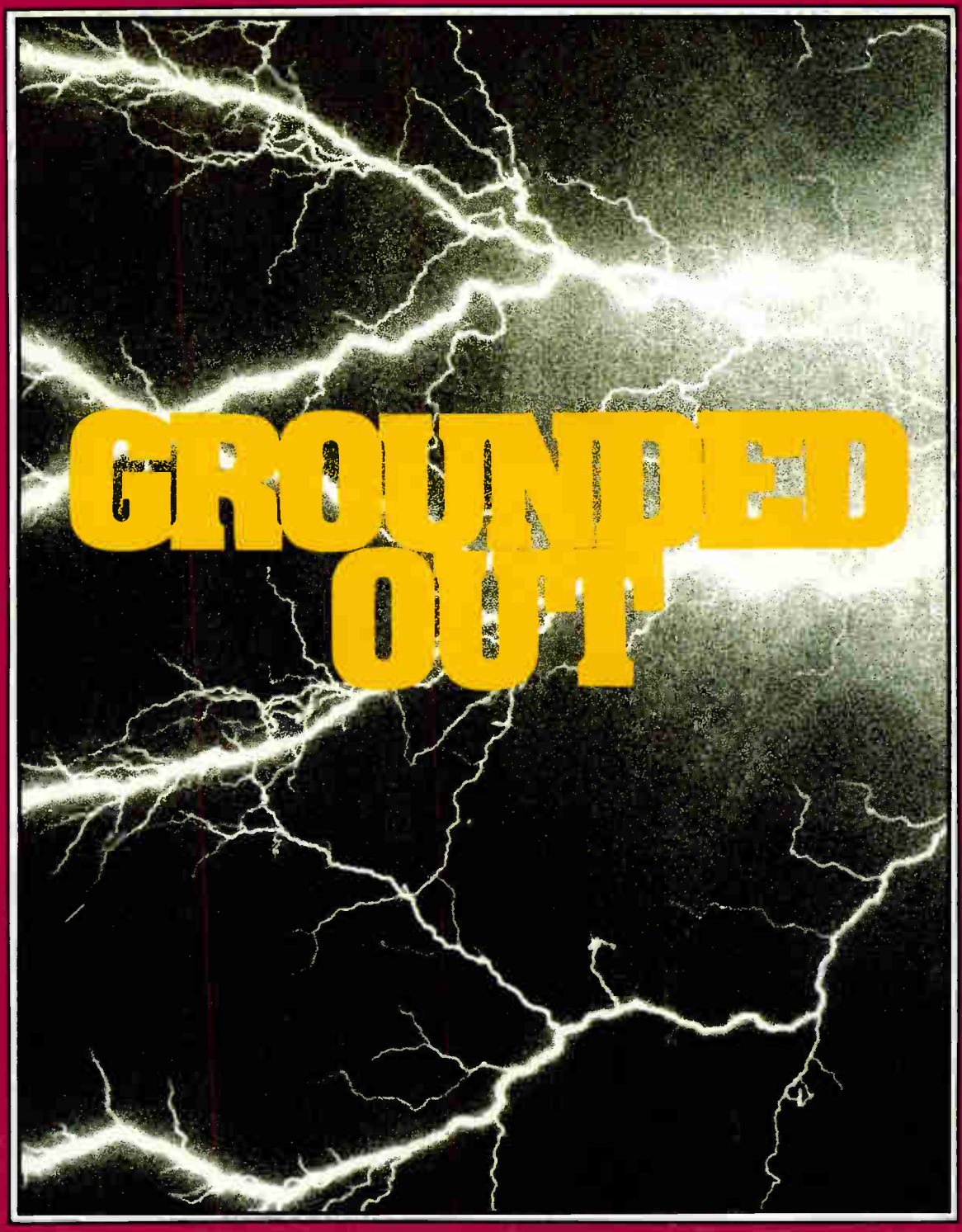
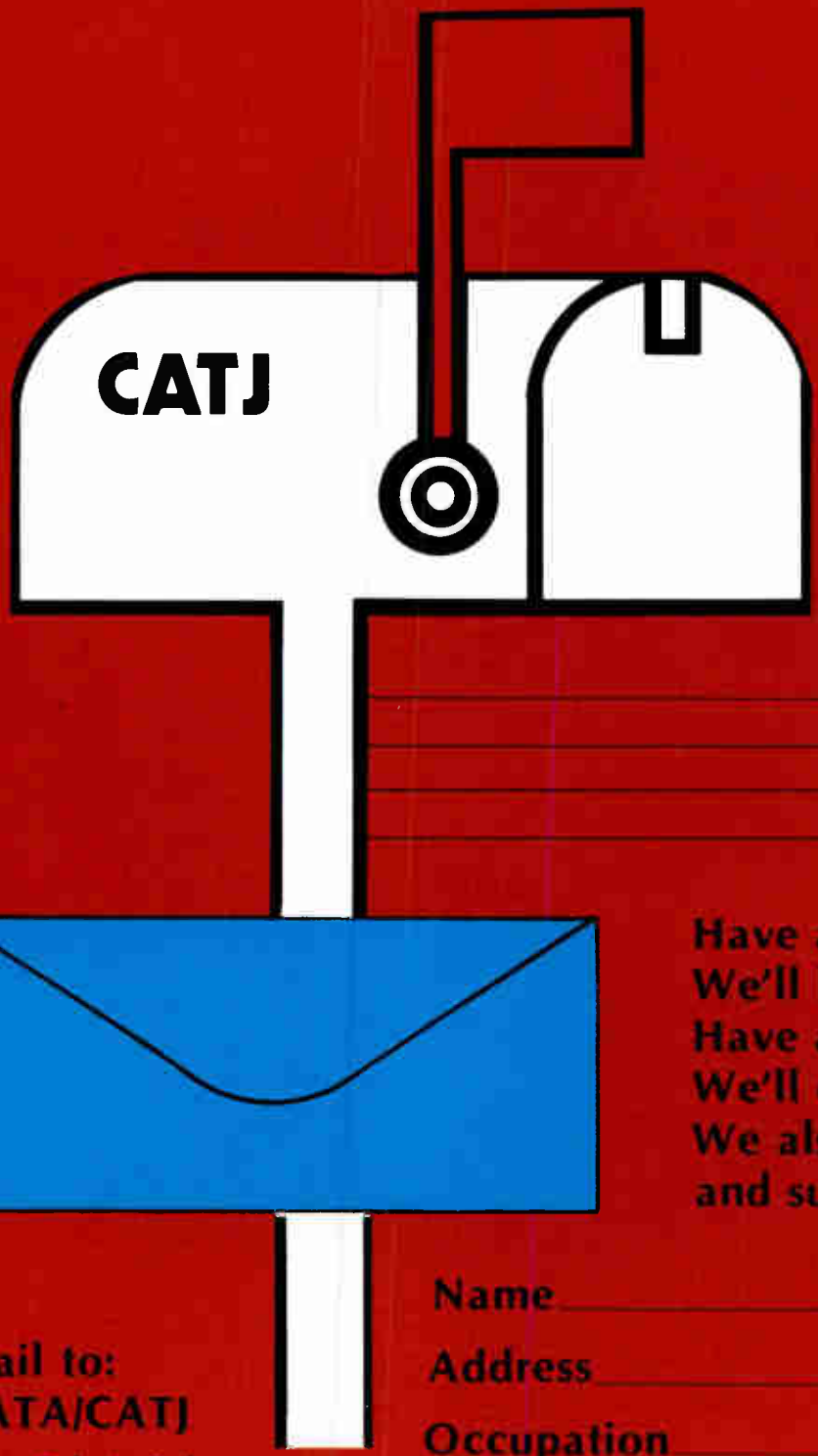
CATJ

OFFICIAL JOURNAL OF THE COMMUNITY ANTENNA TELEVISION ASSOCIATION
MAY 1985





DROP US A LINE

Have a story to tell?
We'll listen
Have a question?
We'll do our best to answer it
We also welcome your opinions and suggestions

Name _____

Address _____

Occupation _____

Signature _____ Date _____

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CATA/CATJ
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Oklahoma City, Oklahoma 73107
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Broadband's line of quality amplifiers has your system covered from head-end to house-drop. Designed for CATV, SMATV and MATV home-run or branching systems, they meet most requirements for home, apartment, condominium, hotel and motel distribution systems.

Most feature push-pull hybrid circuitry for maximum output capability while minimizing distortion. Our new apartment amplifiers (SMDA-PLUS, XMDA-PLUS) and line extenders (BLX-PLUS) use the latest in power-doubler hybrid technology for state-of-the-art performance.

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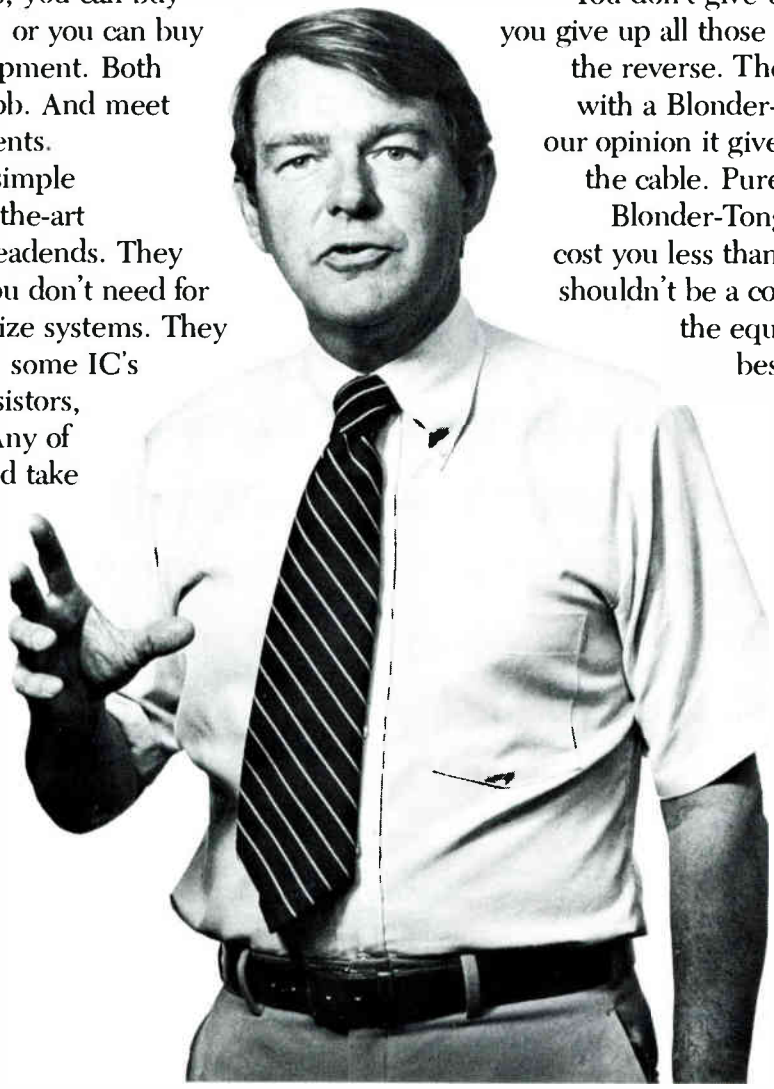
For your headends, you can buy simple equipment, or you can buy very complex equipment. Both types will do the job. And meet all FCC requirements.

We handle the simple headends: state-of-the-art Blonder-Tongue headends. They don't have what you don't need for small-to-medium size systems. They lack two IF stages, some IC's and countless transistors, diodes and such. Any of which could fail and take the channel off the cable — if we had put them in there. But we didn't.

Because you don't need them. The less there is to go wrong, the less likely it is that something will.



You don't give up a quality picture when you give up all those extra components. Quite the reverse. There's no signal conversion with a Blonder-Tongue headend. And in our opinion it gives you a better picture on the cable. Purer.

Blonder-Tongue headends will always cost you less than the fancy ones. So price shouldn't be a consideration. You can buy the equipment that does the job best, even if it costs less.

Before you make any decision, call us toll-free. We'll tell you what we've learned over the years supplying Blonder-Tongue equipment in cable systems.

Call
800-523-5947.
In Pennsylvania:
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The phone call and the advice are always free.

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cable equipment, inc.
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horsham, PA 19044

CATJ

VOL. 12 NO. 5

CATJ, The Official Journal for the Community Antenna Television Association
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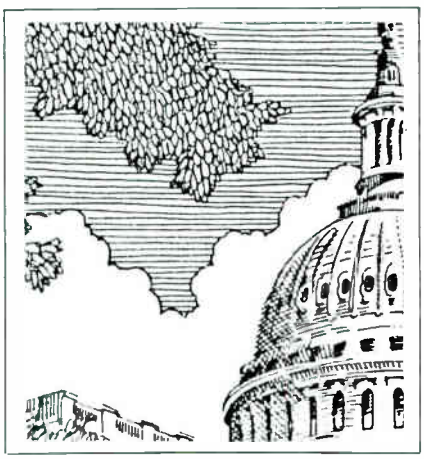

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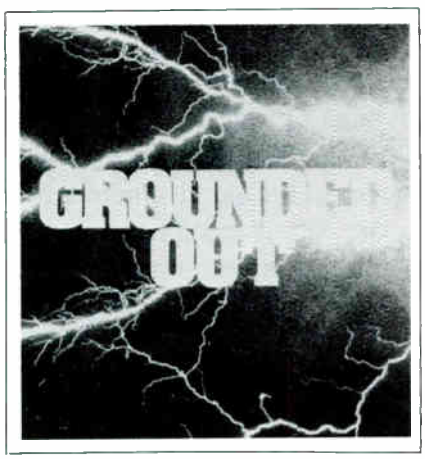

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catatorial

Carl Schmauder
PRESIDENT OF CATA

SHOW BUSINESS

It's "Show Time" once again. No, not the pay movie service variety — it's the time of year set aside for the conventions of both the national cable television trade associations. The differences between the two meetings really highlight the different attitudes and approaches of the organizations, and I'd like to take a look at that with you for a moment.

As you should know by now, the annual CATA meeting this year is going to be in Nashville, Tennessee on June 17th through the 19th. We have planned yet another seminar loaded with the down-to-earth information needed by cable operators to deal with the day-to-day questions that arise when you run a system. The seminar, as usual, will be family oriented, with one of the most comprehensive children's and spouse programs ever offered. Yes, there is a difference this year — the CATAkids and the spouse program will be self-sustaining and, therefore, you will have to pay the cost of the program, but what a program it is! Frankly, I'm sorry I can't sign up for the CATAkid program —they get three days of professionally chaperoned activities including a trip to the Marshall Space Flight Center! It looks great.

Why do we do all this? Mainly because that is what the CATA members have told us over the years they want. A meeting where the whole family can come, a meeting where there is lots of practical information in an informal setting that allows operators to trade information on the latest successful techniques for running a profitable system, and the ability to participate in all the activities. That's what we are providing.

Through the years there of course has been a parallel development in the CATA Show as well. That has been the growth of the exhibit floor. When we started out we did not really intend to have an exhibit floor. The idea was to simply hold a seminar for cable operators on the latest information they needed to run their systems. An additional part of the theory was that we would try to have as many hands-on type folks as possible give the seminars. That is, we were more interested in practical applications than in "talking heads". We have never been interested in inviting "big names" from Washington or anywhere else to talk to us — we wanted the people who were actually doing the work to convey their knowledge to the rest of us.

Many folks, however, particularly our associate member friends, wanted to have some presence at the Show. They felt that it was probably the only time during the year that they would get a chance to meet and talk to the CATA operators who were doing business with them throughout the year. So we allowed a limited number of suppliers to attend the Show and have tabletop exhibits. Well, as you know, that has grown to the point where many operators come to the Show specifically for the exhibits. We have modified the exhibit floor in the last two years to try to get the "interactive" nature of the CATA Show back in the forefront by having technical demonstrations right on the floor, and a "consultant's corner" to deal with the many specific questions that CATA members want to ask. It has worked very well, and we expect it to be even better this year. ►

But, of course, the CATA Show is not simply a trade show, and we are very conscious of that. We are not trying to make money on the show, unlike many other groups. CATA never designed the Show to be a money generator for the Association. We charge only as much as is necessary to cover the cost of putting the Show on. Yes, it has gotten more expensive over the years, in part because we now only go to larger, "gateway" cities which allow for easy air transportation, and in part because we still aim for the the "family" atmosphere which requires us to book into resort-type hotels rather than just a big, downtown building. All of this costs, but our members seem to indicate that they are willing to pay the cost to enjoy the benefits of a unique meeting.

Contrast all this with the soon-to-be-held NCTA show. There is no question that it is quite a show. It is the largest trade exposition in the industry. There are lavish booths, and even more lavish entertainment and diversions such as the casino gambling. The show also has plenty of seminars with all the big names sitting on the panels. It is everything you ever expected from big trade show — and it is a major money maker to boot. Nothing wrong with any of that in our book — it's just that we are different, and proud of it.

CATA does not put on its show for "business". We have it because our members enjoy it, learn from it, and take advantage of the opportunity to "put their feet up" and compare notes with other operators for everyone's mutual benefit. Try it, you'll like it.□

CATJ STAFF

Business and Managing Editor
Celeste Rule Nelson

Executive Assistant to the Editor
Diane Howard

Contributing Editors
J. Searcy Hollis
Ralph Haimowitz
Glyn Bostick
Robert Arnold
Stephen Effros
Ellen Adams

Art Director/Marketing
Phyllis Crumpler

Assistant Art Director
Dianna Johnson

Graphics Designer
Joyce Meiki

CATJ OFFICE

4209 N.W. 23rd, Suite 106
Oklahoma City, OK 73107
405/947-4717

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CATA OFFICES

CATA (Washington Office)
Stephen R. Effros, Executive Director
3977 Chain Bridge Rd.
Fairfax, Va. 22030
(703) 691-8875

The Community Antenna Television Association, Inc. is a nonprofit organization formed under Chapter 19, Title 18 of the Statutes of the State of Oklahoma. As such, no part of its assets or income shall be the property of its members, such assets and income shall be devoted exclusively to the purposes of the Corporation.

The Community Antenna Television Journal (CATJ)—ISSN-0194-5963—is published monthly by Television Publications, Inc., 4209 N.W. 23rd, Suite 106, Okla. City, OK 73107. Subscription price: $22.00 per year, $26.00 per year Canada, Mexico, and foreign is $30.00 per year. Second class postage paid at Oklahoma City.

C.a.l.e.n.d.a.r o.f E.v.e.n.t.s

MAY

1-3 Magnavox Mobile Training Seminar, St. Paul. Contact: Laurie Mancini, 800-448-5171.

5-7 Virginia Cable Television Association Annual Meeting, Wintergreen, VA. Contact: VCTA, 804-358-7060.

6-8 Louisiana Cable Television Association Annual Convention, Hilton Hotel, Lafayette, LA. Contact: LCTA, 504-928-5604.

6-8 Magnavox Mobile Training Seminar, St. Paul. Contact: Laurie Mancini, 800-448-5171.

7-9 Jerrold Technical Seminar, Montreal, Quebec. Contact: Beth Schaefer, 215-674-4800.

13-15 Third Annual Sat Expo '85, Sheraton DTC, Denver. Contact: Irl Marshall, 303-779-7930. Sponsored by Channel Guide.

21-23 C-Cor Technical Seminar, Dallas. Contact: Bryon Brammer, 800-233-2267.

JUNE

2-5 National Cable Television Association Annual Convention, Las Vegas Convention Center, Las Vegas, NV. Contact: NCTA 202-775-3550.

