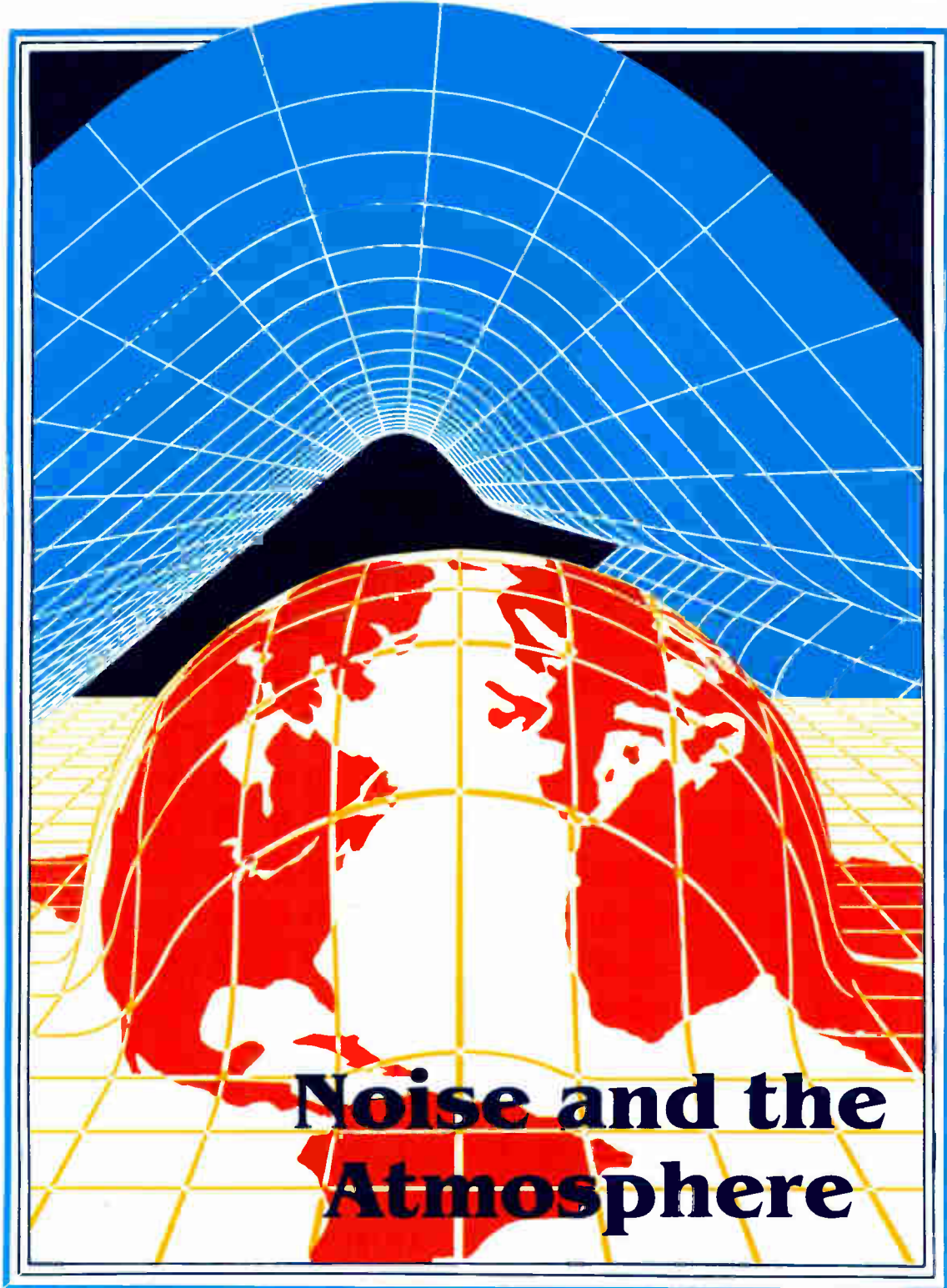


CATJ

OFFICIAL JOURNAL OF THE COMMUNITY ANTENNA TELEVISION ASSOCIATION

APRIL 1985



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Developing a close bond requires understanding and cooperation. Understanding your needs and cooperating to develop effective solutions is our idea of Customer Service.

