable for general adoption.
Plan 5: Essentially Plan 2 (2A) except that the Channel 5 and 6 anomaly in respect of a 6 N + 1.25 MHz comb would be resolved by moving Channels 5 and 6 up 2 MHz and accordingly relocating 2 MHz of the educational FM radio spectrum. The plan would be recommended for adoption by both broadcasters and cable systems.

TABLE 2

Channel	PLAN 1 (1A) Nominal FCC Visual Carrier	PLAN 2 (2A) Constant Interval Carriers		PLAN 3 (3A) Harmonically Related Carriers	
	MHz	n	[6n+1.25 MHz]	n	[6n] MHz
2	55.25	9	55.25	9	54.00
3	61.25	10	61.25	10	60.00
4	67.25	11	67.25	11	66.00
5	77.25	13	79.25*	13	78.00*
6	83.25	14	85.25*	14	84.00*
[A]	121.25	20	121.25	20	120.00
[B]	127.25	21	127.25	21	126.00
[C]	133.25	22	133.25	22	132.00
[D]	139.25	23	139.25	23	138.00
[E]	145.25	24	145.25	24	144.00
[F]	151.25	25	151.25	25	150.00
[G]	157.25	26	157.25	26	156.00
[H]	163.25	27	163.25	27	162.00
[I]	169.25	28	169.25	28	168.00
7	175.25	29	175.25	29	174.00
8	181.25	30	181.25	30	180.00
9	187.25	31	187.25	31	186.00
10	193.25	32	193.25	32	192.00
11	199.25	33	199.25	33	198.00
12	205.25	34	205.25	34	204.00
13	211.25	35	211.25	35	210.00
[J]	217.25	36	217.25	36	216.00
[K]	223.25	37	223.25	37	222.00
[L]	229.25	38	229.25	38	228.00
[M]	235.25	39	235.25	39	234.00
[N]	241.25	40	241.25	40	240.00
[O]	247.25	41	247.25	41	246.00
[P]	253.25	42	253.25	42	252.00
[Q]	259.25	43	259.25	43	258.00
[R]	265.25	44	265.25	44	264.00
[S]	271.25	45	271.25	45	270.00
[T]	277.25	46	277.25	46	276.00
[U]	283.25	47	283.25	47	282.00
[V]	289.25	48	289.25	48	288.00
[W]	295.25	49	295.25	49	294.00

*Special consideration has been given to these channels.
When moved up 2 MHz as indicated, the arrangement would be Plan 5.

TABLE 3. PRECISE FREQUENCY, PHASE-STABLE VISUAL CARRIER PLANS (CONSTANT INTERVAL BASE)

	On Cable Only		On Both Broadcast and Cable	
	Plan 2 (2A) (See Note 1)	Plan 2 (2A)	Plan 5 (See Note 1)	Plan 5
Channels 5 and 6 On Cable (Phase Stable)	77.25 MHz 83.25 MHz (See Notes 2 and 3)	79.25 MHz 85.25 MHz moved up 2 MHz	77.25 MHz 83.25 MHz (See Note 2)	79.25 MHz 85.25 MHz moved up 2 MHz
Channels 5 and 6 On Broadcast	77.25 83.25 MHz (Nominal FCC)	Same ←	Same ↑	Same ↑
Broadcast Carrier Frequencies	Nominal FCC Carriers	Same ←	2N + 1.25 MHz Comb (See Note 4)	6N + 1.25 MHz Comb (See Note 4)
Cable Carrier Frequencies	2N + 1.25 MHz Comb (See Note 5)	6N + 1.25 MHz Comb (See Note 5)	All Channels locked to Broadcast Carriers	Same ←

Note 1: Channels 5 and 6 not moved.
Note 2: Channels 5 and 6 will cause 2nd and 3rd order distortion products in visual passband of all channels. Option to delete Ch 5 and 6 on cable.
Note 3: On-channel broadcast pickup on either Ch 5 or 6 may cause beat between precise frequency cable channel and nominal FCC broadcast carrier (especially if offset). Option to delete either cable Ch 5 or 6 as necessary.
Note 4: Option to use individual station precise frequency standards, or develop regional or national standard frequency network(s).
Note 5: Requires individual frequency standard per cable headend.

Plan 1 would leave the present system of broadcast allocations intact. Tolerances and 10 kHz offsets would be unaffected. Plan 2 would utilize the same frequency allocations except that offsets would be eliminated and the tolerance for the visual carrier frequency would be several orders of magnitude more stringent than at present. Rubidium frequency standards were envisioned to provide the necessary frequency accuracy and stability. Further, Plan 5 contemplated the purely technical effect of moving up channels 5 and 6 two MHz in order to maintain the 6 N + 1.25 MHz interval. A computer analysis indicated a significant reduction in the number of in-channel beats. The improbability of effectuating such a change in the broadcast allocations plan would require the deletion of these channels within the cable spectrum; off-air carriage would be assigned to other channels. Other non-television services could utilize the 12 MHz thus vacated.

The matrix (Table 3) interrelates Plan 2 (2A) and Plan 5 (5A) which Panel 5 recommended for continued study and Plan 2A which the panel recommended for adoption. It was the consensus of CTAC Panel 5 that the benefits of precise frequency control without off-set would accrue to both the broadcast and cable industry. The benefits would be impressive:

(a) significant reduction of off-air co-channel
(b) improved operation of cable systems in major markets by reducing local station interference
(c) potential for creating a broadcast/cable compatible receiver to minimize use of outboard converters
(d) relate and standardize cable spectrum planning to the standard broadcast allocations to minimize economic impact by not obsoleting millions of existing TV receivers
(e) obtain most of the benefits of Harmonically Related Coherent carrier (HRC) operation on existing systems
(f) permit existing small systems to incrementally augment channel capacity by utilizing mid-band operation without extensive rebuilds.

CTAC Panel 5, in its final report to the CTAC Steering Committee recommended for consideration by the Commission the adoption by cable systems of Plan 2 (2A) and urged that the same be adopted by the VHF and UHF broadcasters. Further the Panel urged that the Commission intensively study the matter of reallocating channels 5 and 6 to conform to a 6 N + 1.25 MHz comb.

Statistical Methods for Pay-TV Trap Selection

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Why Statistical Methods?

Pay penetration potential is decreased if traps fail in any of these important traits:

- Pix destruct ability
- Temperature stability
- Waterproof
- Shockproof

Let's assume that we have tested a quantity of a certain make trap and found reliability numbers (on a scale from 0 to 1) for:

R_p = Pix blanking reliability = 0.9 (example)
R_t = Temperature reliability = 0.9 (example)
R_w = Moisture reliability = 0.9 (example)
R_s = Shock reliability = 0.9 (example)

The total effectiveness of the trap is the product of these numbers:

$$E_t = R_p \times R_t \times R_w \times R_s = 0.9 \times 0.9 \times 0.9 \times 0.9 = .65$$

This means that, due to the peculiar circumstances of the system (reflected in our testing criteria) and the peculiar abilities of this trap, 35% of the pay non-subscribers will not be effectively trapped. This will cause our conversion rate to be only 65% of what it could be with a perfect trap, perfectly suited to our system.

Since perfection is not in the cards, we must attempt to make the best selection available.

We begin by testing different traps to determine their effectiveness = E_t, because the income they will generate (through conversion of non-pay to pay subscribers) is proportional to this number.