2-5 Consumer Electronics Show, McCormick Center, Chicago. Contact: Electronic Industries Association, 202-457-8700.

3 ACE Awards Ceremony, Las Vegas Convention Center, Las Vegas, NV. Contact: Susan Wilson 202-775-3611.

16-18 Northeast Cable Television Technical Seminar, Roaring Brook Ranch Resort, Lake George, N.Y. Sponsored by New York State Commission on Cable Television. Contact: Bob Levy 518-474-1324.

17-18 Municipal Administration of Cable Television, University of Wisconsin-Extension, Madison, WI. Contact: Barry Orton, 608-262-2394.

17-19 Community Antenna Television Association Annual Convention, Nashville. Contact: CATA, 703-457-8700.

17-20 Mississippi Cable Television Association Annual Meeting, Royal d'Iberville, Biloxi, MS. Contact: David Bailey, 601-437-8300.

18-20 Jerrold Technical Seminar, Dallas. Contact: Beth Schaefer, 215-674-4800.

JULY

9-11 Jerrold Technical Seminar, Portland, OR. Contact: Beth Schaefer, 215-674-4800.

9-11 Cable '85, Brighton, U.K. Contact: Online Conferences, 212-279-8890.

15-17 New England Cable Television Association Annual Convention & Expo, Dunfey Hyannis Hotel, Hyannis, MA. Contact: William Durand, 617-843-3418.

23-25 C-Cor Technical Seminar, Boston. Contact: Bryon Brammer, 800-233-2267.

23-26 Florida Cable Television Association Annual Convention, Amelia Island Resort, Amelia Island, Fl. Contact: Bob Brillante, 904-681-1990.

25-27 Colorado Cable Television Association Convention, Beaver Run Resort, Breckenridge, CO. Contact: Steve Durham, 303-863-0084.

AUGUST

4-7 CTAM Conference, Fairmont Hotel, San Francisco, CA. Contact: CTAM 404-399-5574.

13-15 Jerrold Technical Seminar, Minneapolis. Contact: Beth Schaefer, 215-674-4800.

25-27 Eastern Cable Show, Congress World Center, Atlanta, GA. Contact: Southern Cable Television Association, 404-252-2454.

28-30 **Missouri Association Show,** Lodge of the Four Seasons, Lake of the Ozarks, MO. Contact: Charlie Broomfield, 816-453-3392.

SEPTEMBER

15-17 **South Dakota Cable Television Association Meeting,** Sylvan Lake Resort, Custer, SD. Contact: SDCA, 605-854-9121.

17 **Pennsylvania Cable Television Association Annual Meeting,** Atlantic City. Contact: Patricia Wilson, 717-234-2190.

18-20 **Atlantic Cable Show,** Atlantic City, NJ. Contact: 609-848-1000.

25-27 **Great Lakes Expo,** Convention Center, Indianapolis, Indiana. Contact: Ohio Cable Television Association, 614-461-4014.

OCTOBER

6-8 **Kentucky Cable Television Association Annual Fall Membership Meeting,** Capitol Plaza Hotel, Frankfort, KY. Contact: Patsy Judd, 502-864-5352.

8-10 **Jerrold Technical Seminar,** Atlanta. Contact: Beth Schaefer, 215-674-4800.

15-17 **Alabama Cable Television Association Meeting,** State Lodge, Guntersville, AL. Contact: Mary John Martin, 205-228-1821.

22-24 **Mid-America CATV Show,** Vista International Hotel, Kansas City, MO. Contact: Rob Marshall, 913-841-9241.

27-29 **Iowa Cable Television Association Convention,** Cedar Rapids, IA. Contact: Jeff Barnes, 515-842-7202.

29-31 **Jerrold Technical Seminar,** Toronto, Ontario, Canada. Contact: Beth Schaefer, 215-674-4800.

NOVEMBER

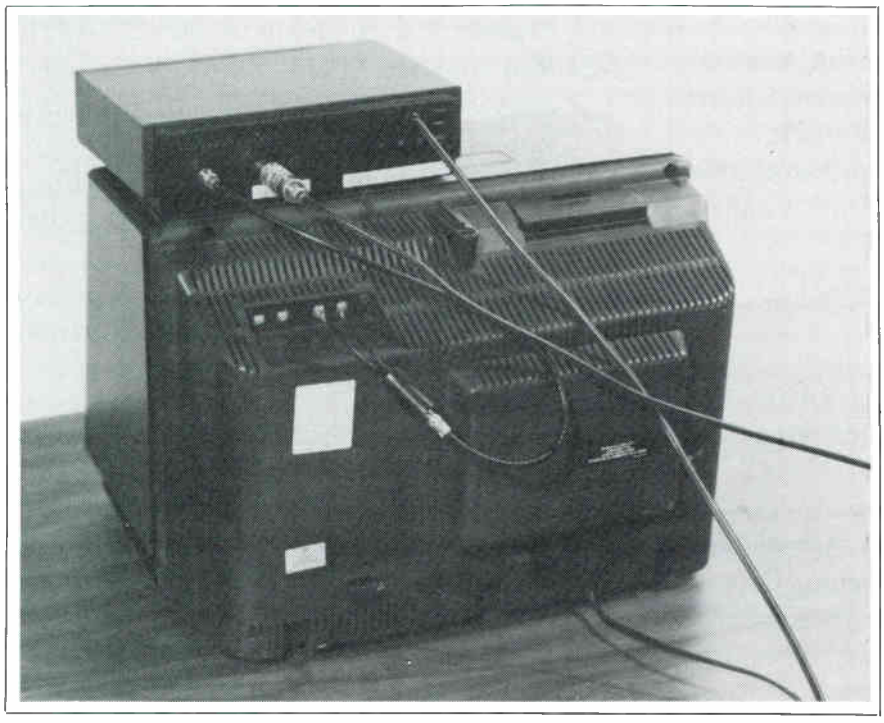
12-14 **Jerrold Technical Seminar,** Boston. Contact: Beth Schaefer, 215-674-4800.

DECEMBER

4-6 **Western Cable Show,** Convention Center, Anaheim, CA. Contact: California Cable Television Association, 415-428-2225. □

MORE APPLICATIONS FOR THE POSITIVE SECURITY SYSTEM

THE CABLE TECH'S FILTER COOKBOOK #25



The Positive Trap is easily installed at the subscriber's TV set (before the converter, in converter systems).

By: Robert Arnold
Glyn Bostick
MICROWAVE FILTER COMPANY, INC.

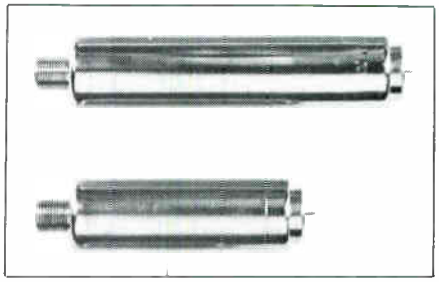
SUMMARY

The Positive Security System can serve a number of different revenue-generating functions, including use as a cost-effective supplement to current negative trap security systems.

NEGATIVE/POSITIVE TRAPPING: REFRESHER

Negative trapping (see **"Theft of Service or Signal Security"**, by Peggy Isaacson, **CATJ, May '84,** page 38) is probably the most extensively used system for premium channel security. It consists of placing a bandstop filter (for the premium channel) in the subscriber's drop cable. For obvious reasons, it must be placed out of the subscribers reach, usually at the tap. To further defeat theft of services, the trap is usually installed with tamper resistant hardware.

Positive scrambling and trapping is newer (see **CATJ, July 1984).** It consists of inserting a jamming signal between video and audio frequencies at the head-end, and a trap is supplied to the subscriber to remove this carrier. Less security is required in this case since the subscriber has no incentive to remove the trap. However, **nominal** security is usually installed to prevent the trap from being taken when the subscriber moves.



Single and Double Channel Positive Trap.

POSITIVE SUPPLEMENTS NEGATIVE SYSTEMS

Once a system is negatively trapped, it is not cost effective to change over to the positive system — and junk all those negative traps! However, the postive system can supplement the current negative system, especially in off-system hook-ups to generate extra revenue. Perhaps the most common, and powerful supplemental use of positive systems is pay security in hook-ups to multi-subscriber buildings, where subscribers are selectively sold the premium: apartment houses and hotels for example. Many buildings are not compatible with negative trapping due to the wiring method or difficulty to accessing individual apartment cables. Cables have to be fished out of walls and/or security boxes installed on the premises.

A positive encoder is installed at the building entry and positive traps installed on the premium subscribers' TV sets, thus bypassing any problems in the internal distribution system.

The positive trapping system may also supplement when the

you can't afford not to Subscribe.

NAME _____

COMPANY _____

☐ CABLE TV SYSTEM
☐ SUPPLIER ☐ OTHER

ADDRESS _____

CITY _____ STATE _____

ZIP _____ PHONE _____

TITLE ☐ MANAGER ☐ CHIEF ENGINEER
☐ CHIEF TECH ☐ INSTALLER ☐ BUSINESS OFFICE
☐ ALL OF THE ABOVE (CHECK PRIMARY FUNCTION)
☐ OTHER

SIGNATURE _____

DATE _____

☐ $22.00 Enclosed for 1 Year
☐ $60.00 Enclosed for 3 Years

CANADA/MEXICO SUBSCRIBERS: Add $4.00 per year to rates given above. All other Foreign Countries add $8.00 per year to rates given above. Special handling arranged upon request. U.S. CURRENCY ONLY DRAWN ON A U.S. BANK.

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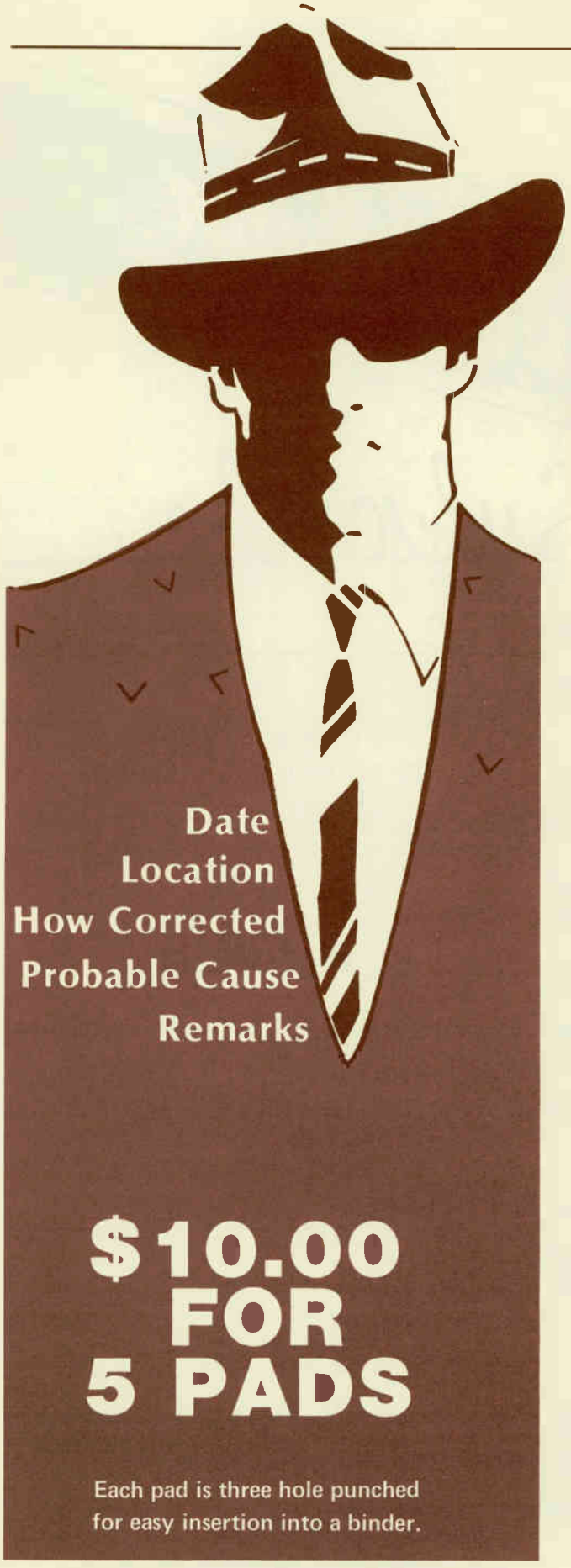

Detection and Correction

SIGNAL LEAKAGE LOG

This Signal Leakage Log satisfies the requirements of the FCC Rules and Regulations, Part 76, Subpart K, Paragraph 76.610(d). Although the log is intended for recording cable television signal leakages in the Aeronautical frequency bands (108-136 MHz and 225-400 MHz), it may be used by cable system operators to record all system signal leaks and insure an effective on-going signal leakage detection and correction program.

When using this log for recording signal leakage in the Aeronautical Frequency Bands, the log sheet must remain in the file for a minimum of two years.

NAME _____

ADDRESS _____
(cannot accept P.O. Box)

COMPANY _____

CITY _____

STATE _____ ZIP _____

QUANTITY (SETS OF 5) _____

AMOUNT ENCLOSED _____

* Check must be enclosed with order

$10.00 FOR 5 PADS

Each pad is three hole punched for easy insertion into a binder.

CATJ
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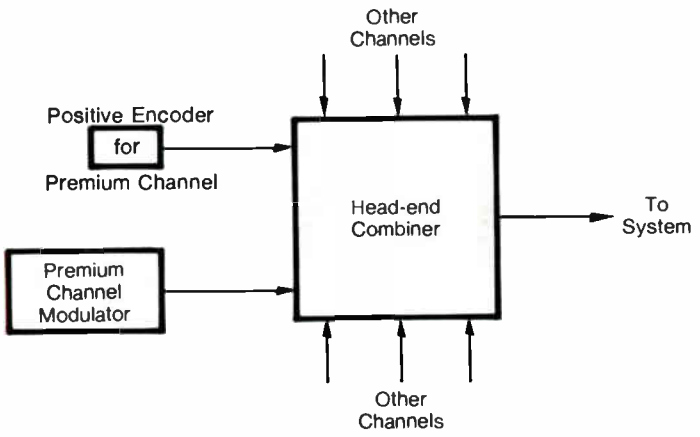
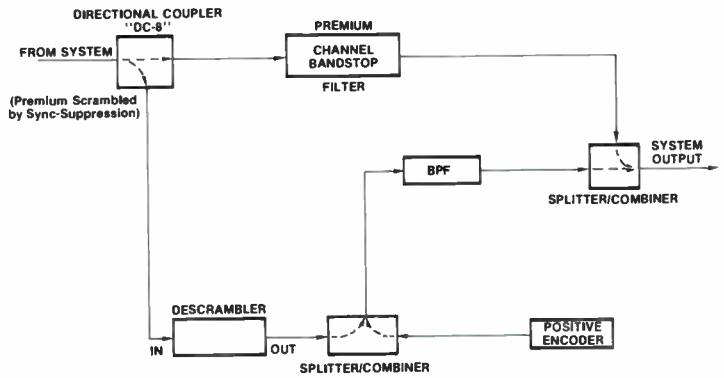
Okla. City, Okla. 73107



Method of injecting positive encoder signal at head-end.



Method of changing scrambling method (from synch-suppression to positive trap) at front-end of subscriber's building.

security system is synch-suppression scrambling. Here the scrambling method is changed over at the building entry. The premium channel is unscrambled, by installing one descrambler, and the channel encoded with the positive system.

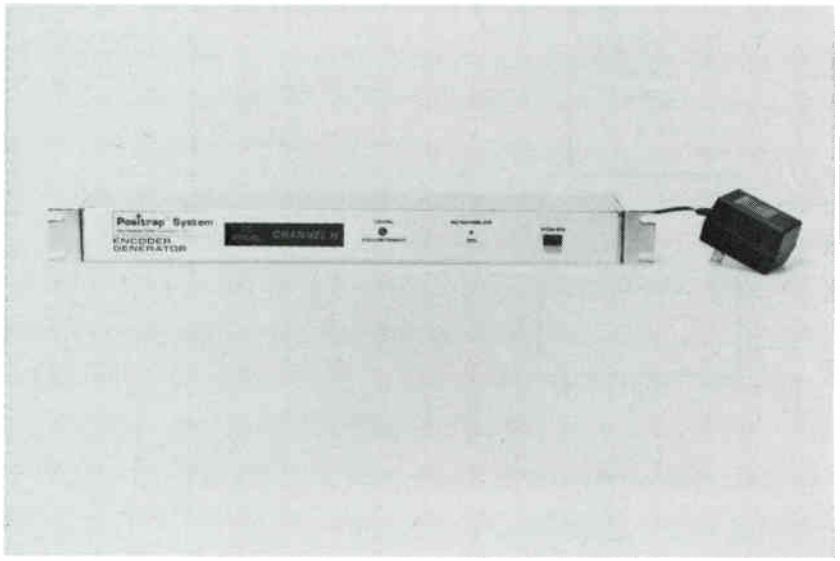
SECURE CLOSED CIRCUIT CHANNELS

In hospitals and teaching institutions, certain closed circuit channels are intended for "professional eyes" only and must be restricted, yet must be transmitted system wide. Or a motel or business institution may have a private information channel intended for employees or executives only. In these cases, a positive encoder is installed at the building head-end and positive traps installed on authorized sets only. The positive idea can allow random patch-in: roving, authorized viewers can carry a positive trap with them, to attach to the nearest TV set.

CHANNEL STRATEGY AND REDUCE THEFT

Let's rethink the above statement that it's never cost effective to change over from a negative to a positive system in the CATV system proper. Depending on the exact numbers, it may be feasible to abandon the negative system and go positive when the penetration rate is low or falling significantly and theft rate is known to be high. A **high** theft rate **can**, and often is, a major cause of low penetration. If, tomorrow, you switched from negative to positive, you would **initially** wipe out **all** theft due to illegal hook-ups, defective negative traps and maybe unauthorized multiple sets. And you would probably see the rate of **new** subscribers climb. Your only significant **new** expense would be decoder traps for **current, legal** subs!

Multiple premium channel menus are also feasible with the positive system (as is now common ►



Typical Positive Encoder (Channel H shown) Fits standard 19" head-end rack.

with the negative system). Any number of single channel encoders may be connected to the head-end combiner. The multiple channel decoder traps required at the subscriber's TV set (corresponding to his selected menu) are now becoming available.

NEXT TIME

We'll discuss current ability of available traps to pass super, hyper and UHF bands. This is an important consideration, as CATV goes progressively wideband.

ACKNOWLEDGEMENTS

Thanks, again, to Carol Ryan, Chris Bostick, Dave Skeval, Steve McIntosh, Tony Potter, Rich Green (and any others I've inadvertantly overlooked) for their skilled and timely assistance. □

CATA '85 Opryland June 17 - 19

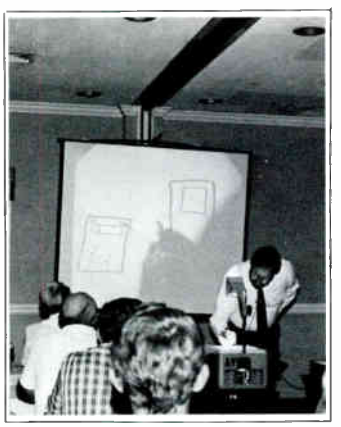
By:
Ellen Adams
Administrative Specialist, CATA

The 1985 CATA Annual Meeting and Exposition, scheduled for June 17-19 at the Opryland Hotel in Nashville, promises to be an exciting and valuable time for all. In addition to a great line-up of panels, hands-on demonstrations and consultants available in the exhibit hall, this year's program is sure to keep the spouses, other family members (over 12 years of age) and CATAkids (under 12) amused and entertained for the entire show. Convention-goers and their families will enjoy a Family Day on Sunday, June 16, where they will visit the historic Jack Daniels Distillery and a Tennessee Walking Horse Farm. Monday evening, June 17, CATA will host an Old South Party for all family members at an authentic ante-bellum mansion. A special luncheon and guest speaker will wrap-up the convention on Wednesday.