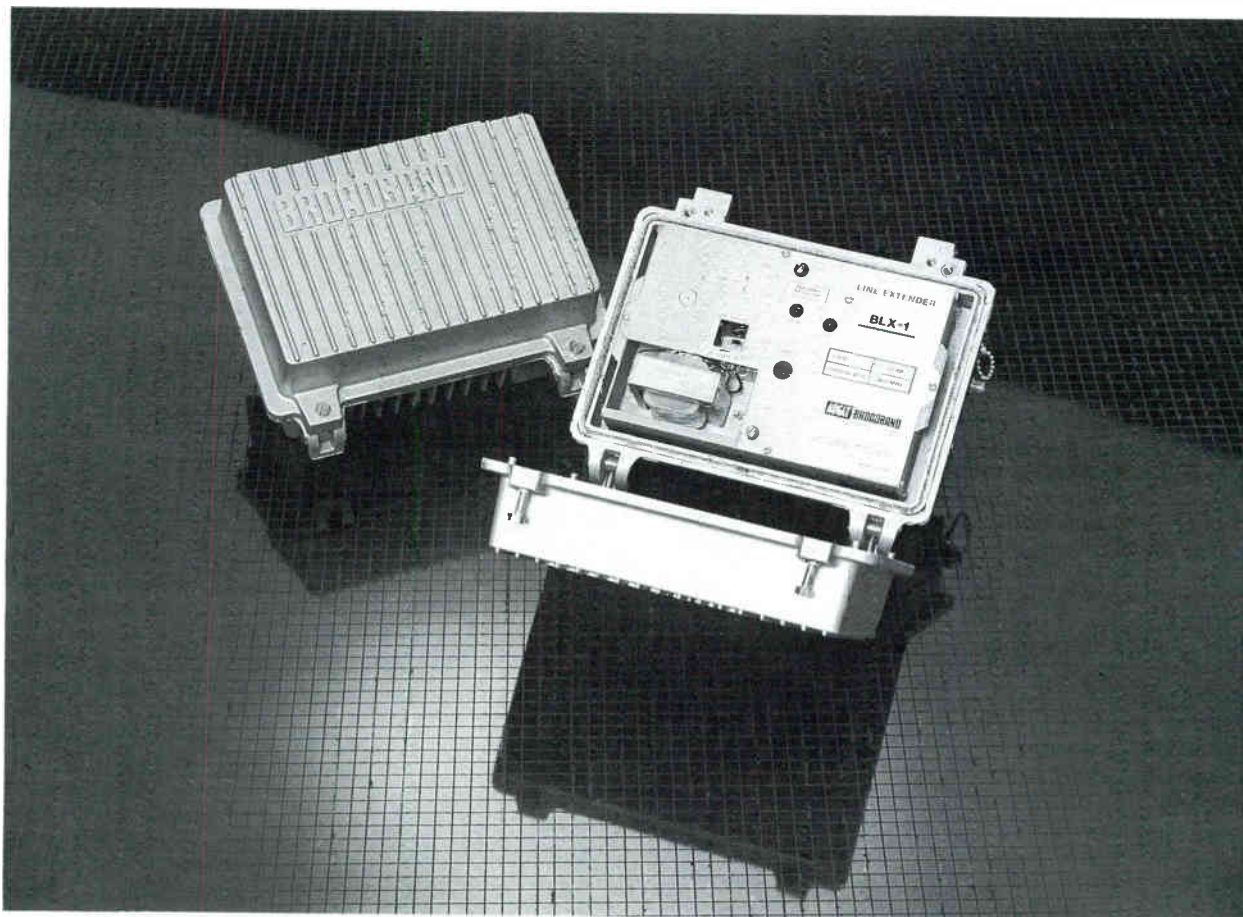
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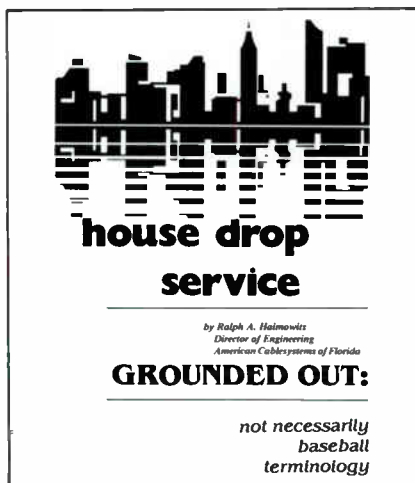
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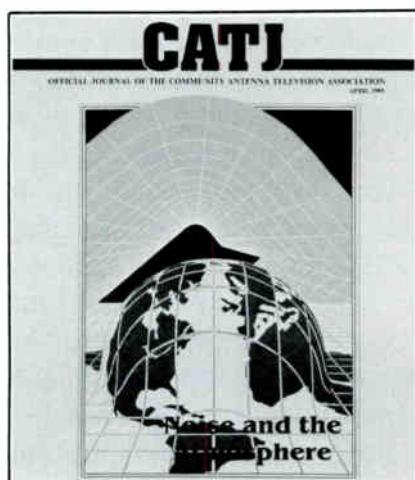
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ABOUT THE COVER