Next, we rank them in order of their cost effectiveness = E_c:

$$E_c = \frac{E_t}{\text{Trap Cost}}$$

and choose the trap having the highest numerical value of E_c. In other words, we want the most income per dollar of cost.

Picture Destruction

Pix destruction occurs when the TV set sees a signal less than its minimum detectable input level (threshold sensitivity). Different make sets have different sensitivities and the ambient drop level varies from system to system. To assure pix destruction, one must have the correct combination of drop level, trap loss and TV set sensitivity.

So there is no short answer to the question. "How much trap loss do I need?"

Figure 1 is based on tests by several observers[1] and helps estimate required trap loss, given ambient drop level. Figure 1 assumes higher-than-average set sensitivity. Less trap loss will be required for less sensitive sets.

An example illustrates use of Figure 1.

Given: Drop level = +12 dBmV
Wanted: To destroy video
Procedure: Go vertical, from +12 dBmV and intersect the lowest curve labelled "Video gone." From this point, move horizonatlly to the left scale and read 52 dB.

Although 52 dB gives Pix destruction on the most sensitive sets, 42 dB is enough to make video unintelligible on most high sensitivity sets. And probably 35 dB is enough to make the average set unwatchable but might permit intelligible viewing on high sensitivity sets.

[1] Tests by Dan PIKE, UNITED CABLE, Tulsa, p. 16, CATJ, November 1975.
Tests by CATJ pp. 21-26, CATJ, November 1975.

Destroying Objectionable Sound

Because of the "intercarrier" principle upon which modern TV set design is based, the presence of video is **required** to pass audio: if video is suppressed, and to the extent it is suppressed, audio is noisy, unintelligible or absent.

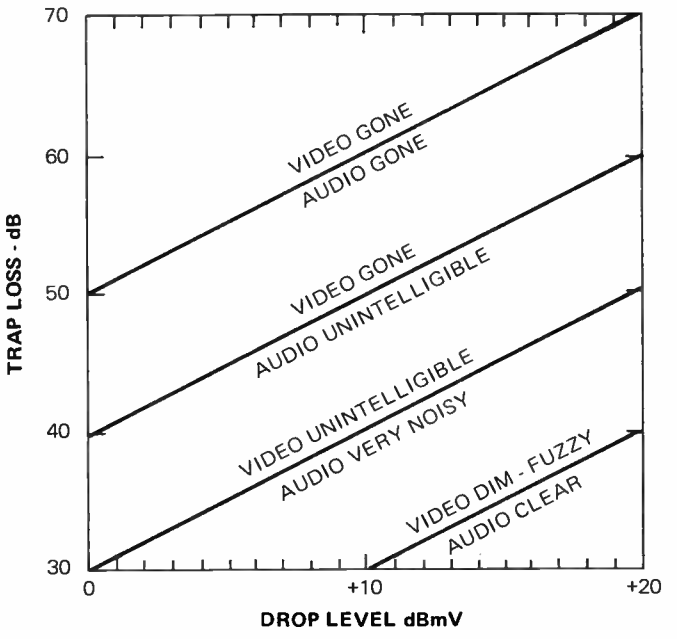
Again, Figure 1 helps us estimate trap loss required to degrade audio in a specific system.

Let's go back to the +12 dBmV system discussed previously and we find that video is noisy at 42 dB (trap loss) in high sensitivity sets and probably unintelligible in sets with lower sensitivity. At 52 dB (trap loss) it is unintelligible in practically all sets.

Before spending extra money on the problem, let's ask ourselves why we want to suppress audio.

If we don't plan showing "blue" movies, there should be no non-subscriber parent complaints and, hence, no reason to consider the problem further.

If we do plan such fare, there are sure to be some complaints. And if these are ignored, we'll be manufacturing regulation bait—and losing some basic cable revenue.



The best approach is to estimate the complaint percentage and plan this amount of very deep notch traps, or direct sound traps, in the mix of traps you'll buy.

For example, if you estimate that 10% of non-subscribers will complain and a separate sound trap seems the best course, then multiply trap cost (in the E_c equation) by 1.10.

Testing for Reliability

Dependable reliability numbers require tests on a **significant** quantity, say 50 or a 1% sample of the total quantity you will use. Further, best results are obtained if you test a virgin batch for each characteristic (water, temperature, shock, picture).

If you insist on running one batch through all tests, then test least destructive characteristics first:

1) Pix test
2) Temperature
3) Water
4) Shock

Pix Destruction Reliability (R_p)

Choose 3 test situations:

(a) Receiver with average sensitivity and lowest system drop level.
(b) Receiver with average sensitivity and average system drop level.
(c) Receiver with average sensitivity and highest system drop level.

In advance of testing, decide the probability of each of the above set of circumstances occurring. That is, for what percent of non-subscribers is this condition representative.

Call these "probabilities of occurance" P_a, P_b and P_c. (These numbers will be 0 to 1.0. For example, 60% = 0.6). Make sure $(P_a + P_b + P_c) = 1.0$.

Now test the batch under all three conditions and compute failure rates. Example:

$$F_a = \frac{\#\text{ units failing condition (a)}}{\text{Total units tested}}, \text{ etc.}$$

The pix destruction reliability is:

$$P_p = 1-(P_a \times F_a + P_b \times F_b + P_c \times F_c) =$$

and represents the percent of successful trappings if you use this trap in your system, if no other adverse conditions (temperature, shock, etc.) are present.

Temperature Reliability (P_t)

Retest the batch passing test (b) above:

(d) Test at the lowest temperature expected in your system. Estimate the probability (% of time) of this condition occuring: P_d, and the failure rate: F_d, (as above).

(e) Repeat for highest expected temperature and compute F_e and estimate P_e.

The temperature reliability is:

$$R_t = 1-(F_d \times P_d + F_e \times P_e)$$

and represents the percent of successful trappings if only temperature is envolved.

Moisture Reliability (R_w)

Test a batch of traps which have passed condition (b) above and immerse them in water for four hours (or longer).

Remove, dry the exterior and immediately test them against condition (b).

Compute the failure rate F_w.

Estimate the probability of occurrence P_w.

If traps are to be mounted outside, you would probably choose $P_w = 1.0$ (100% chance of getting soaked).

If traps are to go in pedestals or in apartment houses, you would choose a lower, applicable P_w.

Moisture reliability is:

$$R_w = 1 - F_w \times P_x$$

and represents the percent of successful trappings if only moisture is envolved.

Shock Reliability (R_s)

Now test a batch of traps which have passed condition (b) above.