The CATA tradition will continue with educational panels dealing with the hot issues confronting cable operators today. There's sure to be many you'll want to attend and although there's nothing scheduled to conflict with these sessions, each panel will be taped and the cassettes made available for purchase since some panels will run concurrently. A topic that's sure to draw a large crowd is **Scrambling.** We'll look at the technical and marketing questions during two panels loaded with top notch people including Sid Topol from Scientific-Atlanta, Ed Horowitz from HBO, Bob Price from United Video and Holmes Harden from Canaan Communications. You'll want to plan on attending this one to clear the air on what's planned for scrambling, how you can be prepared and how to make the most of it. On another programmer related panel, we'll discuss **Controlling Programming Costs** with experts on vendor contracts and programming cooperatives.

The latest developments in **Low Cost Alternatives to Feed Forward** will be presented by representatives from Broadband Engineering, Magnavox CATV Systems, and Quality RF. Experts

CATA '85 Opryland June 17 - 19



from legal and technical fields will discuss how to test and measure for **Signal Leakage** and how best to handle your **Aeronautical Frequency Filings** (without pulling your hair out!).

Do you need information on **Making Your Advertising Dollars Work For You**? If so, be sure to hit the session on advertising needs and alternatives to meeting those needs with experienced people from Teltran, Turner Broadcasting System, and the Cable Advertising Bureau and MG Associates. If **Addressability/Pay Per View** (what's in it for you?) is a hot topic for you, come to this panel with Ike Blonder from Blonder-Tongue Laboratories and others from Jerrold, New York Times Cable and more. You'll want to be sure not to miss all the sound tips on **Effective Marketing — How and What to Market** from speakers from Cable Marketing Services, Cardiff Cablevision, Omega Communications and Metrovision.

The technical problems of, and some solutions to **Multi-Channel Sound** will be the focus of yet another panel. Also you'll be amazed to learn the variety of problems that can be solved by installing a **Computer Billing System,** whether you operate a small system or a large one — you'll have an opportunity to hear it straight from the people at Southern Wisconsin Cable, Massillon Cable TV, Toner Cable Equipment Co., and Great Lakes Data Systems.

If you've overlooked some of the small town markets, come get some tips for success during the session on **"Building a Small Town Cable System"**. During other panels and in the consultant's corner (an area set aside on the exhibit floor), you'll have an opportunity to discuss Franchise Fees, Pole Attachments and how to detect and solve one of our industry's biggest problems, Theft of Service. And of course, there'll be the Washington Update — a time to discuss what's ahead on S. 66 and copyright.

When the panels are not in session, come to the exhibit hall where you'll find an area set aside for hands-on demonstrations. There you'll have an oportunity to talk with those who really know the ins and outs of sweep generators and spectrum analyzers. You can ask all your questions and really discover how these instruments work and how you can use them to their fullest potential. ►

Save your shopping for the opportunity to visit with representatives of the following vendors who have to date reserved exhibit space at CATA '85:

Alpha Technologies, Inc.
Arts & Entertainment Network
Avtek, Inc.
Broadband Engineering, Inc.
C-Cor Electronics
Cablefacts
Catel Telecommunications
CBN Cable Network
Channell Commercial Corporation
Charles Green Associates
ComSonics, Inc.
Country Music Television
Daniels & Associates
The Disney Channel
The Drop Shop, Ltd.
Eagle Comtronics, Inc.
Eastern Microwave, Inc.
ECA/Manufacturing Division
ESPN
Great Lakes Data Systems
Group W Satellite Communications
Home Box Office, Inc.
Ind. Co. Cable TV, Inc.

CATA '85
Opryland
June 17-19

Larson Electronics
Lifetime
Lindsay America
M/A-Com Cable Home Group
Magnavox CATV Systems, Inc.
Midwest Communications
Northern CATV
Premium Channels
Quality RF Services, Inc.
Rainbow Programming Services
Regency Cable Products
Scientific-Atlanta, Inc.
Showtime/The Movie Channel
Southern Satellite Systems
Standard Communications Corp.
Studioline
Teltran, Inc.
Texscan Corporation
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Noise Temperature and G/T of Satellite Receiving Systems

by J. Searcy Hollis

(Continued)

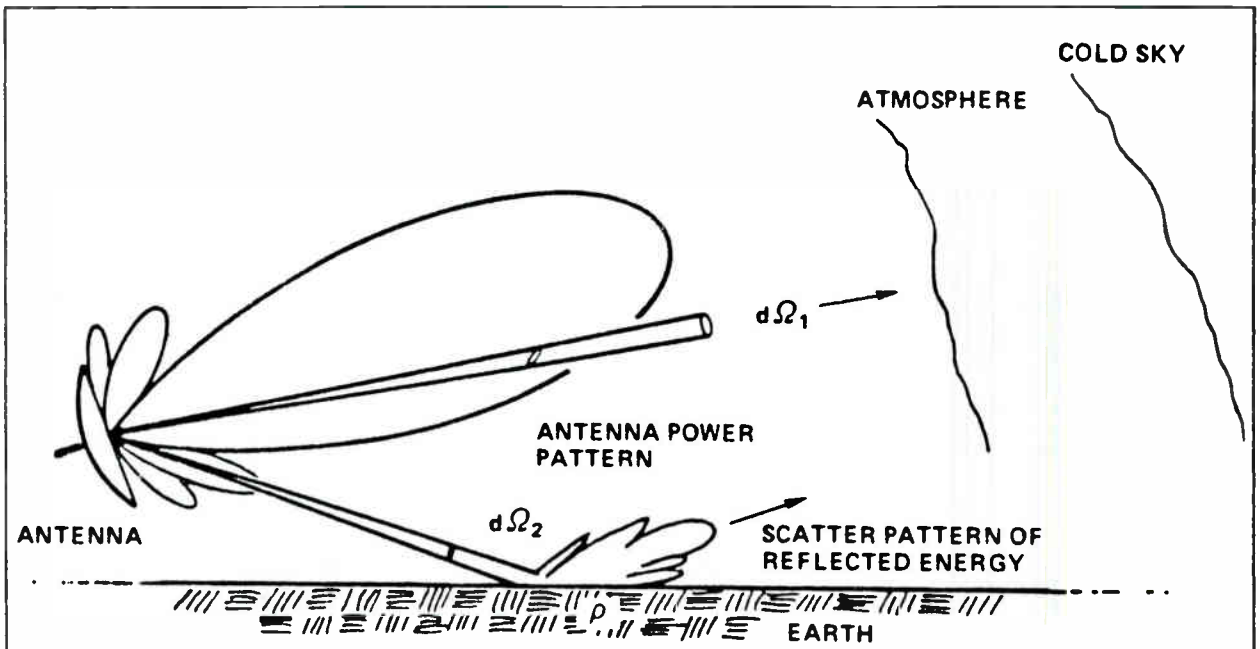


Figure 5. Simple Illustration Showing Basis for Equation Approximating Antenna Noise Temperature

Figure 5 is a simple illustration showing a power pattern super imposed on an antenna, which illustrates the concept of antenna temperature. In Figure 5 the antenna beamwidth is shown much wider than that of a typical satellite antenna. In practice the beamwidth will almost always be less than about two degrees and will often be less than 0.5 degree.

T_S is the value of an intergral Ω_3 over the sun's disk. It is approximately given by

$T_S = K \bar{G} T_{QS} G_T \; 4.75 \times 10^{-6}$ (for a quiet sun)

where

the factor 4.75×10^{-6} is the fraction of the celestial sphere by the sun's disk,

G=the average antenna gain over the sun's disk,

T_{QS}=equivalent noise temperature of the quiet sun ($10^5 K < T_{QS} > 10^6 K$)

C is a correction factor which applies when the beam pattern of the antenna weights the flux from the sun. Its maximum value is unity. When the main beam is directed toward the sun, its value is less than unity if the beamwidth approaches or becomes smaller than the angle subtended by the sun.

The antenna temperature is usually minimum at zenith, typically 15 to 20 degrees for a low-loss antenna with low wide-angle sidelobes. As the elevation angle decreases, the antenna temperature increases because more of the high-level sidelobes look at the earth, which has a temperature of about 290K. For smooth earth or water p tends to be small, especially at small grazing angles, decreasing the contribution of the second term of the integral over Ω_2. A typical curve of the variation of noise temperature with elevation angle is illustrated in Figure 6.

Available Gain. The available (power) gain G (available transmission factor) between an input port and output port of a linear transducer (two-port) is the ratio of the available signal power at the output port to the available signal power at the input port, as shown in Figure 7. It implies

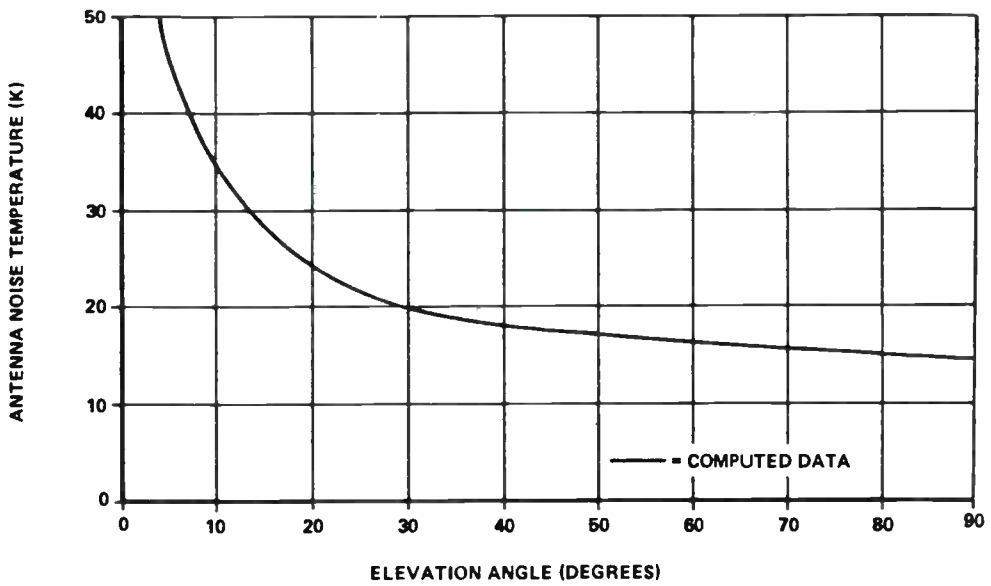


Figure 6. Typical Variation of the Noise Temperature of a Satellite Antenna as a Function of Elevation Angle

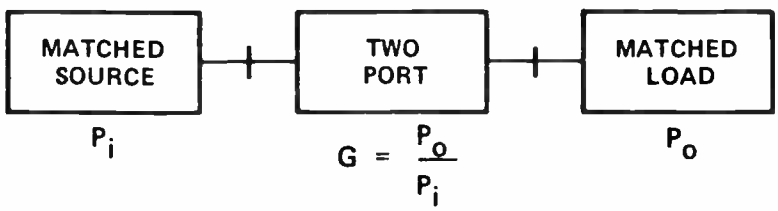


Figure 7. Illustration of Available Gain, G

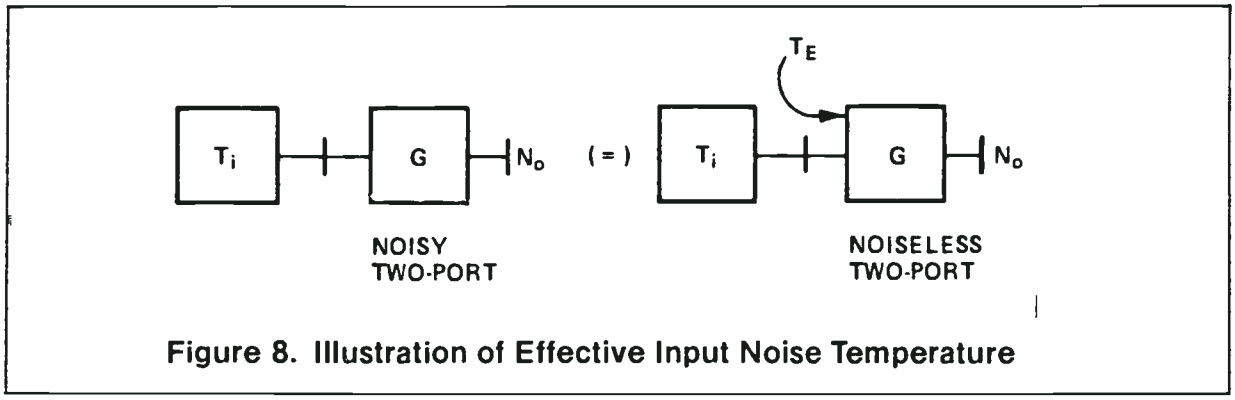


Figure 8. Illustration of Effective Input Noise Temperature

conjugate matches at the input and output of the two-port. For signal-to-noise ratios greater than unity, the gain for the noise will be equal to that for the signal.

The two-port can be an active device, such as an amplifier, or a passive device, such as an attenuator or waveguide. The gain of a passive device is always less than unity. Often gains less than unity are inverted and designated "losses." In the following sections we will **not** invert gains which are less than unity. This simplifies equations involving gains of cascades of transducers.

Gain can be expressed in dB or as a gain factor. For example, a matched amplifier with a gain of 20 dB has a gain G=100; a section of cable with a 3-dB insertion loss has a gain G=0.5. It is customary to omit the word "factor" when it is understood whether the gain is a factor or a number in decibels.

Gain is a point function of frequency. It involves **power** ratios in the case of a single-frequency signal; it involves power density ratios in the case of continuous spectrum, such as noise.

Effective Input Noise Temperature of a Two-Port. The effective input noise temperature of a two-port is a fictitious temperature which, when added to the noise temperature of a matched source connected to a matched noise-free two-port with the same gain as the actual two-port, will produce the same output noise-power density as the actual two-port, as illustrated in Figure 8.

The effective output temperature of a two-port is the effective input temperature multiplied by its gain G.

The Effective Input Noise Temperature of a Passive Two-Port. It can be shown that the effective input noise temperature of a passive two-port at a uniform physical temperature T_p is given by

$$T_E=\left(\frac{1-G}{G}\right)T_p \quad \bullet \quad (K) \qquad (5)$$

where G is less than unity for practical devices. For the theoretical case of a passive, lossless two-port, G=1 and $T_E=0$.

When G is zero, (5) becomes indeterminate. This is logical because the effective input noise temperature of a device with zero gain (infinite loss) is meaningless. In this case (5) is multiplied by G, and the effective output noise temperature is seen to the physical temperature T. The two-port is then simply a noise source of temperature T.

Noise Figure. The **noise figure** of a two-port can be defined as the ratio of the output noise power of the two-port with a 290K noise source connected to its input to the output noise power of a noiseless two-port with the same input noise source. From Figure 8 the noise figure is seen to be given by

$$NF=\frac{G(290+T_E)}{G(290)}=1+\frac{T_E}{290} \qquad (6)$$

The two-port can be active or passive, with a gain greater than or less than unity. Note that if the two-port adds no noise, the noise figure is unity. A two-port with a T_E of 290K has a noise figure of 2 (3 dB).

Noise figure is sometimes called **noise factor**. Some people prefer to use noise factor for the numerical ratio of (6) and noise figure for the then defined noise factor converted to decibels. The IEEE[2] has decided that the two terms are synonymous and can imply either the numerical ratio or the ratio in decibels.

Solution of (6) for T_E gives

$$T_E=(NF-1)\,290 \quad (K) \qquad (7)$$

The numerical noise figure

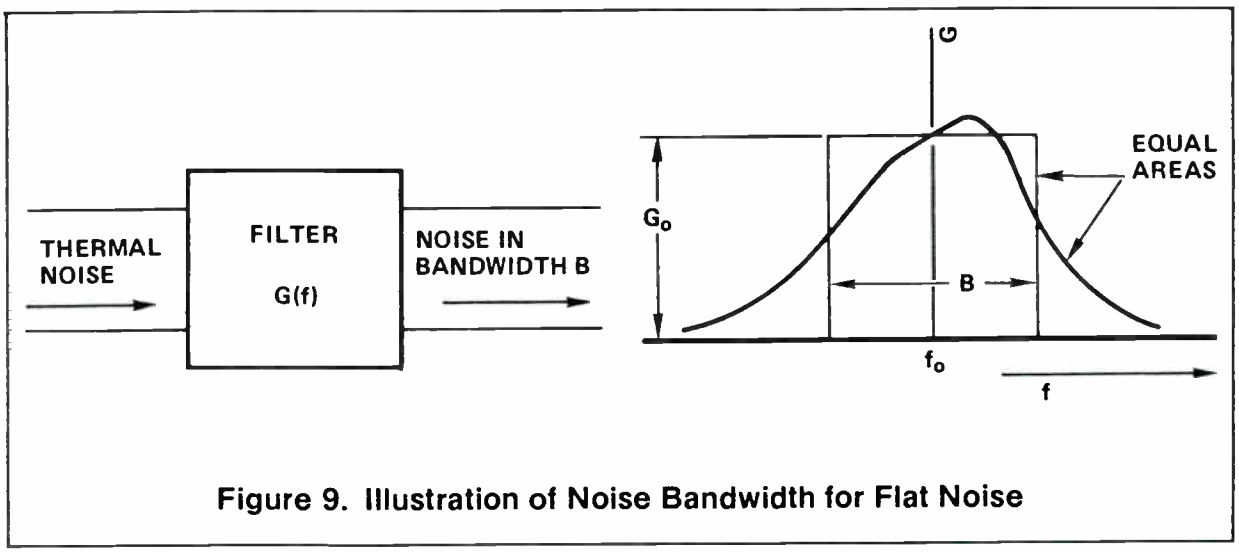


Figure 9. Illustration of Noise Bandwidth for Flat Noise

ranges from unity to infinity as the effective temperature ranges from zero to infinity. The noise figure in decibels ranges from zero to infinity.

The effective temperature expressed in decibels is not a true ratio; it has the dimensions of dB/K. See Appendix A of paper 1-2. It ranges from $-\infty$ to ∞, although an effective temperature of less than 1K (negative dB/K) is rare.

Noise Bandwidth. The noise bandwidth B of a receiving system is defined to be the bandwidth B of a rectangularly-shaped, noise-free filter with an available power gain G_o whose noise-power output is the same as that of the actual filter (see Figure 9). This is on the assumption that the noise-power density is constant with frequency. Thus

$$B=\frac{1}{G_o}\int_o^{\infty} G(f)df \bullet \quad \text{(Hertz)} \qquad (8)$$

The noise power output of the filter is given by

$$P_{NO}=kT_iBG_o=kT_i \int_o^{\infty} G(f)df \text{(watts)} \qquad (9)$$

where T_i is the available noise temperature at the input of the filter.

The noise bandwidth B is not a constant parameter of a receiving system. Its value depends on the choice of f_o, which in turn defines G_o in Figure 9. The definition of noise bandwidth assumes that the filter contributes no noise of its own. In practice every circuit contributes some noise. The definition of noise bandwidth assumes that sufficient preamplification exists to cause the filter noise contribution to be negligible. (See the next section, which discusses the noise amplifier cascades.)