The cover highlights the two-part presentation on Noise Temperature and the elements which contribute to the Noise Temperature of a Communications Receiving System.



Carl Schmauder
PRESIDENT OF CATA

WIN/WIN

Throughout the long and arduous process of developing an industry consensus regarding cable legislation, one of the key points of contention was whether the industry should rely on the Courts, the FCC, or Congress. Some argued that cable was being hampered by city violations of the antitrust laws and that these laws should be the focus of our efforts. Others, including CATA, have maintained for a very long time that the First Amendment rights of cable operators are being abridged not only by what the cities have been doing in the franchising process, but also by the actions of the FCC, particularly relating to the “must carry” rules.

Another strong voice was heard for the proposition that the only way cable was ever ultimately going to get out of the mess we found ourselves in was to resort to the political process embodied in congressional legislation. The FCC also made its view known, both formally and informally, suggesting that the industry would be better off leaving the political landscape the way it was, that the Commission, after many years of study, now understood our problems and was sympathetic to our plight — that they would take care of us.

As is usually the case when a debate of this nature takes place, everyone was right to some degree. Certainly the Commission was becoming more effective in preventing the abuses that were the main complaint of cable operators nationwide. The “Nevada” and “Miami” decisions are testaments to that fact. But it is also fair to say that, as with any Federal agency, what the Commission “giveth”, the Commission could equally “taketh away”! We presently have a Commission that is sympathetic —

but nothing says that Nick Johnson (or someone like him) will never be renamed to that body!

As far as relying on the political process goes, well, we knew from the start that we would not get everything we wanted — that ultimately there would be compromises. That is the nature of the game. So long as the industry could stop a bill that was devastating from our point of view, it made sense to proceed with the process and see where we came out. As it turned out, there were times when it appeared that having the bill would be worse than not having it. And during those times, CATA, for one, was ready to work to make sure the bill did not pass. But adjustments were made, and the bill in its final form was considered better for cable operators than the lack of a bill. On that basis we supported it, even though there were some things in the bill we thought were wrong. From the very start, CATA pointed out that the mere fact something gets put into the bill does not necessarily mean it is constitutional. We always maintained that one way or another the question of cable’s First Amendment rights would ultimately have to be decided by the Courts.

That has now happened. In a case that has just been decided by the Court of Appeals for the 9th Circuit, cable has been recognized as having substantial First Amendment rights, and the power of the cities to abridge those rights has been put into serious question. The case, Preferred Communications, Inc. vs. The City of Los Angeles, is far from over. It has been remanded to the lower court, as explained in this issue’s Washington Update. But the broad outlines of what the Court said are what I want to dwell on here.