You must devise a test which places a representative stress on the trap. If you think drop from pole height is representative, use that.

continued on page 42

RELIABILITY TABLE

Probability Stress Will Occur	F = Failure Rate (%) Under Stress									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
100%	.9900	.9800	.9700	.9600	.9500	.9400	.9300	.9200	.9100	.9000
95	.9905	.9810	.9715	.9620	.9525	.9430	.9335	.9240	.9145	.9050
90	.9910	.9820	.9730	.9640	.9550	.9460	.9370	.9280	.9190	.9100
85	.9915	.9830	.9745	.9660	.9575	.9490	.9405	.9320	.9235	.9150
80	.9920	.9840	.9760	.9680	.9600	.9520	.9440	.9360	.9280	.9200
75	.9925	.9850	.9775	.9700	.9625	.9550	.9475	.9400	.9325	.9250
70	.9930	.9860	.9790	.9720	.9650	.9580	.9510	.9440	.9370	.9300
65	.9935	.9870	.9805	.9740	.9675	.9610	.9545	.9480	.9415	.9350
60	.9940	.9880	.9820	.9760	.9700	.9640	.9580	.9520	.9460	.9400
55	.9945	.9890	.9835	.9780	.9725	.9670	.9615	.9560	.9505	.9450
50	.9950	.9900	.9850	.9800	.9750	.9700	.9650	.9600	.9550	.9500
45	.9955	.9910	.9865	.9820	.9775	.9730	.9685	.9640	.9595	.9550
40	.9960	.9920	.9879	.9840	.9800	.9760	.9720	.9680	.9640	.9600
35	.9965	.9930	.9895	.9860	.9825	.9790	.9755	.9720	.9685	.9650
30	.9970	.9940	.9910	.9880	.9850	.9820	.9790	.9760	.9730	.9700
25	.9975	.9950	.9925	.9900	.9875	.9850	.9825	.9800	.9775	.9750
20	.9980	.9960	.9940	.9920	.9900	.9880	.9860	.9840	.9820	.9800
15	.9985	.9970	.9955	.9940	.9925	.9910	.9895	.9880	.9865	.9850
10	.9990	.9980	.9970	.9960	.9950	.9940	.9930	.9920	.9910	.9900
5	.9995	.9990	.9985	.9980	.9975	.9970	.9965	.9960	.9955	.9950

safety and health protection on the job

Washington, D.C.
1973
OSHA 2003

Peter J. Brennan
Secretary of Labor

U.S. Department of Labor
Occupational Safety and Health Administration

The Williams-Steiger Occupational Safety and Health Act of 1970 provides job safety and health protection for workers through the promotion of safe and healthful working conditions throughout the Nation. Requirements of the Act include the following:

Employers:

Each employer shall furnish to each of his employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to his employees; and shall comply with occupational safety and health standards issued under the Act.

Employees:

Each employee shall comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to his own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to ensure compliance with the Act.

Inspection:

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint:

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold names of employees complaining on request.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or otherwise exercising their rights under the Act.

An employee who believes he has been discriminated against may file a complaint with the nearest OSHA office within 30 days of the alleged discrimination.

Citation:

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty:

The Act provides for mandatory penalties against employers of up to $1,000 for each serious violation and for optional penalties of up to $1,000 for each nonserious violation. Penalties of up to $1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to $10,000 for each such violation.

Criminal penalties are also provided for in the Act. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of not more than $10,000 or by imprisonment for not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties.

Voluntary Activity:

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce injuries and illnesses arising out of employment.

The Department of Labor encourages employers and employees to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries.

Such cooperative action would initially focus on the identification and elimination of hazards that could cause death, injury, or illness to employees and supervisors. There are many public and private organizations that can provide information and assistance in this effort, if requested.

More Information:

Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from the nearest OSHA Regional Office in the following locations:

Atlanta, Georgia
Boston, Massachusetts
Chicago, Illinois
Dallas, Texas
Denver, Colorado
Kansas City, Missouri
New York, New York
Philadelphia, Pennsylvania
San Francisco, California
Seattle, Washington

Telephone numbers for these offices, and additional Area Office locations, are listed in the telephone directory under the United States Department of Labor in the United States Government listing.

Cable Fables

The cable television industry is still in its infancy. It is appropriate then, that some of the things that obtain in one's infancy be viewed in light of their applicability to CATV. Nursery rhymes, for example, re-written in the vernacular of CATV might go as follows:

Jack be nimble
Jack be quick
Jack jump over the 35 mile radius.

Mary had a little lamb, but considering the depressed state of the industry, a little lamb is better than none, and much better than cat food and spinach.

Jack and Jill went up the hill
To fetch a better cable bill
Jack fell down
And word got around
That Jill now has a younger partner.

Little Miss Muffet
Sat on her tuffet
Counting her disconnects each day.
Along came pay cable
And now she is able
To keep the collectors away.

Rockabye Cable
In the tree top
When the wind blows
The cable will rock.
If the tree breaks
The cable will fall
And down will come cable
Stocks, subscribers, profits, and all.

As I was going to St. Ives
I met a man with seven franchise.
Everyone had seven mile
Every miles had seven home
Every home has seven set
Franchise, mile home, and set
How many subs can he get?

Hickory dickory dock
I bought a cable stock.
The prime went up
The stock came down
And now I'm on the block.

Little Jack Horner
Sat in a corner
Filling out his 326
He put down the facts
Calculated his tax
And said what a good boy am I.

Sing a song of six percent
A pocket full of rye
Four and twenty TV signals
Floating in the sky.
When the sky is opened
Cable begins to sing
But isn't that a tempting dish
To sweeten up the thing.
The producer's in his counting house
Counting out his money.
The artist in the parlor
Eating bread and honey.
The Nets were in the garden
Feeding on their woes
When along came copyright
And complications rose.

Mistress Mary
Quite contrary
How does your system grow.
With make-ready bills
And special skills
And well-kept houses all in a row.

Peter, Peter
Pumpkin Eater.
Had a wife
But couldn't keep her
He got her a job with Ma Bell
And there he kept her very well.

Henry Hooper hooked a hunk of happy houses
A hunk of happy houses Henry Hooper hooked.
If Henry Hooper hooked a hunk of happy houses,
Where is the hunk of happy houses Henry Hooper hooked?

March winds and April showers
Bring T & E's and long NCTA hours.

Early to bed
And early to rise
Makes a man healthy, wealthy and wise.
But doesn't leave time for exhibits, tech. sessions,
hospitality suites, banquets, nights out on the town,
and other necessary duties.

Humpty Cable sat on a wall
Humpty Cable had a great fall.
All of Cable's horses
And all of Cable's men
Finally put Cable together again.

Brumley Prunk

First Annual Conference on CATV Reliability

Sponsored by the Society of Cable Television Engineers and the Philadelphia Chapter, Institute of Electrical and Electronics Engineers

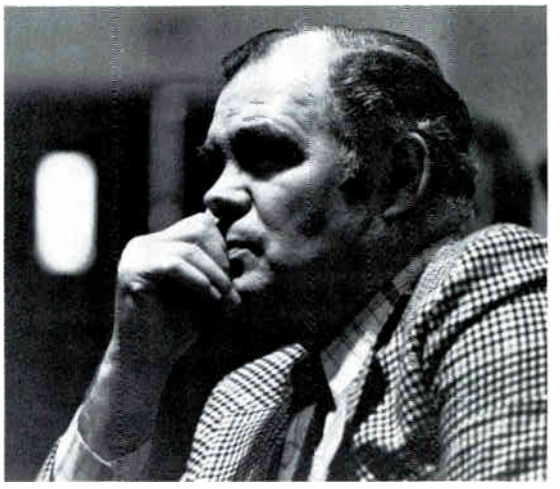
February 5 and 6, 1976
City Line, Philadelphia, Pennsylvania