System Noise Temperature

A satellite-communications receiving system consists of active and passive devices which, for the purpose of system noise temperature calculations, can be considered a cascade of linear two-ports. All these devices generate noise which combine to form the effective noise temperature of the cascade.

Consider Figure 10. It shows a cascade of two-ports fed by a source, T_{iO}, which is the antenna in operational situations. Every two-port in the cascade is characterized by a gain and an effective input noise temperature.

For the cascade of two ports of Figure 10, the total noise power at the output is given by:

$$P_O=kB[(T_{iO}+T_1)G_1G_2 \bullet\bullet\bullet G_N + T_2G_2 \bullet\bullet\bullet G_N + \bullet\bullet\bullet T_NG_N] \qquad (10)$$

where

k and B have been defined and

T_{iO} is the source temperature.

The total noise power referred to the input of the cascade (reference plane 1) can be obtained by dividing equation (10) by the total system gain, i.e.:

$$P_I=kB[T_{iO}+T_1+T_2/G_1+T_3/G_1G_2+ \bullet\bullet\bullet + T_N/G_1G_2 \bullet\bullet\bullet G_{N-1}] \qquad (11)$$

The factor within the brackets of (11) is the **operating noise temperature** or **system noise temperature** T_{S1} of the cascade* referred to plane 1:

$$T_{S1}=T_{iO}+T_1+T_2/G_1+T_3/G_1G_2+ \bullet\bullet\bullet +T_N/G_1G_2 \bullet\bullet\bullet G_{N-1} \qquad (12)$$

The effective input noise temperature T_{E1} of the cascade of ►

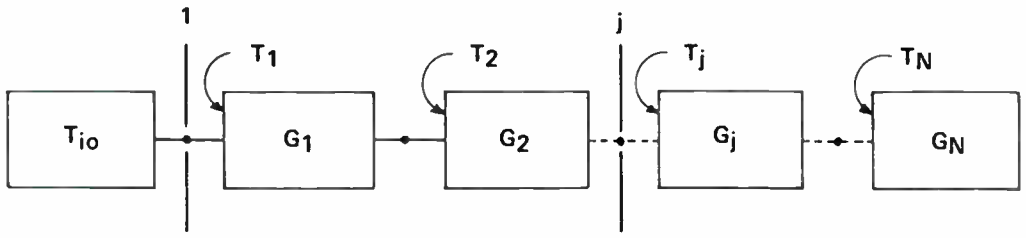


Figure 10. System Block Diagram Showing Cascade of Two-Ports fed by a Noise Source of Temperature T_{io}

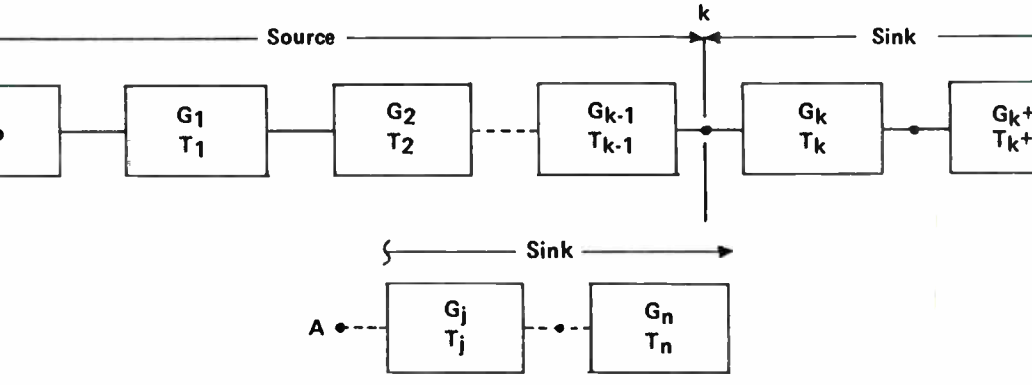


Figure 11. System Block Diagram Showing Definition of Noise Temperature at Reference Plane k

Figure 10 is defined by the system temperature at reference plane 1 **with the source temperature equal to zero:**

$$T_{E1}=T_1+T_2/G_1+T_3/G_1G_2+\bullet\bullet\bullet+T_N/G_1G_2\bullet\bullet\bullet G_{N-1} \quad (13)$$

It is often convenient to define a source temperature, an effective input noise temperature and a system temperature with reference to the k^{th} reference plane, as shown in Figure 11, instead of the first. For example, the k^{th} device may be the low-noise amplifier (LNA). With respect to this port, the cascade of devices to the left is the **source** defined at the k^{th} plane. The cascade to the right can be thought of as a **sink**.

**We prefer writing T_{op} instead of T_S, but will stick to convention and use T_S. The subscript "op" prevents confusion with "source", which can occur when T_S is used. The subscript "i" is used in this paper for "source" for the same reason.*

The source reference plane is transferred from a given plane toward the output of the cascade by (1) multiplying the source temperature defined at the first plane by the gains of the intervening stages and (2) adding the temperatures of each new source multiplied by the gain of the stages intervening between it and the new reference plane.

The source temperature defined at the k^{th} plane is then given by:

$$T_{ik}=(T_{iO}+T_1)G_1G_2\bullet\bullet\bullet G_{k-1}+T_2G_2\bullet\bullet\bullet G_{k-1}+T_{k-1}G_{k-1} \quad (13A)$$

The effective input noise temperature T_{Ek} of the cascade representing the sink is given by:

$$T_{Ek}=T_k+T_{k+1}/G_k+\bullet\bullet\bullet+T_N/G_kG_{k+1}\bullet\bullet\bullet G_{N-1} \quad (13B)$$

As shown in Figure 12, the total system noise temperature T_{Sk} with reference to the k^{th} plane is given by:

$$T_{Sk}=T_{ik}+T_{Ek}. \quad (14)$$

Application To Satellite Receiving Systems

System Temperature. In a satellite receiving system, the an-

tenna can be regarded as a source.

The system temperature is given by:

$$T_S = T_A + T_E \quad (15)$$

If there are waveguide and/or other devices between the antenna and the LNA, as shown in Figure 13, they constitute part of the source with respect to the reference plane k.

At reference plane k, the sink region consists of the LNA and all the devices which follow the LNA. With the exception of the antenna, all the devices are represented by their effective input noise temperatures. The antenna temperature can be defined at any reference plane. For example, it can be defined as a source temperature $T_{A'}$ at the antenna side of the waveguide run of Figure 13 or as a source of temperature $T_{A'}$ as the LNA input.

If it is defined at the antenna terminals by $T_{A'}$, the antenna temperature T_A defined at the LNA input is given by

$$T_A = T_{iK} = (T_{A'} + T_W)G_W = T_{A'}G_W + (1-G_W)T_p \quad (16)$$

where T_W and G_W are T_E and G of (5). The effective noise temperature of the sink referred to reference plane k is given by:

$$T_E = T_{LNA} + T_{CX}/G_{LNA} + T_R/G_{LNA}G_{CX} \quad (17)$$

The system noise temperature at the input to the LNA is given by the sum of (16) and (17). In the above, both G_W and G_{CX} are less than unity and G_{LNA} is greater than unity.

The Figure of Merit, G/T. The symbol G/T (dB/K) is called the **figure of merit** of a satellite communications system. It is defined by

$$G/T\ (dB/K) = G\ (dBi) - T_S\ (dB\text{-}K) \quad (18)$$

where G (dBi) is the sign of the receiving antenna defined at a given reference plane and T_S (dB-K) is the system temperature at the same reference plane. The reason for its definition as the figure of merit is given in the discussion which accompanies equation (15) in the paper "Principles of Satellite Communication."

An example of a complete receiving system is shown in Figure 14 in which both noise temperature and G/T calculations are illustrated. The following observations can be outlined:

a. The value of T_S is different at every junction.
b. The value of G/T (where $T=T_S$) is the same at every junction.
c. The system noise temperature

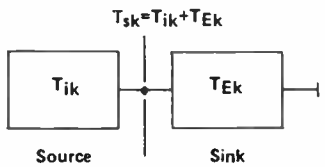


Figure 12. Cascade of Two-Ports Fed by Noise Source

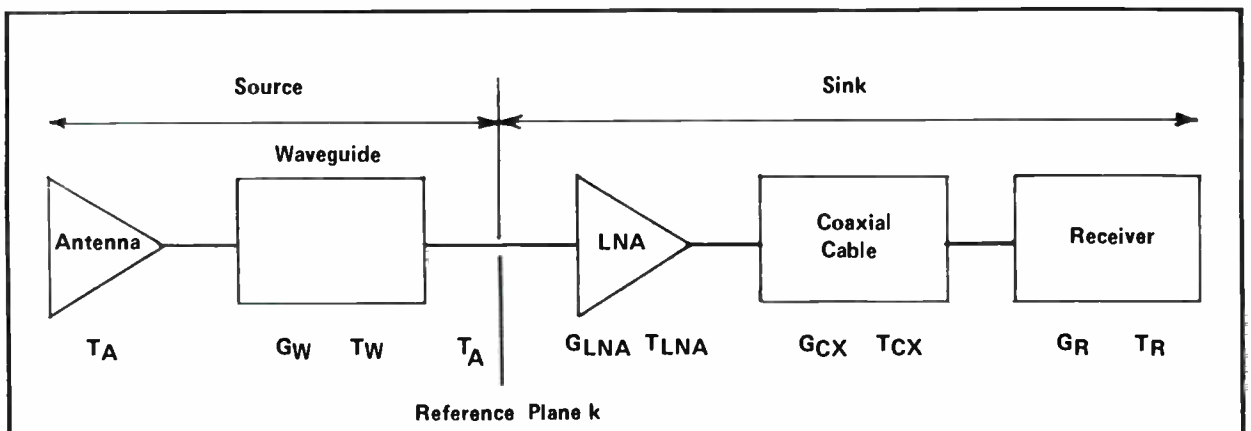
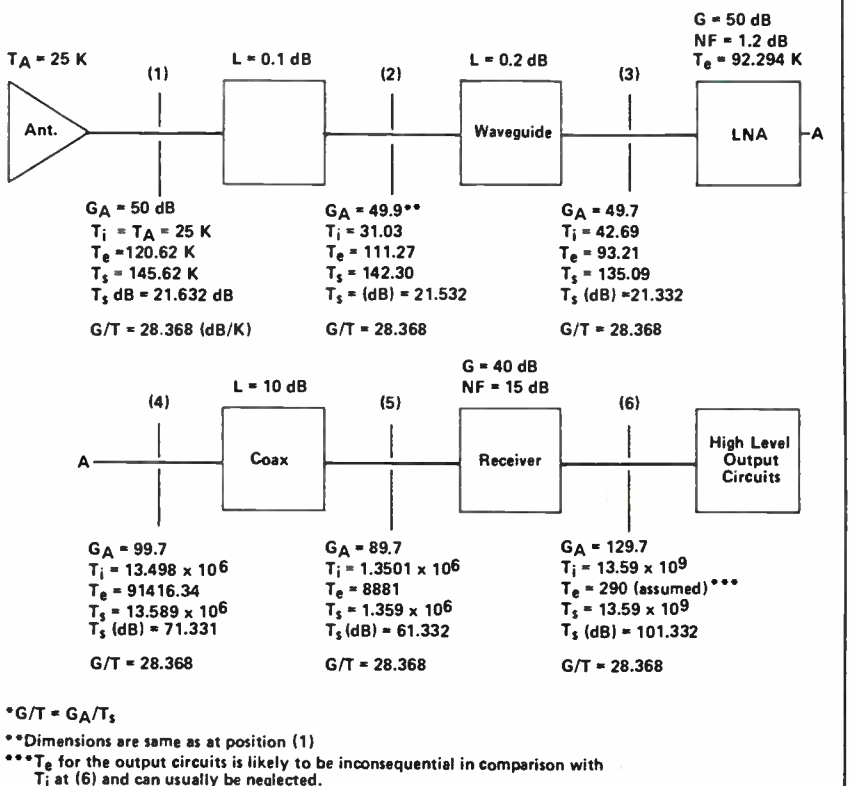


Figure 13. Block Diagram Representing Source and Sink Regions of an Antenna System.
Source and Sink are with Respect to Reference Plane k.

at the input to the LNA is influenced largely by the noise temperature of the components which precede the LNA and the LNA itself. The components which follow the LNA have a negligible contribution on the system noise temperature at the LNA input junction if the LNA gain is high.

The parameters which have a significant influence on G/T are the following:

a. Antenna Gain and Antenna Noise Temperature — See the discussion in papers 1-2 and 2A-1.
b. Antenna Elevation Angle — The lower the elevation angle, the higher the antenna noise temperature, and hence the lower the G/T for a given antenna gain.
c. Feed and Waveguide Insertion Loss — The lower the loss of these devices, the higher the G/T.
d. LNA — The lower the noise temperature of the LNA, the higher the G/T. The LNA must have a sufficiently high gain to suppress the noise contribution due to the components which follow the LNA. For example, in Figure 14, if the LNA has a gain of only 40 dB, then, at the input to the LNA, the value of T_S will increase to 144.1K. This means that system G/T will be reduced by about 0.26 dB. For a 30 dB LNA gain, the system G/T will drop an additional 1.96 dB.



*$G/T = G_A/T_s$
**Dimensions are same as at position (1)
***T_e for the output circuits is likely to be inconsequential in comparison with T_i at (6) and can usually be neglected.

Figure 14. Example of Noise-Temperature and G/T Calculations for Cascade of Two-Ports.
Note that G/T is independent of position in cascade.

Measurement of Noise Temperature

Measurement of T_E. The effective input noise temperature of any sink can be made by use of calibrated hot and cold noise sources as in Figure 15. In practice the sink is likely to consist of an LNA followed by a receiving system. The measurements are usually made with a radiometer or a commercial noise test set. If the device under test operates at microwave frequencies (such as a 4-GHz antenna or LNA), the noise is converted to 70 MHz and is bandlimited by a bandpass filter with a width of about 5 MHz.

When a sink is connected to two different noise sources, the ratio of the noise power outputs is called the **Y factor.**

If the effective source temperatures of two calibrated noise sources are T_H and T_C, and T_E is the effective input noise temperature of the sink, the resulting Y factor can be written

$$Y_1 = \frac{T_H + T_E}{T_C + T_E} \qquad (21)$$

From (19) T_E is seen to be given by

$$T_E = \frac{T_H - Y_1 T_C}{Y_1 - 1} \bullet \text{ (K)} \qquad (20)$$

Measurement of T_A. Measurement of the antenna temperature T_A can be made by the Y factor method, where the antenna replaces the cold load (see Figure 16).

The Y factor, which we will call Y_2, is given by

$$Y_2 = \frac{T_H + T_E}{T_A + T_E} \bullet \qquad (21)$$

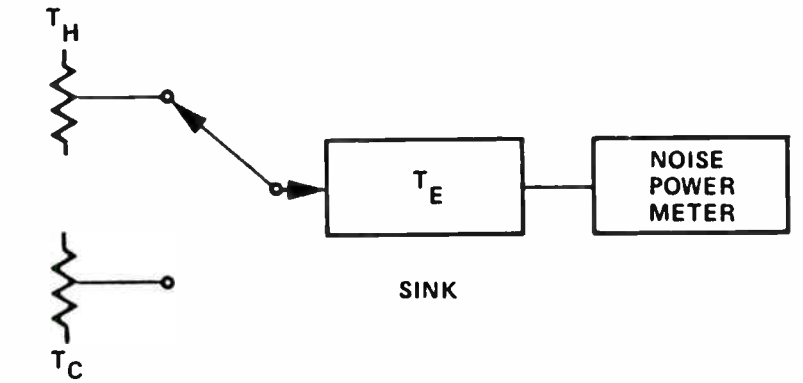


Figure 15. Setup for Measurement of the Effective Noise Temperature of a Sink

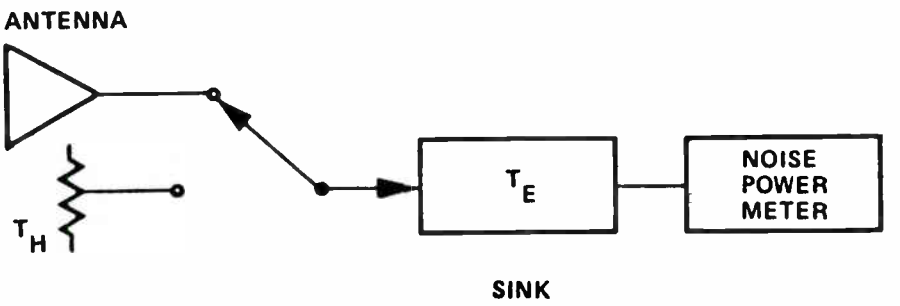


Figure 16. Setup for Measurement of Antenna Temperature

T_A is then given by

$$T_A = \frac{T_H - T_E(Y_2-1)}{Y_2}, \quad (22)$$

where T_E is known from (20).

Measurement of System Noise Temperature. The **system noise temperature,** also called the **operating noise temperature,** is given by (15); therefore, it is the sum of T_E from (20) and T_A from (22):

$$T_S = T_A + T_E \quad (23)$$

If a hot and cold load are both switched with the antenna as in Figure 17,

$$Y_1 = \frac{T_C + T_E}{T_A + T_E} \quad (24)$$

and

$$Y_2 = \frac{T_H + T_E}{T_A + T_E} \bullet \quad (25)$$

Simultaneous solution of (24) and (25) gives

$$T_S = \frac{T_H - T_C}{Y_2 - Y_1} \bullet \quad (26)$$

In this method it is not necessary to determine T_E directly.

MEASUREMENT OF G/T

For some applications, the G/T of an antenna system is required to be verified experimentally. There are several methods which are available for experimental verification. Some of the commonly known methods are as follows:

a. Both the antenna gain and the system noise temperature are measured separately and then algebraically combined to determine the system G/T. The gain is determined using a known gain standard on a suitable antenna range, and the system noise temperature is measured using known calibrated noise ►

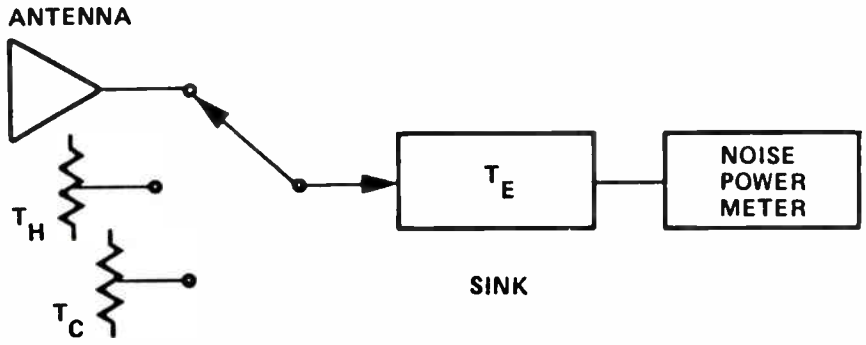


Figure 17. Setup for Measurement of System Temperature

b. Using a radio star with a known flux density, the antenna G/T can be measured directly,[3] or the gain and noise temperature can be measured separately.
c. The sun, the moon and some of the planets within our solar system can be used for direct G/T measurement.
d. A geosynchronous satellite whose EIRP is known can be used to measure G/T directly.

The indirect method requires that the gain of the antenna be measured at the same reference plane where T_S is measured. In this measurement, the uncertainty in the value of gain of the standard gain horn can prove to be a major limitation in the accuracy.