The Court said that cable is a First Amendment speaker, that restricting franchises are an abridgement of First Amendment rights, and that regulation of cable may take place so long as the cable operator’s rights are always protected. What is this all going to mean? I suggest you read the analysis in the Washington Update for a better understanding. From a “first blush” look, however, I would have to say that the cable industry gained a substantial victory. The Court even suggests in a footnote that any provision of the new cable law purporting to allow cities to grant an exclusive franchise when there is additional pole space available for other cable

operators would be invalid.

Did we thus make a mistake supporting S. 66? Not at all. We have accomplished a “win/win”. We have won our points in Congress, to the degree they could be won, and then we have succeeded in Court in pointing out that our rights extend even further! Not a bad result. Of course there are always dangers in sweeping decisions such as this one. There is a seeming invitation for “overbuilding”, for instance. But is that truly all bad? I don’t think so. If an operator has truly been giving good service to his or her community, then the danger of overbuild is slight since the subscribers will be satisfied with the existing operator. On the other hand, if the existing operator has not been a good citizen of the community and provided a valuable service, then the citizens deserve a replacement, or at least the improvement of services automatically brought on by healthy competition. The marketplace, in those instances, is operating as it should — without the interference of government.

This is as it should be. The combination of the Court’s decision and the many valuable codifications

contained in the new cable bill are creating a new framework in which cable operators may operate free of the whims of local regulators. The FCC will also continue to have a major role to play as it becomes ever more deeply involved in the job Congress has given it of interpreting the new Act in the first instance. All of these factors reinforce my view that the cable industry should be very proud of the process and path it has taken. Our debates, disagreements, coalitions, considerations, and plain old hard work seeking a sensible consensus on where we should go and what we should do has resulted in significant gains for all of us. That process is now starting, once again, in the area of Copyright. I expect that before we are through we will once again have to go the arduous and sometimes painful route of forging a consensus in the furnace of open debate. It is a healthy procedure for the industry, however, it is a far better one than the alternatives of either no agreement at all, or one reached through private “back room” dealing. Let’s all remember that as the debate heats up, and once again seek a “win/win” resolution to our differences. □

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PROGRAMMING NOTES:

THE WEATHER CHANNEL

THE WEATHER CHANNEL local avails and crawl capability offer many revenue generating opportunities to affiliate cable systems through advertising sales as well as system and cross promotions.

Last year, THE WEATHER CHANNEL developed THE STARLIT™ to help affiliates take full advantage of local avails on the network.

Now, THE WEATHER CHANNEL introduces a new system which will aid affiliates in easier utilization of the crawl function for advertising and promotions. The Remote Keyboard Adapter works with THE WEATHER STAR® to enable affiliate systems to input crawl messages from locations other than the headend. Previously, the messages had to be keyed in at the system headend where THE WEATHER STAR is located. With the Remote Keyboard Adapter, messages can be input from the affiliate office or another convenient location.

This new system also permits up to 10 full crawl messages to be stored in advance. Through this function, affiliates can enter crawl messages and a rotation schedule. Rotation of crawl messages can be scheduled in intervals as short as every 15 minutes up to as long as once every 24 hours, allowing flexibility for advertising or promotion schedules. The Remote Keyboard Adapter automatically recovers following a power failure. The rechargeable, internal battery keeps its clock running so that it can move to the proper place in the set schedule. This crawl message storage and scheduling function is also available without the remote capability.

The system is easy to install and use. It is based on the Radio Shack Model 100 Computer, which is modified by THE WEATHER CHANNEL with an interface box and computer program developed by the network's New Technologies staff.

At the headend, the computer is connected through the interface box to THE WEATHER STAR and also to a designated telephone line. This line can still be used for any normal outgoing calls, but the Remote Keyboard Adapter automatically answers all incoming calls. A second Radio Shack Model 100 computer is located at the affiliate office or other location and is used to communicate by telephone with the computer unit at the headend.

THE WEATHER CHANNEL provides millions of viewers across the country with local, regional, national, and international weather information on demand, 24 hours a day, every day.