Components and Product Design

Reliability Considerations in Design & Use of RF Integrated Circuits
James Humphrey, TRW
Component/Equipment Statistical Performance
Warren L. Braun, PE, ComSonics, Inc.
Economics of Reliability
Archer S. Taylor, Malarkey, Taylor & Associates
Luncheon Principal Speaker: Delmer C. Ports,
Vice President, Engineering, NCTA
Long Term Maintenance of Shielding Integrity in CATV Systems
Keneth Simons, Simons & Wydro, Consultants
Stress Analysis of Aerial CATV Cable Structures
Eric Winston, Jerrold Electronics Corporation
Headend Concepts
Steve Biro, B-RO Antenna
Redundancy Aspects of AML/LDS Systems
A. H. Sonnenschein, Theta-Com of California

Systems Design and Operations

Legal Problems of CATV as Applied to the Consumer
Kenneth N. Jacoby, Esq.
System Layout Techniques for Improved Performance
Richard Covell, GTE Sylvania
Practices to Minimize Outages
Robert Bilodeau, Suburban Cablevision
Construction Practices for a Longer System Life
M. Quarashi, AM Communications
Standby Power and Surge Protection Techniques
S. Switzer, Switzer Engineering Services
Tower Selection Reliability Considerations
M. J. Vlissides, Consultant
Luncheon Principle Speaker, Dr. Robert Powers,
FCC Cable Television Bureau
Reliability Considerations in the Selection & Use of Converters
Steven McVoy, Coaxial Scientific
Performance Testing
Frank J. Bias, Tele-Vue
Maintenance and Personnel Training Programs
G. C. Kleykamp, UA-Columbia Cablevision
CATV Earth Station Reliability
Carl Van Hecke, Andrew Corp.




76
RENCE

More Meetings

Tom Straw, Texas A&M, came to Washington in early February to stage training session for NCTA.

NCTA Technical Conference at Statler Hilton in Washington.

SCTE MidAtlantic-Appalachia Meeting in Cumberland, Maryland during January.

Bob Powers of the FCC Cable TV Bureau and Delmer Ports, NCTA, at the Engineering Standards Committee Meeting.

SCTE MidAtlantic Appalachia Meeting in Cumberland, Maryland during January.

canadian column continued

satellites are designated ANIK I, II, III. ANIK is the Eskimo word for brother. Currently, ANIK III is being considered as an in-orbit standby by Telesat Canada, although it is possible that in the future some channels may be used for normal service.

ANIK II, up to May 15th 1975, carried signals for RCA Global and RCA Alaska, using three channels full time and an additional channel part-time.

As the Western Union and RCA Satellites became operative, the use of ANIK II by U.S. organizaions dropped to a single transponder. This is currently used by RCA Globecom for communications between San Francisco and Tule, Greenland.

Telesat Canada has recently signed an agreement with RCA for the provision of ANIK IV. This will be a hybrid satellite with 12 transponder channels in the 4 and 6 GHz bands, and a further 4 transponders in the 12 and 14 GHz bands. It is expected that ANIK IV will be operational in 1978.

Satellite Communications and Canadian Cable

Although over the last two years considerable discussion and negotiations have taken place between the Canadian cable television industry and Telesat Canada, no agreements have been reached.

There have been a number of reasons for this. The Telesat Letters Patent give the Company an **exclusive** mandate to operate a commercial satellite telecommunications **system** in Canada. To date this has been interpreted as meaning the complete system including the ground station. This has, to a considerable extent, reduced the flexibility of planned use by cable TV companies. This interpretation of the Telesat mandate is currently being challenged by the people of Teslin in the Yukon. Secondly, as a rule of thumb, satellite communications in Cable Television applications become competitive with terrestrial microwave at around about the 800,000 subscriber level. Unless a company or consortium with either current or potential subscribers of this order can make use of satellite long haul distribution the cost is prohibitive. There have been a number of attempts to organize such consortiums, but partially due to individual corporate policies and partially due to the timing and policies of the Canadian Department of Communications, it has not been possible for Canadian cable television licensees to come to any viable agreement with Telesat Canada for the carriage of off-air U.S. signals. In the absence of this, long term terrestrial microwave agreements have recently been signed between Canadian cable television licensees in the Maritime provinces and in mid-Ontario. This would seem to preclude, at least for some time the economic use of Canadian satellites for the carriage of U.S. off-air signals.

The other likely application for the satellite in our industry is for the carriage of pay TV channels. At the moment, introduction of pay TV has been deferred by CRTC, our regulatory body, and hence there seems to be no immediate likelihood of the Canadian cable TV industry being in a position to make use of the many ANIK channels available.

Statistical Methods for Pay-TV Trap Selection

Do the test and compute the failure rate F_s.

Then estimate that percent of traps (P_s) which will probably be subject to this stress.

Compute shock reliability:

$$R_s = 1 - F_s \times P_s$$

Trap Effectiveness

Trap effectiveness is influenced by all the above factors and is:

$$E_t = R_p \times R_t \times R_w \times R_s$$

See the following (ficticious) table and note the fallacy of choosing a trap on the basis of superior electrical properties alone.

Trap #	R_p	R_t	R_w	R_s	E_t	Cost	E_c
(1)	0.80	.99	.98	1.00	.776	3.75	(.207)
(2)	0.90	.97	.91	.92	(.812)	4.25	.191
(3)	(1.00)	.92	.92	.85	.719	5.00	.144

(3) Is best electrical trap but returns least revenue per dollar expense
(2) Generates most actual revenue
(1) Has most revenue per dollar cost

In May cled interviews FCC Cable Bureau Staff member Bob Powers. Don't miss it!

national affairs continued

electrotechnology, many of which are used as regulatory and licensing documents in nuclear and power industries. He is vice chairman of the American National Metric Council and a member of the executive committee of the U.S. National Committee of the International Electrotechnical Commission.

Until his appointment Mr. Sherr served as a member of ANSI's board of directors, chairman of the Electrical and Electronics Standards Management Board, and on the executive committees of the Executive Standards and Organizational Member Councils.

ncta technical topics continued

output or by the use of illegal output amplifiers. This is sufficient to introduce an interfering signal into the headend in some cases, or by direct pickup into the receiver in others.

CB operators, like everyone else, like to get the most out of their sets. A power meter is a very frequently used accessory, and an unskilled operator may attempt to tune for maximum reading on the meter. Since these meters do not distinguish between the legitimate output frequency and harmonics, any increase is usually due largely to increase in harmonics.

What to Do?

The first thing to do is, of course, to check the system and locate any sources of ingress. This may also solve a leakage problem as well.

Once satisfied that the system is operating with adequate integrity, the next thing to do is, if possible, locate the CB operator. Frequently, you will find operators cooperative and willing to attempt to bring their systems into compliance. When they are not cooperative or obviously operating illegally, it is advisable to notify the Field Office of the FCC of your region and the Field Engineering Office of the FCC in Washington, DC, 20554. Obviously, it is impossible for the FCC to cope with all individual cases; but, when they receive information from an over-powering number of cases, they will be encouraged to deal with it on a class basis.

One final step that may be taken that helps in many cases, particularly when the source of interference is from the 27 MHz frequency gaining ingress to the system, is to install highpass filter matching transformers in the home terminals affected by the interfering signal. These baluns were designed to filter upstream signals, but they will also attenuate downstream signals very effectively in this sub-band frequency range.

Leakage

Again, a number of cases can be used as examples in discussing the mechanism of leakage as a potential source of interference. Normally, any source of leakage has a broadband characteristic; so, almost any frequency range would do.