For satellite antennas used in the 4/6 GHz band which have diameters no greater than 11 meters, method (a.) is likely to be the most practical of the methods listed. Method (b.) can be used for antennas as small as 11 meters, but it requires extreme care and is expensive to implement. Methods (c.) have been described in the literature, but have a number of problems which tend to make them impracticable. For example, the extended size of the sun and moon and the variability of their radiated flux densities are specific problems. Method (d.) can be used as a rough performance check in comparing one receiving system against another, but it generally suffers in accuracy because of lack of precise calibration of the EIRP of most satellites.

Pertinent details regarding the G/T measurement using radio stars are explained in reference 10. For small antennas the use of a radio star for a direct G/T measurement can lead to a considerable error. Kreutel, et. al.,[8] have indicated that with Cas A the antenna system should have a G/T in excess of 3.54 dB/K in order to have a probable error of ±0.2 dB. Recently, NBS[9] has measured an antenna system (Scientific-Atlanta 10-meter antenna) with a 20.24 dB/K G/T at 2.26 GHz. Using Cas A, it was shown that the estimated error is ±0.3 dB. This type precision is in conflict with Kreutel's[8] predictions. However, NBS personnel are able to achieve a high measurement accuracy by utilizing an automated measurement system developed around a highly accurate power measurement bridge known as the NBS type II self-balancing bridge.

The accuracy of the determination of T_S and G/T depends on several factors. In measurements using noise sources, uncertainties in the the values of T_H and T_C, uncertainties in the Y-factor due to source level errors, amplifier nonlinearity, instability and jitter, and cascade mismatch errors are some of the prime factors which affect the overall accuracy. The various error sources are discussed in detail in several of the references, especially in 1, 3, 10, 11 and 12.

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WELCOME TO YESTERDAY . . .

Now being offered for a nominal cost is a new 24-hour programming service that will have appeal for **all** ages...**THE NOSTALGIA CHANNEL**. It is offering what you might think from its name...unique packages of classics which will include film classics, movietone-type newsreels, historic silents, early television masterpieces, big bands, and a full spectrum of memorable media events, drawn from a half century of the very best motion pictures and shows from television's Golden Era. This unique blend of programming will offer appeal to every demographic base: to millions of adults who remember those special times in their lives and the shows that recall them, the young with a fascination for the past and a sense of history, the dramatically rising audience of film and television buffs, and to the affluent audiences for whom memorabilia provides a constant source of fascination. From "Shoot 'Em Ups", Comedy Classics to visits with some of the Silver Screen's legends, this programming will return you to the days of hobbleskirts, fenderskirts, all the way to mini-skirts.

Broadcasting daily on COMSTAR D-4, transponder 10V, THE NOSTALGIA CHANNEL is headquartered in the Southwest. You can reach them at (214) 869-0877 or write them at: THE NOSTALGIA CHANNEL, Suite 225, Irving, Texas 75039.

VIDEO VACATIONS Premieres on SPN

Everyone from the yearly vacationer to the jet-setting international traveler will enjoy VIDEO VACATIONS, airing Fridays at 10 p.m. on SPN. In a lively, contemporary format, VIDEO VACATIONS is dedicated to giving cable viewers high quality travel and resort video presentations.

This program is particularly timely in lieu of the rapidly expanding travel and tourism industry, and will present excursions all over the world. The show entertains and educates, as well as providing updated travel bargains and resort development information. In addition, viewers will enjoy a full service worldwide travel and information service number to facilitate every travel requirement.

VIDEO VACATIONS is produced by Bob Crosby Productions in association with Sunset Entertainment, and enjoys the unique advantage of being an affiliate of TRC, an international resort and travel marketing organization.

Trip giveaways and call-in contests are just part of this innovative travel show that will take viewers from the sunny beaches of Waikiki to the majestic alps of Switzerland.

For more information contact Jill Carmen, 8101 S. Harvard, Tulsa, OK 74137, (918) 496-0101.

* * * * *

SPN VIEWERS SEE THE WORLD WITH TRAVELVISION

From the bustling streets of Paris to the ancient Mayan ruins of Mexico, SPN viewers will soon experience exciting resort locations all over the world through the new program TRAVELVISION, premiering in May on SPN.

Every Wednesday, 8:30 p.m., this half hour program will spotlight such fantasy vacation spots as the Virgin Islands, the Bahamas, Acapulco, The French Riviera, Jamaica, Bermuda, Cozumel, Rocky Mountain ski resorts, Athens, Tahiti, Vienna and Venice. TRAVELVISION offers a 12-15 minute featured destination along with several regular segments complementing the location. These will include shopping sprees (featuring the best buys, craftmanship, etc. of the area), photo tips, fashion shows (from resort wear to mountain hiking gear as would apply to the specific location), and travel tips (from visa and passport requirements to weekend packing in one carry-on bag).

Every 6 to 8 weeks the show will highlight an "Ultimate Escape" adventure. This unique vacation experience will include destinations such as an intimate lodge in Alaska accessible only by seaplane, an exclusive island paradise in the Caribbean or South Pacific, a guided trek through the high mountain meadows of the Himalayas in Tibet, and much more.

TRAVELVISION will also entice viewers with a weekly drawing for a free vacation for two to the show's featured destination. By sending in their names and addresses on postcards, SPN viewers will get a chance to win an exciting dream-come-true vacation.

For more information contact Jill Carmen, 8101 S. Harvard, Tulsa, OK 74137, (918) 496-0101.

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CNN CHRONICLES WWII VICTORIES

For millions of Americans, the coming months mark a special time in their lives and in the nation's history. It is the 40th anniversary of World War II's end in Europe and Japan. To commemorate the historic occasion, CNN correspondents Mark Leff and Mark Dulmage and correspondents abroad have compiled thousands of feet of World War II films, photographs, recordings and other memorabilia of the day, along with the memories of many who were there, into a daily newsreel-style report. As demonstrated below, the fast-paced reports are written to recap events both at home and on the battle fronts.

April 6, 1945. Franklin Roosevelt is a week into a vacation at his home in Warm Springs, Georgia, though officially, he's in Washington. Adolf Hitler is in his Berlin bunker, though allied intelligence thinks he's at Bertchesgaden. Part of the Soviet army is pushing toward Berlin through Eastern Germany. Moscow Radio is playing "Tales of the Vienna Woods," as the battle of Vienna begins and Soviet troops capture four suburbs. Parts of the left flank of the allied forces advance 30 miles — the ninth army just outside Hanover, the British second army not far from Breman, Canadian forces at Emden near the North Sea. The War Department announces American casualties are nearing 900,000. The big domestic news of the day — heavy flooding in Central Louisiana, the Army Corps of Engineers has troops and prisoners of war in the field to work on the levees.

The daily series of reports, "Countdown to Victory," began airing in April and will continue through August as the war in the Pacific concludes. "Countdown to Victory" may seen throughout the newsday on CNN including NEWSWATCH, airing weekdays from 5 PM to 6:30 PM (ET).

* * * * *

PAY-PER-VIEW????

Hoping to have plans finalized for announcement at the NCTA meeting June 2-5, several major entertainment companies have joined to formulate a national pay-per-view movie service. Among the prime companies involved in this plan are SHOWTIME and Paramount with other major studios also being involved, including Warner-Amex and HBO.

The plan would involve movies by satellite via a scrambled signal during the normal videocassette window and feature movies no less than three months and no more than nine months after release in the theater.

Cable operators are of the opinion that viewers are paying at least $2 to rent a movie videocassette, having to pick it up and return it by a certain time, and that those who are willing to do that would be willing to pay $2 to pay-per-view movie and stay at home.

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BET SWITCHING SATELLITES

The Black Entertainment Television network switched satellite in April, moving to RCA's Satcom III-R, transponder 20. The move was made from the Galaxy I, transponder 17, but is having no effect on BET's 24 hour programming schedule.

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A MUSIC PACKAGE FOR ADULTS

Under the name LIFESTYLE AC, the Seeburg Music Satellite Network has launched a new adult contemporary music service which will feature original albums and artists and top pop local hits, appealing to the 20-49 age group. This music service will add to audio packages and agraphics channels, playing music continuously and showing no commercials.

Seeburg reports that this new LIFESTYLE adult contemporary

Programming Notes
(Continued)

service on Galaxy I, TRNS 3, is now playing music selections mastered from laser-tracked digital discs as well as analog recordings. This is said to be the first such application of digital music in the commercial background/foreground music industry. The company states that it is giving precedence to digital over analog in its mastering.

Seeburg programmers state that the music from digital masters produces a product virtually free from distortion, with a frequency response of 20-20,000 Hz off the disc. The signal to noise ratio is 94dB, versus 60-65 dB for traditional analog music. Coupled with Seeburg's policy of mastering and rebroadcasting by satellite at 7 1/2 inches per second on broadcast-quality equipment (versus the 3 3/4 or 1 7/8 speeds used by other companies) digital mastering results in significantly greater music fidelity, presence and quality.

For more information, contact Seeburg Music Satellite Network, 5706 New Chapel Hill Road, Raleigh, North Carolina 27607, 919-851-5823.

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REAL ESTATE TO CABLE

The formation of the **Real Estate Cable Network** has been announced by a regional cable TV advertising interconnect, Cable AdNet Central. The real estate network will produce a two hour program of residential properties for sale in specific communities served by the RECN-affiliate cable television systems. This service debuted the first part of May to more than 58,000 households via two cable systems in Pennsylvainia.

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CNN TO ESTABLISH IN EAST AFRICA

CNN has established a bureau in Nairobi, Kenya, making it the first American television network to establish news presence in east Africa. This will enable CNN to cover all of Africa and parts of Southwest Asia from that location.

MONTHLY FEE CONSIDERED BY THE NASHVILLE NETWORK

Those affiliates whose contracts with The Nashville Network expire in May, 1986, may be faced with a monthly licensing fee for this basic cable service, now being offered to operators at no charge. Seen in 21.2 million U.S. households via more than 2,700 cable systems, the licensing fee would effect approximately 60 percent of its affiliates, the balance not being up for renewal until 1988.

If this plan is adopted, The Nashville Network would follow other ad-supported programming services that were first offered at no charge during their initial schedules and then subsequently charged licensing fees. With their ever-increasing program costs, programmers have presented these figures to justify their licensing fees.

In checking with TNN officials, it was learned that the fee would likely fall into the range of five to ten cents per subscriber per month. With this service being such a popular one and so highly regarded by subscribers, TNN felt the operators would feel that the service was well worth it to appease their viewers, and that the value of the service would uphold approval of the fee.

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"WE ARE THE WORLD" DEBUT

Home Box Office has obtained rights to an hour-long documentary of the video and recording session for "WE ARE THE WORLD", scheduled for May debut. This recording session brought together 45 of the nation's greatest music talents for individual and group performances of the song by the title name to raise money for an African famine relief effort. This documentary will contain the footage of the actual recording session with interviews by several of the artists. Sales of the record and video session are estimated to be near $200 million, with HBO donating their licensing fee to the USA for African Foundation. Directed by Quincy Jones, the chorale represents some of the biggest names in the music industry.

Programming Notes
(Continued)

NATIONAL CABLE FORUM TO SHOWCASE PROGRAMMING FOR TELEVISION CRITICS ASSOCIATION

The National Cable Forum (NCF), comprised of the top eleven cable television programming networks, announced today its participation in the Television Critics Association 1985 Summer Press Tour. The NCF program will be held May 30 through June 1 at the Arizona Biltmore Hotel in Phoenix.

Four year veterans of the press tour, the NCF networks will offer the TV critics the opportunity to interview program executives and celebrities appearing in upcoming made-for-cable programs. "This event supports the interests of the entire cable television industry," said Char Beales, National Cable Forum chairwoman. "The columns that will be generated as a result of this NCF event will heighten consumers' awareness of the unique programming options available on cable television and, therefore, stimulate the demand for cable and increase viewership."

The National Cable Forum will showcase the following programming networks: Arts & Entertainment, CBN Cable Network, The Disney Channel, ESPN, Home Box Office, Lifetime, MTV Networks Inc., The Nashville Network, Satellite Program Network, Showtime/The Movie Channel, Turner Broadcasting System and USA Network. These networks will present the most current information on the cable television industry and showcase upcoming 1985 programming.

The event agenda:

MAY 30:

Press Conferences by: (in order as listed)
- The Disney Channel Breakfast and Conference
- Satellite Program Network

Basic Services/Press Lunch

Press Conferences
- ESPN
- USA Network
- Arts & Entertainment
- The Nashville Network
- MTV Networks Inc.

MTV Networks Inc. Event

May 31:

Home Box Office Press Conferences and Event (entire day)

June 1:

Press Conferences by: (in order as listed)
- Lifetime Breakfast and Conference
- Showtime/The Movie Channel

Showtime/The Movie Channel Lunch

Press Conferences
- CBN Cable Network
- Turner Broadcasting Systems, Inc.

Turner Broadcasting Event

Arranging the 1985 event are the National Cable Forum committee members: Burt Berlinger, Arts & Entertainment; Earl Weirich, CBN Cable Network; Hella Asch, The Disney Channel; Rosa Gatti, ESPN; Judy Torello, Home Box Office; Al Husted, Lifetime; Don Bridges, MTV Networks Inc.; Cheryl Daly, The Nashville Network; Stuart Ginsburg, Showtime/The Movie Channel; Arthur Sando, Turner Broadcasting System, Inc. and Barry Kluger, USA Network.

The Television Critics Association consists of 130 members from newspapers in major markets across the country.

The National Cable Forum, a non-profit organization, was founded in 1984 and consists of nationally distributed basic and pay satellite networks.

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NATIONAL GEOGRAPHIC MAGAZINE TO BE OFFERED ON CABLE

The National Geographic Society has begun to offer cable viewers a weekly three-hour electronic magazine, offered as a block from 5:00 p.m. - 8:00 p.m. (ET) every Sunday on Nickelodeon.

This effort will consume more than 75 hours of unduplicated programming, the majority of which is new material. The NGS electronic magazine will bring its programming to the 25 million cable subscribers who presently receive Nickelodeon. The material is geared for the entire family, with emphasis on a variety of subjects. Segments will be of various lengths, some as short as 15 minutes, with an average of five to ten different segments in each three hour presentation. Much of the material presented will be adventure segments produced by independent film makers, aside from the National Geo-

graphic Society. Some thirty educational non-profit institutions, from zoos to museums, etc. have joined to provide material for this "Explorer" program.

This "Explorer" series will be advertiser supported, with the NGS handling the advertising package in-house, and expectations are running high for the acceptance of this regular programming, both by the advertisers and the cable viewers.

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TLC TO CABLECAST "MAIN STREET AT WORK: THE FOUR POINT APPROACH," PROGRAM AVAILABLE TO ALL SYSTEMS

The Learning Channel (TLC) will join the National Trust for Historic Preservation in celebrating National Preservation Week, May 12-18, with the cablecast of **Main Street At Work: The Four Point Approach.** The half-hour program will be shown by TLC at 11:00 am, Tuesday, May 14 with repeats at 11:30 am Wednesday, 2:30 pm, Friday May 17th and at 3:00 pm Saturday May 18th (all times ET).

Preservation Week, an annual celebration of the National Trust, highlights downtown revitalization with the theme, "The Action's Back on Main Street." The National Trust's National Main Street Center, established in 1980, has assisted more than 140 communities, the first 30 of which have realized $148 million in reinvestments in their downtown areas. **Main Street At Work: The Four Point Approach** will introduce viewers to the comprehensive process that emphasizes the key elements of organization, promotion, design and economic diversification.

Main Street At Work: The Four Point Approach is the introductory program in a series of four developed by NMSC as a guide to public officials, business people and citizens interested in rejuvenating their downtowns with an eye to economic development. This special program also will feature J. Jackson Walter, president of the National Trust, and Scott Gerloff, director of the NMSC, who will discuss resources that communities can tap to stimulate re-investment in their Main Streets.

The program follows the highly successful videoconference, **Revitalizing Downtown,** produced and cablecast for the NMSC by The Learning Channel last fall. More than 25,000 people in 450 communities participated in the live videoconference which was designed to assist communities with downtown revitalization projects. "So far as we've been able to ascertain, it was the largest single videoconference ever held. Just as important, it was an impressive example of how cable and cable technology is helping disseminate valuable and practical information to special interest audiences," TLC Harold E. Morse said.

Additional information on the availability on the entire Main Street at Work series, and on the condensed version of the videoconference is available from the National Main Street Center, National Trust for Historic Preservation, 1785 Massachusetts Ave. NW, Washington, DC 20036.

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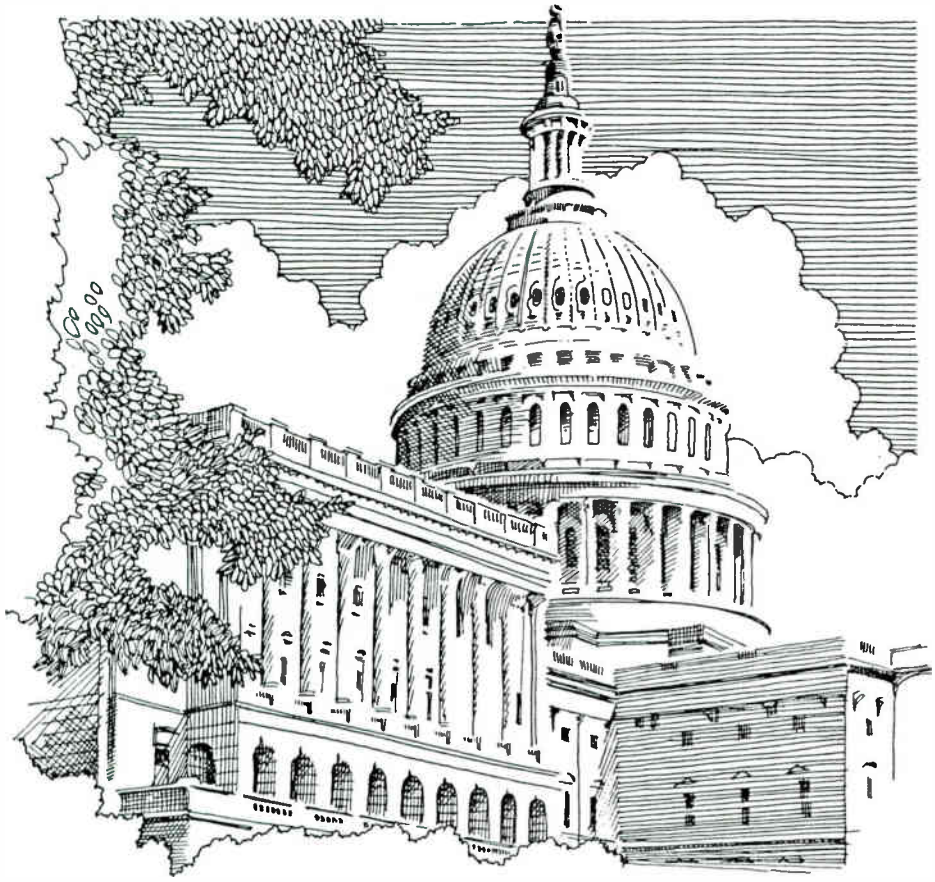
W.a.s.h.i.n.g.t.o.n U.p.d.a.t.e



by
Stephen R. Effros
CATA's Executive Director

SCRAMBLING — AN ABSOLUTE MUST!

The Community Antenna Television Association is strongly urging all of its members individually to support only those cable programmers who scramble their satellite delivered signals — and scramble them right now! At its Board meeting in the beginning of February, the CATA Board Members reviewed the situation of home earth terminal theft of cable satellite services. Of course, by then it was not "theft", under the law — S.66 allows home users to look at programming that has not been scrambled, or programming that is not being directly marketed to home earth terminal users even if it is not scrambled.