HOME THEATER NETWORK

Home Theater Network is cooperating on efforts to locate missing children by using a weekly live call-in to cablecast information and pictures of missing children. HTN provides the toll-free number for The Child Find Inc., an international network for locating missing young people. Thus far, the response from HTN's subscribers has been strong, indicating an awareness and interest of the public in this agonizing situation for parents and families of these missing children.

THE DISNEY CHANNEL

The Disney Channel has produced two new animated

series which will introduce new Disney characters; one, produced for CBS, features "The Wuzzles" who are characters that possess the traits of two animals. The other series for NBC is called "The Gummi Bears", an adventure-comedy story about a mythical race of bears that fight evil with a young boy. Both of these series will be presented on Saturday mornings, the time for which has not yet been set. Also planned by Disney are some made-for-TV movies for network use on Sunday nights and some seasonal specials. Disney also plans to enter in an agreement to air some Disney films with pay-cable programmers.

THE MOVIE CHANNEL

THE MOVIE CHANNEL has inaugurated a new consumer advertising campaign, called "THE HEART OF HOLLYWOOD", running in the form of 30 and 60 second spots on nationwide basic cable networks, as well as multipay guides, in an effort to position TMC as the only pay service completely devoted to movies and Hollywood, as it presents Hollywood nonstop 24 hours a day: the movies, the people, the stories. The theme line defines the service and sets it apart from other pay services, stressing in-depth, timely coverage of the film-making community, as well as the 24-hour-a-day movie schedule, which includes the best new and classic Hollywood movies.

This campaign theme will get TMC's message to affiliates, current subscribers, basic subscribers, and people who thus far have not been willing to try cable television, thus making it a plus for cable operators as well to assist them with potential subscribers. □

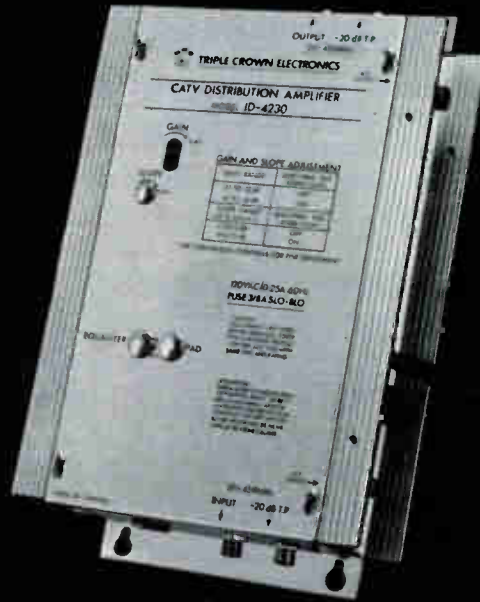
(continued on page 16)

HOW ABOUT SOME INSIDE INFORMATION?

This ID4230 amplifier is just one of the 450 MHz ID4000 series. With our other products in the ID-Indoor Distribution group they can cover every inside requirement. As for out of doors, the DL series of Line and Distribution amplifiers meets most needs.

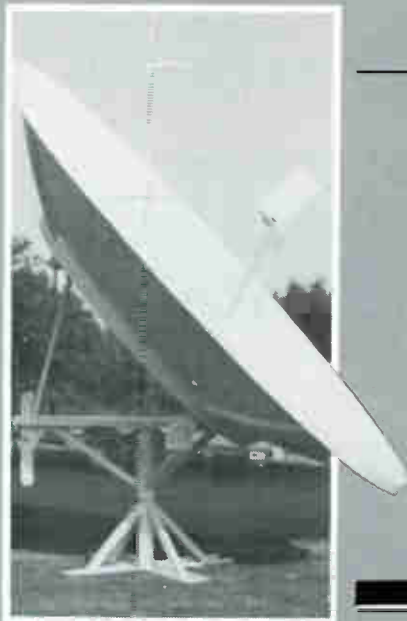
But for the real inside information, Triple Crown now offers all DBC products, broadcasting, addressable, and of course CATV amplifiers. The addition of DBC Unicom, Celecom and DA series gives Triple Crown an amplifier for every situation.