For several reasons we will use the frequency range of 108-118 MHz as a potential interference case for this illustration. This happens to be the frequency range used by the FAA for some critical air navigation functions; and, by coincidence, it is approximately two and one-half times the low end of the frequency band used in cable, and the upper end of the band is also approximately two and one-half times these same frequencies. Interference to these operations is also critical since navigational malfunctions could have serious consequences. The systems operate automatically without the benefit of human interpretation and judgement. This is contrasted with interference to voice-communications, for example, where some interference can be tolerated; because, even though it may be annoying, it will not necessarily destroy the intelligence. But, an instrument landing system, by contrast, will read an interfering signal with the same confidence that it reads an authentic signal.

It has been established that cable systems meeting the FCC requirement on leakage will not in any way affect the navigation systems operating in this frequency range. Even with mild leakage, there will be no cause for concern since there are some degrees of tolerance involved.

However, with a serious cable fault, such as a complete break in the outer sheath or a large segment of an exposed center conductor or a broken connector shell, there is a possibility that interference can be caused to an air navigation system. This possibility, even under these circumstances, is remote because a number of coincidences must occur simultaneously. One of these coincidences is to be within a few hertz of the 30 Hz sideband frequency of the navigation signal. Another is that a major lobe of the radiated signal from the cable break must be oriented in the direction of the aircraft. Despite these unlikely coincidences, potential interference is still a remote possibility.

The radiating characteristics of these kinds of cable breaks have been found to be quite similar to that of a long wire excited near the middle and unterminated at the ends. It produces a radiating signal pattern with the larger lobes a few degrees off the line of the cable and numerous minor lobes more or less broadside. The maximum of the major lobes is approximately equal to the maximum signal from a dipole.

What To Do?

Obviously, it is important to operate within FCC limits and make adequate checks to ensure that this integrity is maintained. It is also very important to operate in a manner so that even remote chances of causing interference in this frequency range are avoided in the event of a major breakdown. There are several options available for considerations that may serve this purpose.

continued on page 44

ncta technical topics continued

One, of course, is to shut off any signals within this frequency range when a break occurs until the break is repaired and operation is returned to normal. This is not always feasible because it requires some method of almost continuous monitoring.

Another method is to deploy the frequencies so that they cannot possibly interfere, even during the time that the system is malfunctioning. If TV Channel 2 is operating in the area and your use of this frequency range is for something like a pilot carrier, or similar function, you can place it on the frequency of the second harmonic of Channel 2. In this case, the signal leaked from the cable system will be completely masked by the second harmonic and cannot possibly cause any problem to any air navigation system.

Another solution is to select your frequency source so that you are approximately 25 kHz from any operating channel of the FAA system. Since any potential interfering signal must be within approximately 30 Hz to have any affect, this places you safely out of reach. You should verify this frequency by a good frequency measurement so that you will have full confidence in your operation.

FAA assignments are on 100 kHz intervals at the present time. They are anticipating at some future date going to 50 kHz spacing.

There are other options; but, as far as is known, they are experimental developments at this stage.

The moral to all of this is: Maintain the system integrity to the best of your ability; if a major breakdown occurs, take corrective action as quickly as possible. For certain protection, build in some foolproof defenses.

National Cable Television Association
918 16th Street, N.W.
Washington, D.C. 20006
Phone: (202) 466-8111

news continued

materials activities of the firm including the purchasing, ordering of materials, and material control.

Prior to his new position, Roser was a purchasing agent for Theta-Com. He has over 10 years experience in the materials management field, holds a Bachelor of Science Degree in engineering from Purdue Univeristy and a Masters Degree in business administration from the University of Michigan.

TONER ANTI-THEFT SYSTEM

A new, inexpensive anti-theft system has been announced by Toner Cable Equip., a CATV distribution company specializing in system security. Called the SQUEELER™ the system provides an 80 dB horn alarm actuated whenever a protected apartment TV distribution cabinet is opened illegally, whether by force or with a master key.

In operation, the SQUEELER™ can't be shut off until the Master Control unit is reset. The Master Control is located in a secure area, such as the apartment managers' office. The SQUEELER™ is a "supervised circuit" and will be triggered by disconnection of or cutting any interconnecting cable or wire.

The Toner SQUEELER™ comprises a magnetic door switch and two actuator units which are interconnected by drop-cable, plus, the master control and a plug-in, adjustable B-plus supply. The system is complete and ready to use on any existing cabinet door.

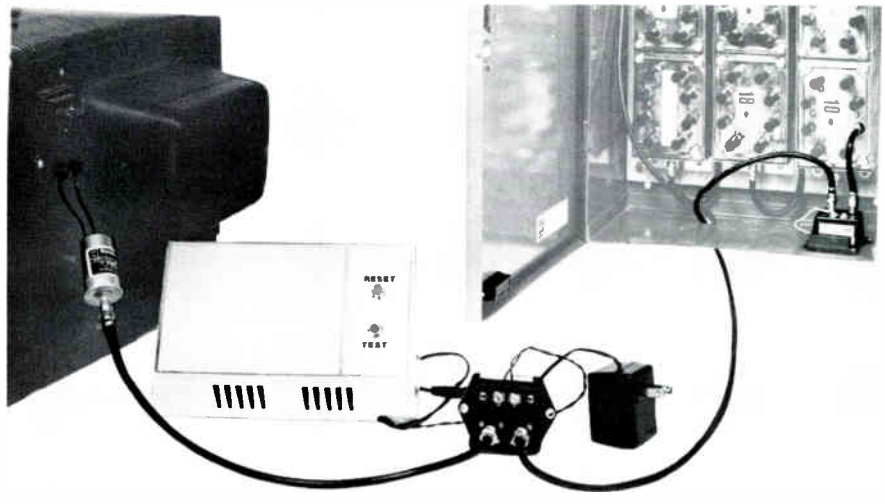
Auxilliary contacts are provided on the master control so that multiple cabinets (or other doors) in the same building may be similarly protected. Extra actuating units and magnetic switches for such multiple use are separately supplied. (Circle Reader Service Card Number 115)

CTIC DIRECTS INQUIRY OF REGULATORY AGENCIES

The Cable Television Information Center has received a $194,000 grant from the National Science Foundation to direct a 19-month inquiry into the workings of regulatory agencies.

Working with researchers from The Urban Institute and others knowledgeable in the area of regulatory affairs, the center will focus study on decisionmaking processes of the Federal Communications Commission (FCC) and the Environmental Protection Agency (EPA). Investigators will compare and examine methods employed by the FCC, a traditional, multi-headed, independent regulatory commission with methods utilized by EPA, a single-managed, executive agency, in reaching policy decisions.

In announcing this grant, Sheila Mahony, the center's executive director, noted the intense examination being given to the regulatory process



Toner Anti-Theft System

news continued

by both the White House and the Congress. "I hope that our inquiry will lead to a better understanding of the regulatory process, and provide documentation useful to the legislative and scholarly world in their reevaluation of the role of regulatory agencies," she said.

Ms. Mahony and Susan Greene, regional director, will supervise the research effort. In addition, an advisory board consisting of the following individuals will oversee the project: Mr. William Ruckelshaus, former EPA administrator and currently a member of Ruckelshaus, Beveridge, Fairbanks and Diamond; Mr. Dean Burch, former FCC chairman and currently a member of Pierson, Ball and Dowd; Dr. Edwin A. Deagle, Jr. executive assistant to the director, Congressional Budget Office; Dr. James Q. Wilson, professor of government, Harvard University; Dr. Graham T. Allison, professor of politics, Harvard University; Dr. William M. Capron, associate dean, John F. Kennedy School of Government, Harvard University; and Mr. Steven G. Breyer, professor of law, Harvard University.