The solution to the problem of someone else getting the product that we pay for for free is scrambling. There is simply no question about that. But for some reason that scrambling is coming very slowly — if at all. Many segments of the cable industry have noticed this seemingly odd reluctance on the part of the programmers to scramble, and resolutions have been adopted by many state and regional associations to the effect that the programmers are "urged" to scramble as "soon as feasible".

That was simply not good enough for CATA. The programmers are dragging their feet in an effort to achieve marketing position as the sole distributors of scrambled packages of programming. They are blaming almost anything they can find for the reason they are not moving more swiftly. First it was said that the equipment was not working right. That is not true. The equipment, according to our sources, is working. It is true that about five to ten percent of the home terminals will not work — but that's the "cheapo" dish-owner's problem, not the fault of the equipment. It is also true that there are some temporary "glitches" caused by some headend gear having to be retrofitted —but that is being actively worked on too.

The latest excuse is that scrambling cannot really take place until a full marketing scheme is in place to provide the descramblers to the home market! This is true, so the arguement goes, because the programmers and suppliers will be sued if they do any less. Well, that's downright silly. First of all there is nothing in the new cable law that requires sales to the home in the first place — in fact Rick Brown and his SPACE crew are on Capitol Hill right now trying to get a new law through Congress that would, for the first time, mandate home sales. Another ploy is to get a bill that would prohibit scrambling for two years while marketing was put in place. The introduction of both bills clearly indicates that THEY don't think the current law requires an immediate marketing program for the home user, so why are the suppliers so afraid of a suit? The fact is that some sort of suit from SPACE is inevitable. It is a classic delaying tactic, and should be expected no matter what the suppliers do. Clearly, that is not the real reason for the delay.

So why is all this happening? Because the big boys see a potential market out there of home users, and they want to be in the "right" position to take advantage of it. Some are maneuvering to be the main distributor, controlling the addressable computer that will in turn control all the home boxes nationwide. Others simply don't want to be the first one to scramble — they think that will hurt their "image" with home users.

Well, we think it has to be made as clear as possible that they are now destroying their image with the cable operators around the country who are still expected to pay for product that the suppliers are literally giving away free to other folks! We don't see how that is fair, and we don't see how the suppliers can expect us to continue to put up with it! Most cable contracts have an obligation on the part of the operator to protect the programming from theft. It seems to us the same obligation flows the other way as well!

We are not recommending any immediate concerted action on the part of cable operators — after all, you all have your own contracts and your own priorities. But one thing is clear: those program suppliers who move **NOW** to scramble (and not just talk about it — actually do it!) deserve support. Those who do not, don't. Let them go market to the million or so home earth terminal folks. We have been discussing this problem with many segments of the industry lately to see where things stand. We are now being told — and this was stated in a recent public seminar, that our complaints should be satisfied by some impending announcements in the next few weeks. We certainly hope so! Of course, announcements do not mean much unless they are followed up by action, but at the very least if the public sees that the program suppliers are serious about an immediate plan of action to scramble, they will consider with a little more caution the wild claims of the home earth terminal sales folks!

In that context, CATA is also looking at the flip side of this problem — that loads of innocent consumers are being duped by "small earth terminal and storm door" salesmen into thinking either that scrambling will never really happen, or that Congress has prohibited it, or that they will be able to buy a cheap little "black box" and descramble the signals and continue to get the programming for "free". Some of the sales pitches we have heard about are truly astounding. There even appears to be an effort by some of these folks to imply that Senator Goldwater backs these assertions of the right to steal — even scrambled signals! That's consumer fraud — and we think the public should know about it! Some advertising has already been placed in local newspapers warning about this kind of fraud. The problem is that the local rip-off artists are getting extra publicity from the ads and they simply lie to people to perpetuate the fraud! We are trying to determine right now whether on balance it is better to start an ad campaign like that or not. If the answer is yes, then CATA will have available photo-ready ad slicks for you to use if you want them. Stay tuned. In the meantime, let your program suppliers know what you think about this situation. And let them know in no uncertain terms!

Please note that one of the major focal points of the CATA Show in Nashville on June 17-19 will be on this issue. We have some of the big guns, both on the technical side and the marketing side coming down to explain their positions on scrambling. As usual, we will be in an "open forum" format, so you can get your views across right there and then. It should be interesting.

SMATV THEFT
continued

As promised in the last two issues, we are including in this issue a sample of the type of letter you can send to SMATV/condo/apartment house type folks who have put up small earth terminals and are taking programming without contracts with the programmers. In this area we are clearly on a roll. There are several cases now that have been brought, with the help of the programmers (let's give them credit when credit is due, just as we yell when there is something to yell about!), where SMATV folks have been forced to stop carrying illegal programming and have hefty fines imposed. The provisions of S.66 in this regard, as we explained in a previous issue, are very clear, and very helpful. Frank Lloyd, of the law firm of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo (202-466-

SAMPLE CABLE OPERATOR NOTIFICATION LETTER RE VIOLATION OF SECTION 705 OF COMMUNICATIONS ACT

Dear (SMATV operator, condominium association, hotel, motel or bar owner):

It has come to our attention that you intercept the satellite transmission of the following satellite cable programming: (_____). We have contacted the supplier of this programming, and have been notified that you are not presently authorized by the supplier to receive these signals.

It is a violation of federal law under Section 705 of the Communications Act of 1934, as amended by the Cable Act of 1984, to intercept this programming without the permission of the supplier. (A copy of this law is enclosed with this letter.) Your interception and use of these signals constitutes a willful violation of federal law for commercial advantage and private financial gain. This violation is punishable by any or all of the following, in addition to a court order to cease carrying these programs:

(1) Imprisonment for up to one year and fines of $25,000 for a first conviction (and up to two years and $50,000 for each subsequent conviction);

(2) Actual damages suffered by the suing parties, and any profits you make on the interception, or statutory damages for each violation of up to $10,000, plus punitive damages of up to $50,000; and

(3) Recovery by the suing parties of all their costs of litigation, including their attorneys' fees.

Both the supplier and this cable system have the right to bring an action against you for violation of this law. A copy of this letter is being sent to (the program supplier).

We expect that you will immediately desist from further unlawful interception of these signals.

Sincerely,

(Cable Operator)

cc: (Program Supplier)
Enclosure
04401

5479) helped us out by drafting the sample letter. He is also one of the ones responsible (along with former FCC Chairman Ferris) for the three-volume "Cable Television Law" set published by Matthew Bender. As we have mentioned in the past, that set, while expensive ($210), probably has everything you will ever need to know about cable law in it — and lots you will never need to know. It has sample franchise provisions, explanations of all the laws, and a complete analysis of S.66. They also update the volumes twice a year (for a fee, of course). It is a book that every operator who has to deal with city attorneys should have! If you want more information, give the CATA office a call.

Anyway, back to the issue of SMATV theft, you now, with this issue have a sample letter as well as the copy of Section 705 of the law which was published in the March issue. That should put you in very good shape to go talk to these folks who are skimming the signals from the satellite. Once you have, you should contact the local area reps for the program services and see if the use of the signals is legal or not, and ask for their assistance in sending letters and in legal action, if that is necessary. CATA has contacted several of the major programmers to get additional names of folks to contact, and here they are; Showtime/The Movie Channel: either Carl Sambus (212/708-1558) or Matt Riklan (212/708-1558) HBO: contact local affiliate rep. United Video/WGN: Bob Price (800/331-4806) SSS/WTBS: Paula Coyne (918/481-3275) USA: Steve Brenner (201/445-8550) ESPN: local rep. We are urging all of the programmers to give us a specific name and telephone number for operators to call in an effort to centralize these actions and make it easier for everyone to keep track of them.

One last thing on the theft of service issue. And this one does not apply to the SMATV problem as much as it does to straight old ordinary theft of cable service which is now clearly illegal under federal law. Suburban Cablevision in New Jersey just shared with us the news release packet that they sent out to all 45 or so of the towns in which they operate. The material went to the Mayors, city council folks, local newspapers, etc. and included all sorts of information on theft of service. What caught our eye was a copy of a very simple newspaper ad that said — in very big bold print — "GO TO JAIL FOR 6 MONTHS. PAY A $1000 FINE." and in smaller print explained "Those are the penalties you could face if you're convicted of stealing cable service. And in the Suburban Cablevision area, 87.5% of those caught are convicted. The odds are against you. The penalties are stiff. It's not worth it." Of course they also had a big logo and telephone number in the ad. It's well done, and simple. Think about it.

INDUSTRY REACHES AGREEMENT ON COPYRIGHT INFLATION ADJUSTMENT

As we mentioned last month, the various industry groups have agreed on an inflation adjustment for copyright payments. Why? Because the law says there can be an inflation adjustment once every five years and we litigated what the formula for that adjustment should look like last time. So the choice this year was to either go through the whole painful and expensive process again, only to have the courts reiterate the formula they have already approved, or simply sit down and agree on the numbers to put in the formula. We all chose the latter course. CATA, NCTA, MPAA, NAB, Sports interests, and lots of others all signed on to the agreement. In essence, what we agreed to was that the total inflation factor for the past five years has been 36.5% and that basic rates have not kept up with that inflation rate. We fell about 11.8% behind. Thus, the copyright fees get hiked by 11.8% according to the law, and the "trigger" numbers,, for when you go from a "Form 1" to a "Form 2" system,, or from "Form 2" to "Form 3" go up by 36.5%. Here are the new numbers that have been proposed. They have **NOT** been approved yet — there still has to be a formal comment period. (See diagram on following page.)

Please note that these figures do not include the syndicated exclusivity surcharge that applies in the top 100 markets. That surcharge

CURRENT:	PROPOSED:
FORM 1 If semiannual gross receipts are less than $55,500, fee is $20.00	FORM 1 If semiannual gross receipts are less than $75,800, fee is $28.00
FORM 2 If semiannual gross receipts are $55,500 — $214,000, fee is .5% of first $107,000, 1% for remainder	FORM 2 If semiannual gross receipts are $75,800 — $292,000, fee is .5% of first $146,000, 1% for remainder
FORM 3 If semiannual gross receipts are more than $214,000, then fees are based on DSE's 1st DSE @ .799% of gross basic 2nd, 3rd, 4th DSE @ .503% 5th or more @ .237%	FORM 3 If semiannual gross receipts are more than $292,000, then fees are based on DSE's 1st DSE @ .893% of gross basic 2nd, 3rd, 4th DSE @ .563% 5th or more @ .265%

was not a subject of this agreement or this particular proceeding. At the moment the surcharge remains .599% for the first DSE in a top 50 market and .377% for each additional DSE, and in the second 50 markets it would be .300% for the first, and .189% for each additional DSE.

As we have repeatedly said, we think this whole thing is needlessly complex and while we are actively working on a new "inequities" bill, similar to our efforts with Mr. Kastenmeier and Mr. Synar last year, we are also discussing with all the other parties if there isn't a way we can simplify and codify this entire process so we can all go about our business. Those discussions are still at the preliminary stages, but we will definitely keep you informed. The "inequities bill" is in the drafting stage right now and we expect that it could be floating up on Capitol Hill within a month.

Finally, on the issue of Copyright, is the note that Ted Turner's legal beagles have filed a petition before the CRT to get WTBS out from under the 3.75% rate decision. The basic claim is that WTBS can show that it is paying more for the same product than are other similarly situated television broadcast stations, and the reason they are is that the syndicators are selling to them, taking into account the value of WTBS cable carriage. Once that is proved, the thinking goes, there is no reason for the syndicators to knowingly be getting two bites of the apple through the 3.75% penalty fee. CATA agrees with the basic thrust of what Turner is trying to do even if we do not specifically like the wording of the proposed new rule (it is too limited, in our view). We will support the concept when it comes before the CRT — but that might not happen until the fall, since the Tribunal must first deal with the distribution of money it has already collected under the law, and the various parties in that dispute are going at each other's throats right now — it will be a long proceeding.

FCC NOTES

Still no word on the "effective competition" rulemaking — it will be decided and announced sometime later. Watch the trade press for the decision and we will explain what it means to you in subsequent issues.

On other fronts, as you should know by now, the Commission has decided NOT to require cable to carry multichannel sound at the present time. It's a good thing, too. No one really knows yet how that technology will go over with the public. It seemed silly to require us to carry something that so few people, at least right now, indicate any interest in! The Commission will re-look at the issue in a year or so.

Another thing they are looking at again right now is their decision in the Orlando/Melbourne Florida market to extend the market for the purpose of the "must carry" rules. The market has now been stretched so far that there are systems over 110 miles away from a broadcast station being required to carry that station on the premise that it is "local" and, therefore, the local programming must be preserved for the "local" viewers! It is really too foolish for words. Some operators, if this decision stands, will have to use microwave to bring in an unavailable "local" signal! Contrast that with the fact that, for instance, the Commission's rules say that the Baltimore, Md. signals are "distant" to the Washington, D.C. market which is less than 35 miles away!

To be honest, we sort of like the idiocy that is going on at the

Commission right now with regard to the extension of the "must carry" rules. It is excellent fodder for the court cases coming up that challenge the whole notion of "must carry". We firmly believe that one of those cases will be won, soon. That will be the end of all this nonsense.

On a more serious note, the Commission has proposed a set of fee schedules to Congress for all of the industries, and rules the FCC is in charge of. For cable, registrations would cost $25, CARS licenses $60. An assignment and transfer would be $450, and a TVRO license (which is optional) $675. The worst idea they came up with was a fee of $700 — the highest for cable operators, for filing special relief petitions.

Now there are really only two special relief petitions left. One is for must carry, and the other is for nonduplication protection. In both cases the main reason to file one is that the operator does not have the money to build out the system to accommodate the request — in other words it is an economic hardship waiver. The Commission is now proposing to make it an economic hardship to file an economic hardship waiver! We have notified Senator Goldwater and Rep. Wirth — who head the two subcommittees looking at this proposal of our concern. All the subcommittee members also got a note about it.

Speaking of FCC proposals, there's another one floating around that should make all cable operators sit up and take note. In the new budget requests the Commission is asking for 17 more staff people because of the added work the Commission sees itself taking on in the wake of S.66. Most of those new folks are earmarked for EEO enforcement! A word to the wise —

STUDIOLINE — A STANDARD OF EXCELLENCE

Anyone questioning the logic of the FCC decision to propose the elimination of the technical standards because the industry far exceeds them anyway should take a tour of the new STUDIOLINE audio service facilities just outside Washington, D.C. STUDIOLINE will shortly begin offering specialized audio services to the cable industry. The audio channels will be sent via satellite and there will be special decoders in the homes of subscribers. This is an audio pay service. So far nothing really new — other folks have tried that before. What is stunningly different this time is the almost manic insistence on quality. CATA Executive Director Steve Effros, who is also a known stereo nut, took a tour of the facilities and came away in a daze. The quality of the equipment and the knowledge of the people using the equipment to put together the programming is, according to Steve, second to none. Cable will be able to have audio service that rivals the quality of home compact disks! Here's hoping the marketing and pricing of the product turn out to be as good as the technical preparation — it could be a very interesting new selling point for cable operators nationwide. The problem, of course, as always, is that quality doesn't come cheap. We'll have to wait and see what happens — if you are in Washington, though, treat yourself and make and appointment to see the STUDIOLINE facilities. The STUDIOLINE folks will also be at the CATA Show in Nashville, so you might want to check in with them there if you are interested in learning the latest about transmission of quality audio signals.

BUYING CO-OP UPDATE

We know we have been telling you for months that CATA and the MidAmerica Association were supporting the legal cost of looking into the creation of a cable buying co-op, and that lots of you have called asking for details and we have had to put you off. Well, the wait is almost over. A CO-OP has been formed. Its formal name, for lots of reasons we won't (and probably don't have to) go into here is the "MidAmerica National Cable Television Cooperative, Inc." The MidAmerica, CATA, and NCTA groups, however, have nothing formal to do with the co-op, which, from now on, we will simply refer to as the "Cable CO-OP". It is an independent organization, and you will simply have to trust our word for the fact that it was darn complicated to set up, and it appears to be even more complicated to get it under way. There are lots of details that have to be worked out. The work, to date, has been done largely by Rob Marshall of the MidAmerica Association. But that will soon change. Over $90,000 in initial

dues to belong to the COOP has already been pledged. Yes, it is going to cost to belong — these things are expensive to put together! The first thing that will be done is the appointment of an Executive Director. After he or she is on board, formal mailing addresses and application forms along with fee schedules will be developed. We hope that by next month an announcement of all of that stuff will be forthcoming. Hang on a little longer.

SHORT TAKES

THE CABLE INDUSTRY AND "JERRY'S KIDS"

The CATA Board has endorsed a resolution supporting cable industry cooperation with the Muscular Dystrophy Association to raise funds for "Jerry's Kids". Of course, that refers to Jerry Lewis and the MDA telethon which, this year, will have tie-ins to cable promotions nationwide. The MDA is working with both CATA and the NCTA, which has similarly endorsed the effort, to develop material for distribution to cable operators for promotional sign-up programs or upgrade programs linking subscriber action with donations to MDA. We will have more information on this in the near future. Those systems that worked on a similar program last year report that it was very effective both for the cable operators and for MDA, thus, this year we are making it an industry effort.

THE NATIONAL MUSEUM OF CABLE TELEVISION

Penn State will be the formal site of a national museum of cable television. Penn State officials have now formally agreed to house the museum and oversee it under the direction of a Board comprised of University officials and cable executives. The cable groups involved in the setting up of the museum are CATA, the NCTA, The Cable TV Pioneers Club, and the Pennsylvania Cable Television Association. Bob Tarlton represents CATA on the Board. Ed Allen is the NCTA rep; Ben Conroy, who has been named Chairman of the Board, and Sandy Randolph represent the Pioneers, with Joe Gans as the PCTA voice. Milt Shapp has been named honorary chairman, and George Barco, one of the founders of the concept, is an ex officio member of the Board. With that group of quality people, there is every expectation that this will be an excellent opportunity for the cable industry to collect, study, and display its heritage with pride. We will be asking you to donate your "historical" (and now, sometimes looking back on it, hysterical) cable memorabilia — so don't throw that stuff away just yet!

WHO OWNS THE WIRES?

This is a question that is just now coming to the forefront as local apartment houses, condos, hospitals, etc. get the idea to put an earth terminal on their roof and go into competition with the cable operator who has been supplying them with service. What they want to do is compete with you using the wires that YOU installed in their building! Unfortunately, if you do not have a written contract stating that you reserve the ownership of those wires when you put them in, they may be able to do just that! It seems that this comes down to a real estate law question in each state. And each state seems to rule on it differently. In many cases, the case law that has been developed refers to telephone wiring, but the concept is the same. In any event, it would at the very least be wise, from now on, to make sure before you wire any large complex that you have a contract clearly stating that the wires remain yours — even if they are considered, at some later date, to have become a "fixture" of the building. That may mean you can't rip them out, but at least you will be able to control their use. Check your state laws.

IS A POST CARD PRIVATE?

Several operators have called the CATA office wondering whether their practice of sending out post card bills now violates the privacy provisions of S.66. While we do not know of any cases on point at the present time, our guessing (backed up with discussions with staffers on Capitol Hill) is that the answer is no. A post card, once put in the U.S. Mail, is considered private until delivered to the addressee. We don't think you have to change your billing practices because of S.66. On another point, we also don't think that an "electronic publication" of the privacy notice (say on a character generator channel) is sufficient under the law. Sorry about that. □

PART II

GROUNDED OUT

CAN YOU DIG IT?