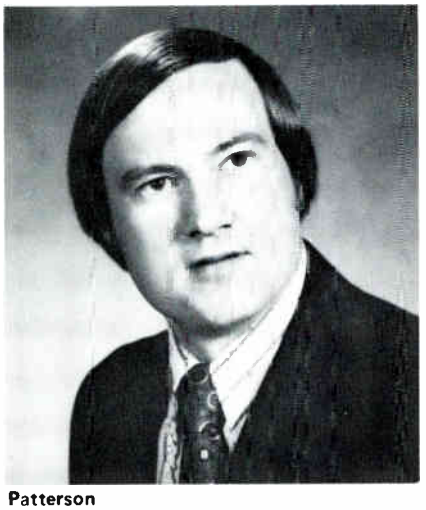
The Cable Television Information Center, a part of The Urban Institute, is a private, nonprofit group which assists local governments in the development of cable television in the public interest.

MEN FROM T.I.M.E.S ON THE MOVE

C. Dean Taylor has been appointed National Accounts Manager of Times, a new post designed to provide greater service to Times' customers nationwide. Taylor has been associated with Times since 1970, first as North Central Sales Representative, then as North Eastern Regional Sales Manager. In 1974 Dean became Eastern Regional Sales Manager.

A graduate of North Texas State University with a BBS in Marketing, Taylor spent 3 years in Dallas as Sales Representative, working with utilities,

Taylor



Patterson

Stovall

distributors, OEM's and contractors and entered the CATV market in 1969.

He is headquartered at the Times Wire & Cable facility in Wallingford, CT.

Times also announced appointment of John Patterson as Times' Sales/Service Representative in the Pacific Northwest. He will be responsible for Sales and Service in the states of Washington, Oregon, Idaho, Montana, Wyoming, Colorado, North and South Dakota and Nebraska.

John is no newcomer to the CATV Industry . . . having been with Ameco Cable in Phoenix. He joined Times when Ameco was acquired by Times in 1970. John worked in production and quality control until 1972. Upon graduation with a BA in Marketing, John was appointed Times' Pacific Northwest representative. In 1974 he was transferred to the Southwest.

According to Times, this move is designed to provide continued extensive service to the Northwest, an area rapidly on the move in CATV systems. Patterson will headquarter in Spokane, WA.

Also announced by Times, the appointment of Jerry Stovall as Times' Representative in the states of Texas, New Mexico, Oklahoma, Kansas, Missouri, Arkansas and Louisiana.

Jerry spent 3 years in the Navy as an aircraft electronic technician. He spent 5 years with Collins Radio in Dallas, and then 9 years as District Manager for the Mosler Safe Company.

SATELLITE PROGRAMMING

Home Box Office, Andrew Corp. and United Cable extended an invitation to industry personnel to view the launch of satellite entertainment programming in California during early March. The historic event marked inauguration of domestic satellite transmission for cable television viewers in the state. Hayward-San Leandro Cable TV began programming on March 8.

Tours of the earth station site were arranged and staged by the host firms, with dignitaries and guest celebrities on hand to initiate the service.

SATELLITE SWITCHOVER

On February 28 earth station antennas across the nation receiving Home Box Office programming were re-pointed

news continued

from the Westar II satellite to the Satcom I satellite. This required an azimuth change due to different positions of the satellites over the equator. Feed polarization was also changed since Satcom I has a polarization offset by approximately 25° from the plane of the equator.

Andrew Corp. says "its 10 metre earth station antenna took this repointing in stride. The position change was accomplished by cranking a worm-screw jack to the new position. The polarization change required loosening of the orthocoupler on the back of the dish and rotating the unit clockwise. The Andrew change-over was accomplished simultaneously at many locations around the country in less than 15 minutes."

In early summer transponder frequencies will change from transponders 17 and 23 to transponders 18 and 22, respectively. Andrew says its earth station antennas will be prepared for this. The receiver used with Andrew earth station antennas is fully tunable over the entire 3.7-4.2 GHz band and can be easily retuned to any new transponder frequency.

JERROLD'S FUTURE FEATURES TAP

On April 4 at the Dallas Convention Jerrold will unveil its new Future Features Tap.

With a full 7-amperes power-passing current rating, these new two-, four- and eight-outlet taps are designed for maximum future growth. Other significant features include: an endless woven metallic gasket for maximum RF integrity; unique F-fitting weather seal with 'puncture-seal' membrane; interchangeable bottom plates which permit attenuation values and/or the number of tap outlets to be changed—without disconnecting cables; built-in plastic guards for shock-hazard protection; and an umbrella type cover design with continuously formed

Andrew technician re-pointing 10 metre receiving antenna.

Jerrold's Future Features Tap

weather seal to keep water out of the housing/cover interface.

Interference between tap outlets is minimized with guaranteed minimum 30 dB tap-to-tap isolation. (Circle Reader Service Card Number 116 for more information.)

CONTRACT SIGNING

Jim Danielson, general manager of Husco Cablevision in Huntington, West Virginia (seated), signs the contract for a turnkey CATV operation involving approximately 52 miles of plant as Dennis Ashcroft (left), east-central regional sales manager for Theta-Com, and Duane Crist, Theta-Com's general sales manager, look on. Theta-Com's Phoenician II equipment, providing a capacity of up to 27 channels, will be used in the Husco system.

For new product information, circle the 100 series numbers on the Reader Service Card.

critique/letters

LAST YEAR IN ANAHEIM

One of the best technical meetings of the CCTA conventions was last year's (1975) in Anaheim. This was due to the efforts of the Society of Cable Television Engineers, and particularly Frank Bias.

Please accept the thanks of the CCTA and myself for the well attended, coordinated and planned two day session. Having done this for a number of years, I appreciate it more than anyone.

Again, thanks to you, Frank Bias and the participants for the great two day program.

Sincerely,
Kester Krieg
Vice-President
Technical CCTA

RE: "CATV RELIABILITY CONFERENCE 1976"

Great Job! This was one of the best conferences of its kind I have attended in my ten years in the industry.

A large round of applause is deserved and gladly given to all speakers and SCTE/IEEE personnel responsible for the success of this "first" annual conference.

Sincerely,
MAHONING VALLEY CABLEVISION
W. Robert Felder
Operations Manager

THANKS TO THE REPRESENTATIVES

The SCTE North Central Chapter Annual Meeting was held February 6 and 7 in Milwaukee, Wisconsin.

The meeting was combined with technical sessions and election of officers. Attendance was excellent with persons from eight states registered.

We would like to thank the following manufacturers for sending representatives to speak at the seminar. RCA/EIE Division, Scientific-Atlanta, Superior Continental/Comm-Scope Division, Theta-Com/AML Division and Tektronix. Each representative gave an excellent presentation.

Sure hope that we can keep up the momentum now that the interest has been revived.

Yours very truly,
Glenn Chambers
Secretary-Treasurer

PROOF OF PERFORMANCE TIMETABLE

The first article in your Proof of Performance Timetable series (C/ED Vol. 1, No. 1, Oct. 1975) contains several misleading statements, one of which is perhaps not very serious.