BY:
Ralph A. Haimowitz
Director of Engineering
American Cablesystems of Florida

Achieving proper grounding for cable television systems seems to be one of the least understood areas in our industry, and frequently this is the source of numerous problems. Our primary concerns are to provide protection to our cable system and its equipment from direct lightning strokes which usually occur at the antenna tower at our headend, protection from induced lightning voltages where our cable plant is co-located with power and telephone cables, and to insure that we provide good grounds for communications circuits — particularly where we are using computers for digital information that is conveyed through our cable television system.

To begin to establish a good ground, we must consider that we are attempting to connect our cable shield, support strand, and equipment

housings through an electrical conductor (usually a solid copper, single conductor wire), to a metallic body (galvanized water pipe or copper ground rod) that is implanted in the earth. Our goal is to provide a low resistance current path from the cable system to ground, and we should be trying to achieve a total resistance to ground of 25 ohms or less. Be sure to check your local electrical codes for the maximum resistance to ground specifications as they may be lower than the "**average**" 25 ohms that are established under the National Electrical Code.

The resistance to current through an earth electrode has three factors that determine its effectiveness as a good grounding path. These are the actual resistance of the electrode and the connections to it, the contact resistance between the electrode and the earth that surrounds it, and the resistance of the surrounding earth.

Normally, the electrode or ground rod resistance should be minimal as they are designed and manufactured to be of sufficient size and materials to where their resistance is negligible when compared to the total resistance of the grounding circuit. The problems encountered in this factor of the resistance to ground measurement are through the use of incompatible bonding materials and improper connections. Since we have introduced the subject of bonding, this is probably the best time to explore this area in detail.

Bonding is an electrical term used to define the electrical connection of two or more conductors. Bonding is normally done by welding, brazing or soldering, or pressure bonding. Although welding or brazing/soldering are theoretically considered to provide the most reliable connections, they also create the most difficult methods of bonding that make them somewhat impractical. Trying to weld many materials can be very difficult and may destroy any protective plating which would lead to corrosion. Brazing or soldering to some metals is either very difficult or impossible to accomplish. Both of the above methods are extremely hard to accomplish in the field which creates a problem in changing out defective equipment and makes their methods somewhat impractical.

The pressure bond is the most commonly used connection method for electrical and electronic equipment. However, pressure bonding, such as by bolting or compression fittings, is highly susceptible to corrosion, particularly where dissimilar metals are used. Corrosion, of course, creates a high resistance bonded joint which results in failure of the grounded connection. One excellent advantage of a pressure bond using compatible metals is that the bonded joint tends to form a cold weld during a high current surge such as a lightning strike. A failed bond connection will create a fusion effect and separation of the bonded joint under the same electrical lightning strike conditions.

Many people have asked about using aluminum because it is very corrosion resistant. Aluminum conductors are the most unreliable metals for pressure bonding. However, aluminum makes a good, reliable joint when welded. Aluminum forms an aluminum oxide coating that causes this resistance to corrosion, but also causes problems with pressure bonding because it is an insulation material.

Copper is a low resistance conductor of current that can be easily soldered or pressure bonded. Copper's being a somewhat soft metal and quite expensive places some restrictions on its use as an electrode. Copper also has a lower fusion point than other metals which requires a much larger diametric size such as #6 AWG for the connecting ground wire where a high rate of current flow may occur to ground.

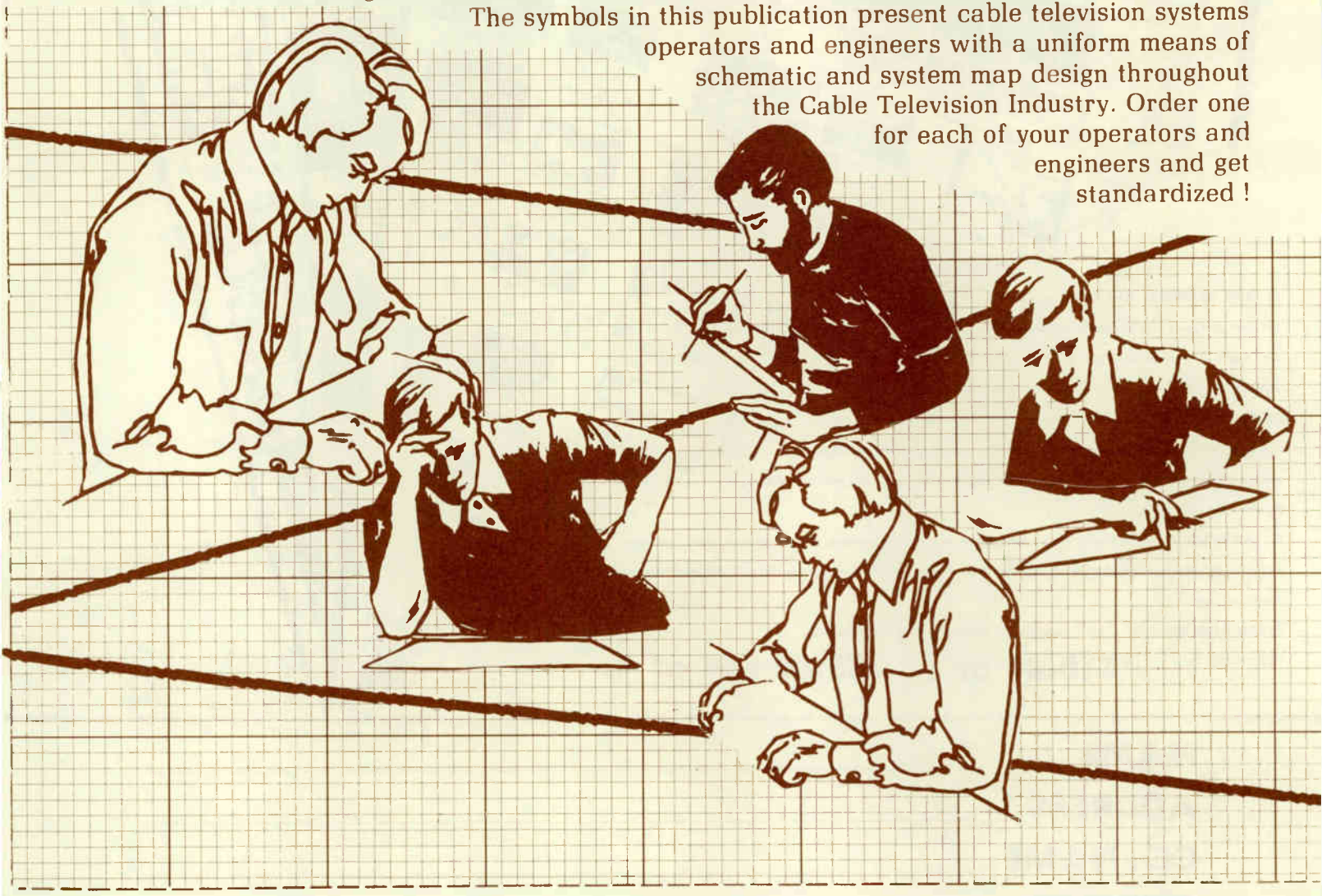
The keys to success in bonding are to use low resistance materials of the proper size, compatible metals at all joints, and well made, secure bonding joints. We will cover proper bonding specifics in greater detail later.

Returning to the resistance to current through an earth electrode, the second factor that can effect this level is the contact resistance between the electrode and the surrounding soil matter. As long as the electrode is kept clean of any insulating foreign matter such as paint or grease, and the surrounding earth is packed firmly around the electrode, the contact resistance is negligible. Even a coating of rust on an iron pipe has almost no effect upon the resistance level because iron oxide soaks up water and has less resistance than most soil matter.

STANDARDIZE

WITH THE NATIONAL STANDARDS FOR CATV SYSTEMS — GRAPHIC SYMBOLS

In order to help you standardize your grid and map preparation Television Publications is now offering a brochure of National Standards for CATV systems Graphic Symbols. The symbols in this publication present cable television systems operators and engineers with a uniform means of schematic and system map design throughout the Cable Television Industry. Order one for each of your operators and engineers and get standardized !



YES! I WANT THE NATIONAL STANDARDS FOR CATV SYSTEMS — GRAPHIC SYMBOLS GUIDE

SEND TO:

NAME _____ SYSTEM NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

PLEASE SEND _____ SYMBOLS GUIDES. ENCLOSED IS $_____ FOR MY ORDER.

PRICES
5.00 each
40.00 for 10 guides
90.00 for 25 guides

MAIL TO: TELEVISION PUBLICATIONS, INC. SUITE 106 4209 NW 23 OKLA. CITY OKLA. 73107 405/947-7664

FM VIDEO TRANSMISSION WALL CHART — This chart gives you a basic introduction to FM transmission, helping you to recognize particular distortions or set up problems, whether observed with a waveform monitor or a video monitor.

HEADEND/INTERFERENCE WALL CHART — has more than 20 off-the-screen photos of typical (and not so typical) off-air headend type problems. Each is identified, and with this chart you can zero in on headend problems in one big hurry. Explains what headend interefernce looks like and leads you to solutions to eliminate it.

FCC TESTS WALL CHART — is the industry's best training tool for teaching system employees how to recognize everything from cross-mod to HumMod. Has more than 60 off-the-screen photos of typical plant problems; things like Hum Mod (with calibration), signal to noise, co-channel and more.

CB INTERFERENCE WALL CHART — leads you quickly and painlessly to cures to CB interference.

COST FOR EACH IS: ☐ **$10.00 or** ☐ **$35.00 set of 4.**

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I am enclosing a check for $ _____ **for the items marked below.**

- ☐ **A — F.M. Video Transmission Chart**
- ☐ **B — CBIC — Citizens Band Interference Committee Diagnostic Chart**
- ☐ **C — FCC Compliance Tests Subjective Evaluation System Chart**
- ☐ **D — Head End Signal Quality Evaluation Comparison Chart**

Mail to: CATJ Magazine
Suite 106, 4209 N.W. 23rd
Okla. City, Okla. 73107

The resistance of the earth or soil material surrounding the electrode usually is the largest contributing factor in the resistance to current flow path. A ground rod driven into soil material with a fairly even consistancy of resistance will radiate the current in all directions in that earth from the electrode. To understand the effects of earth resistance, make a comparison between the ground rod driven into the earth and what happens when you drop a rock into a large pool of water. The rock displaces the water at the point it enters and creates a series of ripples that encircle the point of entry and flow outward in circular patterns of increasing diameter. The soil material closely surrounding an electrode, our first circular ripple in the point, has the highest amount of resistance because it has the smallest surface area. As we move outward, away from the electrode, the resistance decreases because the soil's surface area becomes larger and larger, until we reach a distance from the electrode where an increase in soil surface area no longer has any significant effect on the total resistive level.

SOIL TYPE	RESISTANCE OHMS/CM
Surface soils, loam	100 - 5,000
Clay	200 - 10,000
Sand and gravel	5,000 - 100,000
Limestone	500 - 400,000
Shale	500 - 10,000
Sandstone	2,000 - 200,000

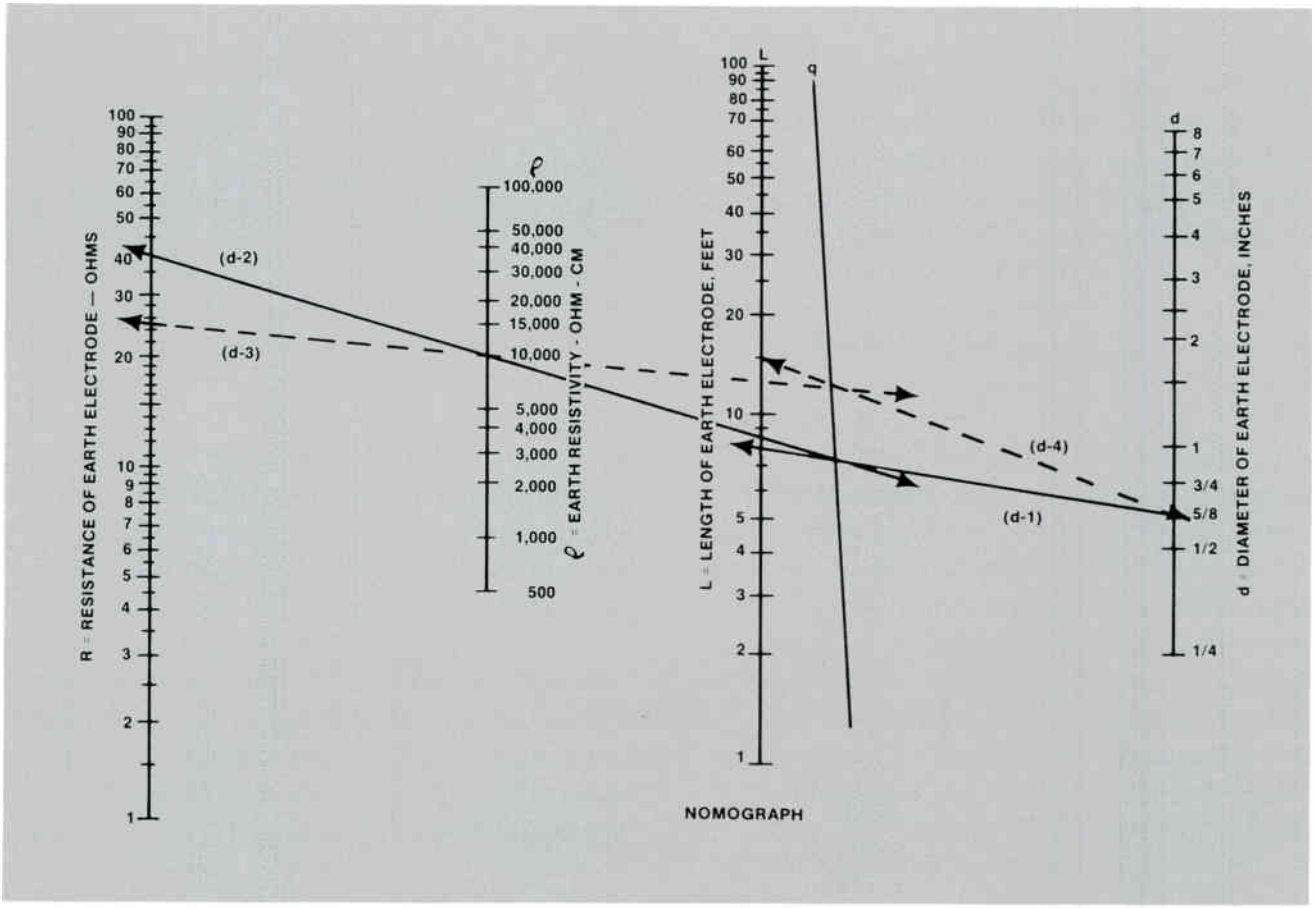
Because the conductive action in soil is mostly electrolytic, the amount of moisture and salt in the soil will affect its resistivity. The water content in soil will change with the weather, time of year, water draining or retention capabilities of the sub-soil, and the depth of the permanent water table. Let's compare two types of soil and changes in their moisture content. Both top soil and sandy loam that are perfectly dry would act as insulators, as their resistive values would be greater than one billion ohms/cm. Increasing the moisture content equally in each type of soil, in percentage by weight, has some dramatic results.

MOISTURE CONTENT	TOP SOIL OHMS/CM	SANDY LOAM
2.5%	250,000	150,000
5%	165,000	43,000
10%	53,000	22,000
15%	21,000	13,000
20%	12,000	10,000
30%	10,000	8,000

Earth resistivity is primarily based upon the soil material itself. Moisture and salt content of the soil, and temperature also affect the resistive value of soil resistance levels. Soil resistance is measured in ohm per centimeter (ohm/cm), and there can be a vast difference between a very sandy soil area and one that is mostly clay. Because it is almost impossible to define specifically a particular soil (clay can describe a very wide variety and mix of materials producing a clay-like substance), there are no specific resistive levels in ohm/cm for a given class or type of soil. Therefore, we can only provide a fairly wide ranging value of resistivity for the different soil classifications.

Salt content of surrounding soil, when dissolved in water, lowers the resistivity of the soil. The effect of salt content on resistivity in sandy loam shows that:

ADDED SALT % BY WEIGHT OF MOISTURE	RESISTIVITY OHMS/CM
0	10,700
0.1	1,800
1.0	460
5	190
10	130
20	100



In cases where a good earth resistivity ground is very difficult to obtain, the use of a salt additive to the surrounding soil area may prove to be more useful than an expensive and elaborate electrode system.

Temperature also affects the earth's resistivity. An increase in temperature will decrease the earth's resistivity, because water present in the soil mostly determines what resistivity levels are, and an increase in temperature significantly decreases the resistivity of water.

IN SANDY LOAM

TEMPERATURE/F	RESISTIVITY/OHM-CM
68°	7,200
50°	9,900
32° (water)	13,800
32° (ice)	30,000
23°	79,000
14°	330,000

Since moisture content and temperature of the soil become more stable as you go deeper into the earth, earth electrodes should reach a depth to give us a relative permanent moisture level and a constant temperature below frost line.

Let's examine practical methods to improve grounding conditions in your cable system. First, in accordance with the National Electrical Code (NEC), your ground "**rods should not be less than eight feet in length**" and "**non-ferrous rods, or their equivalent, shall be listed and will not be less than 1/2 inch in diameter.**" This fits the description of a U.L. listed copper bonded 5/8" x 8' ground rod.

Increasing the length of a ground rod will improve the earth-electrode resistance, while increasing the diametric size of the rod has a very small effect on its earth resistance. By adding another section to an 8' ground rod, you may be able to easily obtain 25 ohms or less to ground. Generally, doubling the length of a ground rod reduces resistance by about 40%.

The use of multiple ground rods, when added length does not achieve the required minimum resistance, can also be highly effective. Two well-spaced rods, driven into the soil, provide parallel paths to lower the circuit resistance. Two equal resistant rods of the same size and depth will reduce the circuit resistance by about 40%. When three rods are used, the reduction is 60%, and four rods 66%. Multiple rods must be spaced apart from each other at a distance longer than that of their depth in the soil. Increasing the spacing between rods may also prove to be helpful. For example, if you have two rods in parallel at 10 feet of spacing, the resistance is lowered by 40%. Spacing these same rods at 20 feet apart reduces the resistance by about 50%.

Finally, where all else fails, you should consider adding chemical treatments to the soil. Magnesium sulfate, copper sulfate, and common rock salt are suitable non-corrosive materials. Magnesium sulfate is the least corrosive, but rock salt is by far the cheapest and is effective when applied in a trench dug around the ground rod.

One simple means to help you determine how deep you must extend a ground rod to reach the nominal resistance of 25 ohms to ground is through the use of the Nomograph. If you measure the earth resistance of your ground rod system and the reading is above acceptable minimum requirements, say 40 ohms, with your Megger, and you are using a 5/8 inch ground rod driven 8 feet into the ground, draw a line (d-1) with your ruler from the 8 foot mark on the "L" graph to the 5/8 inch mark on the "d" graph to produce a reference point where this line crosses the "q" line. Draw a second line (d-2) from this reference point on the "q" line to the measured resistance (40 ohms) on the "R" graph.

Since the easiest variable to change to improve earth resistance is to increase the depth of your ground rod, we will use the Nomograph to determine approximately how deep we will need to go. Using the reference point of 10,000 ohms where line d-2 crossed the earth resistivity " " graph, draw a line (d-3) from the desired minimum resistance on the "R" graph (25 ohms) through the 10,000 ohm point on the " " graph until this line intersects the "q" line. Then connect a final line (d-4) from the 5/8 inch "d" graph through the (d-3) line reference point on the "q" line to the "L" graph. This point on the "L" graph then tells you that you must extend your ground rod to a depth of 15 feet.