The first one, which is not too serious except for the fact that it might lead someone to spend more money than is necessary, is the statement that "no other instrument in its price range (than a good frequency counter) will satisfy the FCC requirements." Measurements of much greater precision than the FCC requires of CATV systems have been made over a great many years before the present generation of frequency counters became available, and some of the older heterodyne frequency meters are available on the surplus market at quite attractive prices. Most of this equipment, when properly used and calibrated is quite capable of exceeding the requirements of the FCC. I will admit that the modern frequency counters, when properly used and calibrated, can simplify the procedures greatly.

I must, however, strongly object to the statement on the second page that, "At exact zero beat, you will hear a whistle or shrill tone from the FSM speaker." As a matter of fact at exact zero beat (or even a few Hertz away from zero beat) you will hear nothing. The presence of the whistle or shrill tone will indicate that you are at least 5 kHz and possibly more than 10 kHz away from zero beat, depending on how shrill is shrill. If the counter is read under these conditions you will guarantee an error in your measurement of at least this amount. After obtaining the shrill tone or whistle, it is necessary to continue tuning carefully in the direction which causes the tone to become lower and lower in pitch, until it is so low in pitch that it can no longer be heard. At this point the error due to not quite achieving zero beat will probably be under 20 Hz, or so. This will be more than adequate to meet FCC requirements. However, it is still possible to reduce this error even further by observing the swing of the needle on the SLM.

Even if this step is added to the procedure to reduce or eliminate the error mentioned above, the procedure as outlined is subject to an even more serious error. In the case of a signal which is modulated with more or less constant frequency signals, such as the 15,750 Hz sync. (and its harmonics), it is quite possible to beat the transfer oscillator with one of the sideband components instead of the carrier signal. In this case one can obtain a measurement which is in error by 15.75, 31.5 kHz etc. If this is added to the error previously mentioned, it is easily seen that, unless one first determines that the beat is with the carrier, the procedure, as outlined is very likely to produce errors in measurement greater than the total tolerance allowed by the FCC. This is in addition to any calibration tolerances in the counter.

In Method II: on the same page (using a spectrum analyzer) there is the statement, "When the exact zero beat is achieved, there will be a very

continued on page 50

critique/letters continued

noticeable jumping and moving of the pattern." Again, at exact zero beat there will be no jumping or movement of the pattern caused by the beat. If one uses a wide resolution bandwidth, such as is shown in the photographs accompanying the article, it is possible to measure the frequency of the sync. sideband components instead of the carrier as mentioned above with the aural method. Luckily, most of the better spectrum analyzers allow the use of a narrow resolution bandwidth, so that this error can be entirely eliminated.

With this procedure, however, another possible error must be looked out for and avoided. It is possible to obtain a false zero beat indication when the spectrum analyzer scan rate and the beat frequency have certain integral relations. This can be easily checked for by changing the scan rate slightly.

It is probably not likely that anyone who has performed precise frequency measurements in the past would fall into the traps which I have mentioned, and I am certain that the author did not intend to oversimplify the description of the procedures to the extent that errors of such magnitude might occur.

However, I do feel that a novice might well be misled by the very short description of the procedures, and hope that my comments will help to reduce the chances of this occurring.

Yours truly,
Argyle W. Bridgett
Consultant

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c/ed

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SOCIETY OF CABLE TELEVISION ENGINEERS

MEMBERSHIP APPLICATION

DO NOT FILL IN SHADED MARGINS.

DATE _____

1. _____ LAST NAME _____ FIRST _____ INITIAL _____ TITLE
2. _____ COMPANY _____ DEPARTMENT/DIVISION
3. _____ COMPANY STREET ADDRESS _____ CITY _____ STATE _____ ZIP
4. **CHECK APPLICABLE:** ☐ *OPERATING COMPANY* ☐ *MANUFACTURER* ☐ *SERVICE* ☐ *CONSTRUCTION*
5. ☐ *CONSULTANT* ☐ *EDUCATIONAL* ☐ *GOVERNMENT*
6. *OTHER:* _____

7. **PROFESSIONAL EXPERIENCE: BEGIN WITH CURRENT EMPLOYMENT**

8. _____ COMPANY NAME _____ CITY AND STATE _____ HOW LONG
9. _____ POSITION _____ BRIEF DESCRIPTION OF DUTIES
10. _____ COMPANY NAME _____ CITY AND STATE _____ HOW LONG
11. _____ POSITION _____ BRIEF DESCRIPTION OF DUTIES

14. **EDUCATION:**

15. _____ SCHOOL _____ DEGREE/CERTIFICATE _____ YEAR
16. _____ SCHOOL _____ DEGREE/CERTIFICATE _____ YEAR

17. **PROFESSIONAL REFERENCES: (SCTE MEMBERS REQUIRED FOR MEMBER GRADE)**

18. _____ NAME _____ COMPANY _____ TITLE
19. _____ STREET ADDRESS _____ CITY _____ STATE _____ ZIP
20. _____ NAME _____ COMPANY _____ TITLE
21. _____ STREET ADDRESS _____ CITY _____ STATE _____ ZIP

22. **HOME ADDRESS:** _____ STREET _____ CITY _____ STATE _____ ZIP

23. **DIRECT MAIL TO:** ☐ *BUSINESS ADDRESS* ☐ *HOME ADDRESS*

24. **REFERRED TO SCTE BY:** _____ NAME _____ COMPANY

25. **I AGREE TO ABIDE BY THE CONSTITUTION AND BY-LAWS OF THE SOCIETY IF ADMITTED:**

26. _____ SIGNATURE _____ DATE

CHAPTER: _____ DATE _____ DATE COPY TO CHAPTER

ADMISSION COMMITTEE ACTION: _____

MEMBERSHIP GRADE: ☐ *SENIOR MEMBER* ☐ *ASSOCIATE MEMBER* ☐ *SUSTAINING* ☐ *MEMBER*
☐ *STUDENT MEMBER*

D. ADDRESS CHANGE: _____ **DATE:** _____

C. ☐ *ORIGINAL MEMBERSHIP CARD*

☐ *CERTIFICATE RENEWALS:*

INVOICE _____ DATE

INVOICE _____ DATE

INVOICE NO. _____ DATE

B. MEMBERSHIP GRADE _____

DATE ADMITTED _____ MO _____ YR

INVOICE NO. _____

AMOUNT DUE _____

DATE RECEIVED _____

CHECK NO. _____

A. LAST NAME _____ FIRST _____ INITIAL _____

CHAPTER _____

EXPIRATION DATE _____

ZIP CODE _____

GENERAL INFORMATION

SOCIETY OF CABLE TELEVISION ENGINEERS

PROGRAMS

SCTE programs technical sessions on a regional basis for members to attend and participate in. The Society encourages attendance at these conferences by all interested parties, programming each event with top industry personnel.

While the technical disciplines are of prime importance to the career growth of members, SCTE does not overlook the importance of learning good overall business management practices and also provides programming in business principles and management techniques.

Membership in SCTE ensures you of advance announcement of industry events and attendance at membership discount prices.

PUBLICATIONS

COMMUNICATIONS/ENGINEERING DIGEST is the official journal of SCTE and is published monthly. C/ED is mailed to members of the Society as one of the membership features.

In addition, SCTE publishes a monthly membership newsletter, THE INTERVAL, which is specifically designed to report what the chapters throughout the organization are doing, their accomplishments and news. Included in THE INTERVAL are Publication Listings noting reports and papers of interest to SCTE membership which are published by other organizations; news of important FCC regulatory actions; and announcements of membership activities from a national level.

SCTE continues to publish periodic bulletins informing you of activities of the Society and of other engineering and business groups within the industry. The Society also publishes papers of interest to the membership which are available for a nominal cost.

A Membership Directory updated annually listing all members of SCTE will prove to be a handy reference when locating technical personnel in the industry. It is available at a reasonable cost.

STRUCTURE

SCTE relies on active regional chapters throughout the United States. There are also chapters located in foreign countries. The Society will continue to encourage development of chapters wherever broadband and cable communications become a part of the day-to-day living pattern. New domestic chapters are encouraged as membership growth demands.

MEMBERSHIP

SCTE is a non-profit organization with five member grades: Senior Member; Member; Student Member; Associate Member and Sustaining Member. Senior Member is reserved for those who have made significant contributions to their field. Qualification for Member Grade is a minimum of three years of active experience as an engineer or chief technician in cable television. The requirement for Associate Member is either active experience as a technician in cable television or engineering, or technician experience in allied communication fields. Student Membership is by application but limited to those attending recognized technical schools. Sustaining Members include companies involved with cable television or other fields of communications which actively support the Society.

HOW DO I JOIN?

Fill in the application form and mail it today. Dues for Senior Member and Member Grade are $20.00 per year; Associate Member is $15.00 per year; Student Member is $6.00 per year. Sustaining Memberships are available for a minimum of $100.00 per year. Do not enclose payment with this application form. You will be notified upon acceptance to the SCTE and invoiced for dues. Your membership card and certificate, along with an issue of THE INTERVAL and the latest issue of COMMUNICATIONS/ENGINEERING DIGEST will be forwarded immediately.

Postage Will Be Paid by Addressee

BUSINESS REPLY MAIL

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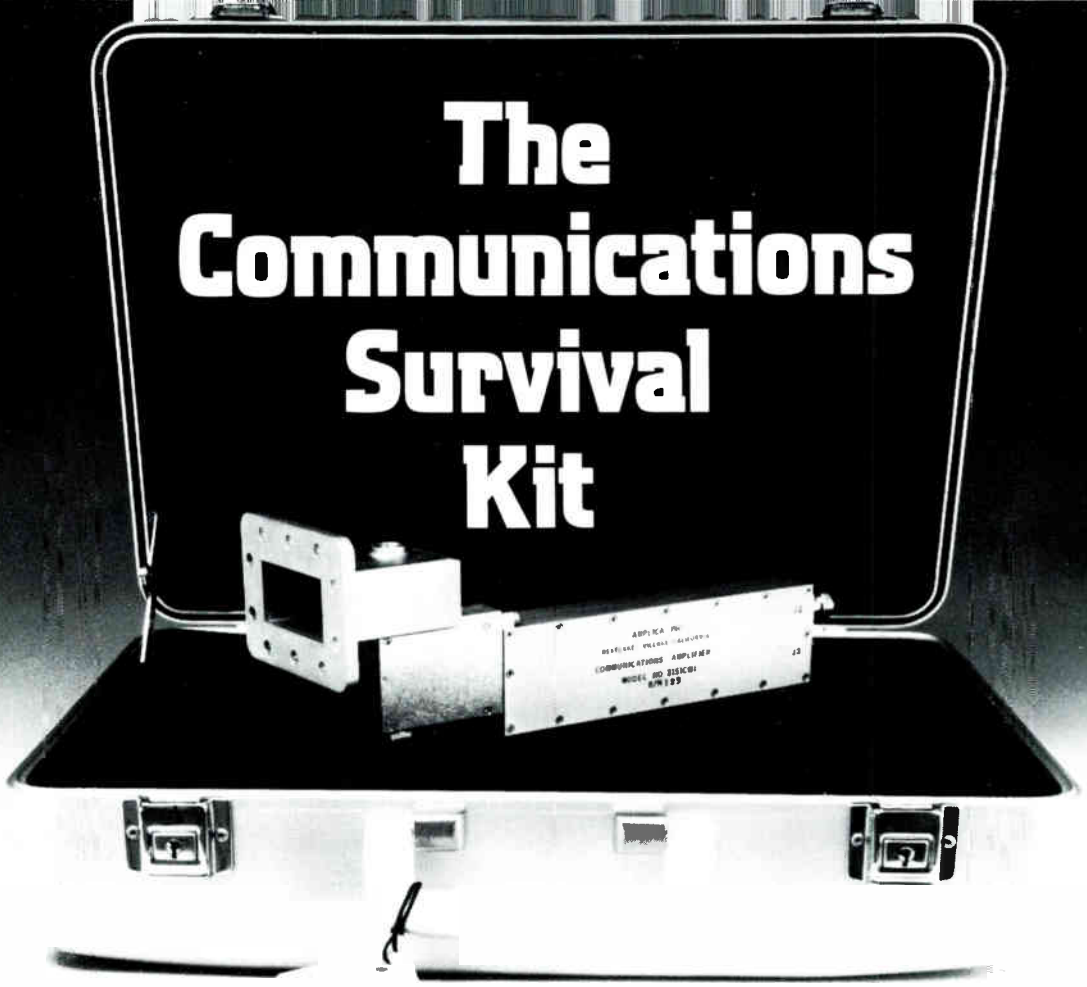
ATTENTION: J. BAER

FOLD AND STAPLE

The Communications Survival Kit



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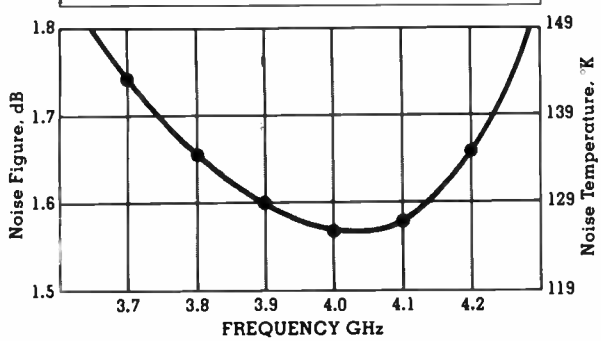
Amplica's Super Low Noise, Low Cost Amplifiers

Now you can assure the reliability of your Satellite Communications Receivers with Amplica's new GaAs FET Amplifiers. These exceptional amplifiers provide a 1.8 dB noise figure at 4.0 GHz (uncooled) making them ideal for low cost earth stations where low noise and wide dynamic range receivers are required. Their outstanding specifications guarantee the ultimate in stable performance and long life which means low maintenance costs for remote communications ground stations. For details on these and other reliable communications amplifiers tailored to fit your needs, call or write us today.

502CSL Guaranteed Specifications

Frequency Range	3.7 to 4.2 GHz
Noise Figure (1)	1.8 dB Max. (Any 100 MHz) 2.2 dB Max. (Full 500 MHz)
Gain	50 dB Min., ± 0.5 dB Flatness
Intercept Point	+23 dBm Min.
Power Supply Options (2)	+25 ± 10 Vdc, 100 Ma −28 ± 10 Vdc, 130 Ma −48 ± 15 Vdc, 110 Ma 115 ± 10 Vac, 50-400 Hz

Notes:
(1) Measured with cryogenic standard at 23° C
Noise figure will change 0.005 dB/° C (approx.).
(2) All power supply optionals include internal regulation.



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