After you have extended the rod to the indicated depth you must check again with your Megger to be sure that the desired minimum resistance has been met, as earth resistivity may not be the same at varying depths for which the Nomograph can not compensate.

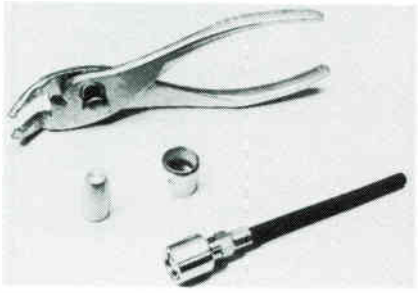
REFERENCES:

National Electrical Code

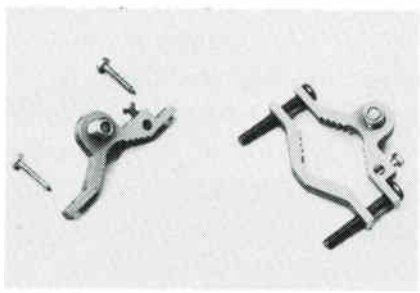
"Getting Down to Earth" - Biddle Instruments

□

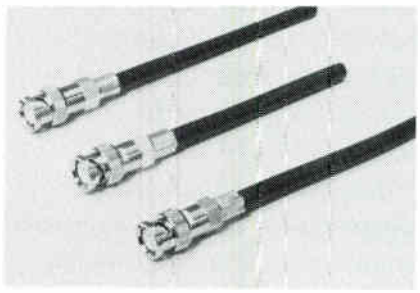
LRC ELECTRONICS



Security Shield



LRC Ground Block/Pipe Clamp



Crimp

NEW PRODUCTS OFFERED BY LRC ELECTRONICS

LRC Electronics has introduced an improved aluminum grounding block available with or without a pipe clamp attachment. This block is raised away from mounting surface to allow easy installation of "F" fittings. The pipe clamp permits attachment directly to any water pipe.

The grounding block is made of a die cast aluminum block with a machined brass cadmium-plated "F" connector.

When ordering the ground block, specify part number GB-81. To order the pipe clamp version, specify part number GB-81PC. Proper mounting hardware is included with each version. The pipe clamp is also available in a dual style block manufactured from zinc die cast. Specify part numbers DGB-81 and DGB-81PC. DGB-81 is priced at approximately 55¢.

LRC's new crimp on BNC connectors eliminates the need for costly adaptors. This one-piece connector has no loose parts and attaches directly to the coax by crimping. Standard hex crimping tools are required as used on the most common "F" style connectors.

For use in headends, with test equipment, in LAN's, or anywhere BNC connectors are used. Available for most RG59 , RG6 and RG62 cables. In quantity, these connectors are priced under **$3.50** each.

LRC has introduced a BNC security shield for use with their line of crimp on BNC connectors. This security shield may be used on all manufacturer's male BNC connectors. It eliminates tampering and unauthorized changing of connectors anywhere BNC's are used. With its unique design, once installed it remains on the connector permanently, resulting in a one-time investment.

Installation and removal tools are easy to use and allow removal of the BNC from the mating connector; however, the shield stays on the BNC male.

Priced under $1.00 in quantity, the BNC security shield will save you money.

LRC Electronics, a subsidiary of Augat, Inc., is located at 901 South Avenue, Horseheads, New York 14845. Telephone (607) 739-3844.

Augat, Inc. designs and manufactures a broad range of electromechanical components for the electronics industry, and is a major supplier of related services. The company's principal products and services are integrated circuit sockets and accessories, coaxial cable network and fiberoptic interconnection products, subminiature switches, high reliability packages for microcircuits, packaging panels, computer aided design and wiring services, interconnection test probes and systems, and custom connector assemblies for the automotive and telecommunications industries. ►

AVTEK, INC. CHANGES ITS NAME TO RISER-BOND

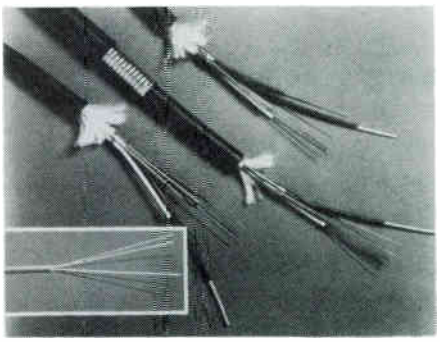
Marshall B. Borchert, President of AVTEK, Inc. has announced that the Nebraska based electronic test equipment firm will change its name effective May 2, 1985.

The new name, RISER-BOND, will be the only major change within the corporate structure. All other aspects of the business will remain the same.

RISER-BOND Instruments manufactures a simplified time domain reflectometer and will continue to develop other similar products.

Borchert stated that RISER-BOND Instruments will remain dedicated to bringing "High Tech Simplicity" and cost effective test equipment to the cable industry. Customers can contact them at 1109 K Street, P.O. Box 188, Aurora, Nebraska 68818; tele phone (402) 694-5201.

GENERAL CABLE INTRODUCES MultiPak™, HIGH COUNT FIBER OPTIC CABLES



Multipak™ High Fiber Optic Cables

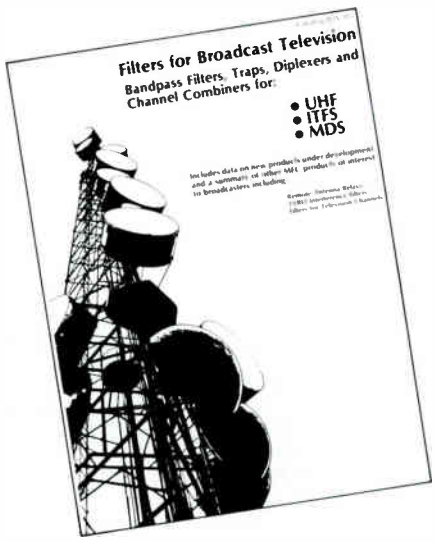
General Cable Company's Fiber Optics Division has introduced "MultiPak™," a new line of optical fiber cables. The MultiPak design provides high fiber count cables having 14 to 108 fibers and consisting of either multiple single-mode or multimode optical fibers in loose buffered tubes. Among other applications, these high capacity cables are eminently suitable for termination in a central office environment. MultiPak cables are available in a number of constructions, with a dielectric or steel central strength member, and either a non-metallic jacket or steel armor sheath.

Data sheets on General Cable Company's MultiPak series fiber optic cable are available from: Marketing Coordinator, General Cable Company, Fiber Optics Division, 160 Fieldcrest Avenue, Edison, New Jersey, 08818.

NEW BROADCAST TELEVISION CATALOG BTV/85 AVAILABLE FROM MICROWAVE FILTER

A new and expanded line of broadcast filters for ITFS, MDS and UHF is described in catalog BTV/85. It also mentions several products still under development for which customers have expressed interest.

Featured are ITFS products as channel combiners and bandpass filters for combining or separating several individual channels or groups of channels. Introduced is the ITFS/MDS coupler which combines the MDS band to existing ITFS systems, along with filters for a variety of MDS and UHF applications.



Television relay bandpass filters for electronic news gathering and diplexers for combining or separating two frequency bands are summarized.

Mention is also made of other MFC products for suppressing terrestrial interference at satellite earth station antennas, and filters and traps for cable television. Inline coaxial relays for remotely switching two to nine antennas with a single coaxial cable to the radio are also described.

For a free copy of the catalog, contact Emily Bostick at Microwave Filter Company, Inc., 6743 Kinne St., East Syracuse, N.Y. 13057. Call 1-800-448-1666 or (315) 437-3953 for NY/AK/HI/ Canada residents.

A.s.s.o.c.i.a.t.e R.o.s.t.e.r

Note: Associates listed with * are Charter Members.

Jim Ackerman & Associates, Inc.,
1800 N. Meridian St. #410
Indianapolis, IN 46202
317—923-2353
(S9, Brokerage House)

Alpha Technologies
1305 Fraser St. D-G,
Bellingham, WA 98225
206—671-7703
(M9, Standby Power Supplies)

AMCOM, Inc.,
Bldg. E, Suite 200,
5775 Peachtree-Dunwoody Rd., N.E.,
Atlanta, GA 30342
404—256-0228
(S9, Brokering & Consulting)

* **Anixter Communications,**
4711 Golf Road,
Skokie, IL 60076
312—677-2600
(D1)

Arts & Entertainment Network
555 Fifth Avenue
New York, NY 10017
212—661-4500
(S9)

Av-Tek, Inc., Inc.,
Box 188,
Aurora, NE 68818
402—694-5201
(M8)

Blonder-Tongue Labs, Inc.,
1 Jake Brown Rd.,
Old Bridge, NJ 08857
201—697-4000
(M1, 2, 4, 5)

Broadband Engineering, Inc.
P.O. Box 1247,
Jupiter, FL 33458
1-800—327-6690
(D9, M4, S9)

Budco, Inc.,
4910 East Admiral Place,
Tulsa, OK 74115
1-800—331-2246
(D9, Security & Identification Devices)

Cable Constructors, Inc.,
Iron Mountain, MI 49801

CATEL,
4800 Patrick Henry Dr.,
Santa Clara, CA 95054
408—988-7722

Capscan, Inc.
P.O. Box 36,
Adelphia, NJ 07710
1-800—CABLETV or 222-5388
(M1, 3, 4, 5)

CBN Cable Network,
CBN Center
Virginia Beach, VA 23463
804—424-7777
(S9)

* **C-Cor Electronics, Inc.,**
60 Decibel Rd.,
State College, PA 16801
814—238-2461
(M1, 4, 5, S1, 2, 8)

CWY Electronics
405 N. Earl Ave.,
Lafayette, IN 74904
1-800—428-7596
(M9, D1)

Cable Graphic Sciences
7095 N. Clovis Ave.
Clovis, CA 93612
209—297-0508
(M9 Character Generators)

Communications Equity Associates,
851 Lincoln Center,
5401 W. Kennedy Blvd.,
Tampa, FL 33609
813—877-8844
(S3)

ComSonics, Inc.,
P.O. Box 1106,
Harrisonburg, VA 22801
1-800—336-9681
(M8, 9, S8, 9)

The Disney Channel
500 S. Buena Vista
Burbank, CA 91521
213—840-5080
(S4)

Ditch Witch,
P.O. Box 66,
Perry, OK 73077
1-800—654-6481
(M9)

The Drop Shop Ltd., Inc.,
Box 284,
Roselle, NJ 07203
1-800—526-4100 or
1-800—227-0700 (West)
(D3, 4, 5, 6, 7, 8, 9, M5, 6, 7, 8, 9 Plastics)

Durnell Engineering Inc.,
Hwy 4 So.
Emmetsburg, IA 50536
712—852-2611
(M9)

Eagle Com-Tronics, Inc.,
4562 Waterhouse Rd.,
Clay, NY 13041
1-800—448-7474
(M9, Pay TV Delivery Systems & Products)

Eastern Microwave, Inc.,
3 Northern Concourse,
P.O. Box 4872,
Syracuse, NY 13221
315—455-5955
(S4)

Electroline TV Equipment, Inc.,
8750-8th Ave.,
St. Michel,
Montreal, Canada
H1Z 2W4
514—725-2471
(M4, 5, 7, 9, D7, 9)

Electron Consulting Associates,
Box 2029,
Grove, OK 74344
918—786-5349
(M2, D1, S1, 8)

ESPN,
ESPN Plaza,
Bristol, CT 06010
203—584-8477
(S9)

Group W Satellite Communications
41 Harbor Plaza Dr.,
P.O. Box 10210,
Stamford, CT 06904
203—965-6219
(S4)

Harmon & Company
5660 S. Syracuse Circle
Greenwood Plaza,
Englewood, CO 80111
303—773-3821
(S3)

Heller-Oak Communications
105 W. Adams St.,
Chicago, IL 60603
1-800—621-2139 * 7600
(S3)

Home Box Office, Inc.,
12750 Merit Dr.
Dallas, TX 75251
214—387-8557
(S4)

Ind. Co. Cable TV, Inc.,
P.O. Box 3799
Hwy. 167 N,
Batesville, AR 72501
501—793-4174
(D1)

* **Jerry Conn Associates, Inc.,**
P.O. Box 444,
Chambersburg, PA 17201
1-800—233-7600
1-800—692-7370 (PA)
(D3, 4, 5, 6, 7, 8)

KMP Computer Services, Inc.,
135 Longview Dr.,
Los Alamos, NM 87544
505—662-5545
(S4, 5)

Katek, Inc.,
215 Wood Ave.,
Middlesex, NJ 08846
201—356-8940

Klungness Electronic Supply,
P.O. Box 547,
107 Kent Street,
Iron Mountain, MI 49801
1-800—338-9292
1-800—682-7140 (Mich)
(D1, 8, S2, 8)

LRC Electronics, Inc.,
901 South Ave.,
Horseheads, NY 14845
607—739-3844
(M7)

Larson Electronics, Inc.,
311 S. Locust St.,
Denton, TX 76201
817—387-0002
(M9 Standby Power)

Lifetime
1211 Avenue of the Americas
4th Floor
New York, NY 10036
212—719-7230
(S9, Programming)

Lindsay America, Inc.
P.O. Box 15775
1202 B West 19th St.
Panama City, FL 32405
904—769-2321

Long & Aldridge
1900 Rhodes Haverty Bldg.
134 Peachtree St.
Atlanta, GA 30043
404—681-3000
(S9, Law)

MA/COM Cable Home Group
P.O. Box 1729
Hickory, NC 28603
1-800—438-3331
(M2, 3, 7, S2)

Magnavox CATV Systems, Inc.
100 Fairgrounds Dr.,
Manlius, NY 13104
315—682-9105
(M2, 3, 7, S2)

Meyer, Capel, Hirschfeld Law Office
306 W. Church St.
P.O. Box 577
Champaign, IL 61820
217—352-7941
(S9, Law)

* **Microwave Filter Co.,**
6743 Kinne St., Box 103,
E. Syracuse, NY 10357
1-800—448-1666
(M9 Bandpass Filter)

Oak Communications, Inc.
16516 Via Esprillo
Rancho Bernardo, CA 92127
619—451-1500

Panasonic Industrial, Co.,
One Panasonic Way
Secaucus, NJ 07094
201—392-4109

Power and Telephone Supply Company, Inc.
530 Interchange Drive N.W.,
Atlanta, GA 30336
1-800—241-9996
(D1)

Quality RF Services, Inc.
825 Park Way, Suite 3,
Jupiter, FL 33458
305—747-4998
1-800—327-9767
1-800—433-0107 (In Florida)
(M4, S9)

Regency Cable Products,
P.O. Box 379
Bernhards Bay, NY 13028

RMS Electronics
50 Antin Place
Bronx, NY 10462
1-800—223-8312
1-800—221-8857 (Poleline)
(M4, 5, 6, 7, 9)

Sadelco, Inc.,
75 West Forest Ave.,
Englewood, NJ 07631
201—569-3323
(M8)

Satellite Syndicated Systems, Inc.,
P.O. Box 470684
Tulsa, OK 74147
918—481-0881
(S9)

Scientific Atlanta,
P.O. Box 105600
Atlanta, GA 30348
404—441-4000

Showtime/The Movie Channel, Inc.
1633 Broadway,
New York, NY 10019
212—708-1600
(S4)

Studioline Cable Stereo
11490 Commerce Park Dr.
Reston, VA 22091
703—648-3200
(S9, Audio Program)

Telstar Marketing & Consulting
C.T.H."F" 2930
Blue Mounds, WI 53517
608—437-5460
(S9)

Tele-Wire Supply Corp.,
7 Michael Ave.,
East Farmingdale,
NY 11735
516—293-7788
(D1, 2, 3, 5, 6, 7, 8, 9)

* **Texscan Corp.,**
3102 N. 29th Ave.,
Phoenix, AZ 85017
602—252-5021
(M4, M5, M8, M9)

* **Times Fiber Communications,**
358 Hall Avenue,
Wallingford, CT 06492
1-800—243-6904
(M3)

Tocom, Inc.,
P.O. Box 47066,
Dallas, TX 75247
214—438-7691
(M1, 4, 9 Converters)

* **Toner Cable Equipment, Inc.,**
969 Horsham Rd.,
Horsham, PA 19044
1-800—523-5947
In PA 1-800—523-492-2512
also 1-800—523-5947 (PA)
(D2, 3, 4, 5, 6, 7)

Triple Crown Electronics, Inc.,
4560 Fieldgate Dr.,
Mississauga, Ontario,
Canada L4W 3W6
416—629-1111
Telex 06-960-456
(M4, 8)

Turner Broadcasting System,
1050 Techwood Dr.,
Atlanta, GA 30318
404—898-8500

TV Watch, Inc.,
1819 Peachtree Rd. N.E.
Atlanta, GA 30309
1-800—554-1155
(S9)

United Press International
220 East 42nd St.,
New York, NY 10017
212—682-0400
(S9 Automated News SVC)

United Video, Inc.,
3801 South Sheridan Rd.,
Tulsa, OK 74145
1-800—331-4806
(S9)

USA Network
303 East Ohio Street
Time & Life Bldg. Suite 2701
Chicago, IL 60611
312—644-5413
(S9)

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Unit 53,
Scarborough, Ontario,
Canada M1H 2X1
416—439-3170
(M9 Cable Converter)

Vitek Electronics
710 Narragansett Park Dr.
Pawtucket, RI 02861
401—724-4400

Walsh, Walsh, Sweeney & Whitney, S.C.
P.O. Box 1269,
Madison, WI 53701
608—257-1491
(S9)

* **Wavetek Indiana**
5808 Churchman,
Beech Grove, IN 46107
1-800—428-4424
TWIX 810—341-3226
(M8)

Weatherscan,
Loop 132,
Throckmorton Hwy.,
Olney, TX 76374
817—564-5688
(D9, Sony Equip. Dist., M9 Weather Channel Displays)

Western Towers
Box 2040
San Angelo, TX 76902
915—658-6539/653-5291
(M2, 9 Towers)

Zenith Radio Corp.,
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Prescription medicines can be hazardous to your health — if they are outdated or used for ailments other than the doctor intended. These and other warnings on prescription medicine safety are featured in new TV and radio public service messages from the National Safety Council.

The TV messages consist of three 30-second spots which discuss expired prescriptions and warn against taking someone else's medicine. The same information is handled in 15-, 20- and 30-second radio messages. Audiences are cautioned that unused prescription medicines may change in effectiveness over time and some can become harmful. And, cluttered medicine cabinets or prescription containers without labels can lead to dangerous mistakes. Any old or unlabeled medicines should be dumped and the empty containers rinsed out and discarded, the Council advises.

A related warning is to remember that all prescriptions are personal and that it is dangerous to take medicine that was meant for another person.

The spots were funded through a grant from Eli Lilly and Company, a manufacturer and marketer of human health products, headquartered at Indianapolis, Ind. A Lilly spokesman said its assistance to the Council in getting out the public service messages is part of an on-going program to alert individuals about potential hazards of drug abuse or misuse in any form.

Both the TV and radio campaigns were produced by Planned Communications Services, Inc., of New York.

The National Safety Council, headquartered at Chicago, is a not-for-profit, non-governmental public service organization of private citizens, corporations and associations working in the private sector to increase the safety and improve the health of the American people.

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