Another bit of inside info ... behind this ID4230 is something which cannot be seen—Experience! The experience of years of innovative engineering and thousands of satisfied customers. You may not be able to see it, but you can depend on it.



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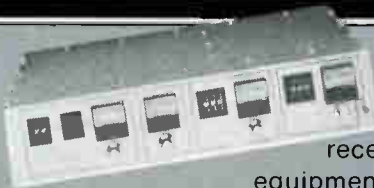
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DBS Is Worth Saving

Direct broadcast satellite. DBS. Is it about to go the way of the Edsel?

Business Week reports that even the most sanguine supporters of DBS concede it will never replace cable or network broadcasting. Worse still, will it have any market? Though the dishes are down to \$400, which does mean a potential DBS market, the cost for those operators hoping to enter the field is up to \$150 million.

Experts agree that unless HBO jumps in, or some other big player, the 20 million homes that cable will never reach will have to settle

for the poor-quality transmission of broadcast TV they presently receive.

Meanwhile, all the giants that were supposed to pour dollars into DBS — CBS, RCA, Western Union — have folded their tents.

We realize that DBS might represent engineering overkill; that a technology, no matter how prepossessing, must fill a need in order to have life. Nonetheless, we will be sorry to see DBS fade away. Anything that improves communications gets our vote.

Those homes in small and rural America — some 25 percent of the 80 million TV households — deserve a choice; they deserve better than just the networks. Conversely, satellite communications, the thing that made HBO

and the other national cable networks and which someday will encompass mobile phones, has far too much potential to have the DBS blot on its escutcheon.

We still believe in television as library. Television as a network monopoly is too few books to read; an imbalanced perspective. It used to be that cable seemed about to fill up the book shelves of the TV library. Obviously, this is not going to happen. More is needed. That could very well be DBS. We hope some entrepreneurs will figure out the key. Surely with a potential market of 20 million homes good old Yankee ingenuity can win out.

Reprinted with permission from *Media People*, February 1985. □

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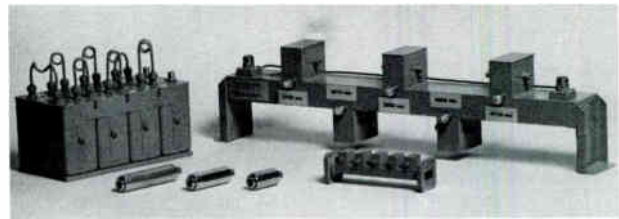
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When using this log for recording signal leakage in the Aeronautical Frequency Bands, the log sheet must remain in the file for a minimum of two years.

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CATA '85

Opryland

June 17 - 19

The 1985 CATA Annual Meeting and Exposition is scheduled for June 17-19 at the Opryland Hotel in Nashville, and it will be a time for America's cable television operators and their families to gather and continue the tradition of friendship and solid informational sessions presented in family-oriented facilities with entertainment, recreation and historic American culture.

CATA '85 programs will cover a wide-range of topics, including **Building a Small Town Cable System-Tips for Success; Low Cost Alternative to Feed Forward, Signal Leakage and Aeronautical Frequency Rules, Ensuring Reliability in House Drops, Controlling Programming Costs** (exploring cooperative buying and reviewing contracts), **Making Ad Dollars Work For You, What's Ahead on Copyright and Must Carry Rules, Answering Questions on S.66, Franchise Fees** (and what you need to know about them), **Addressability/Pay Per View** (what's in it for you?), **Scrambling** (its technical implications), and more on training, sales campaigns and

keeping subscribers happy and coming back for more.

Along with the business and technical sessions, CATA '85 will feature **Jack Daniels' Day** on Sunday, June 16, when convention-goers and their families will spend the day at this famous American landmark distillery and visit a Tennessee Walking Horse Farm. Monday evening, June 17, CATA will host an Old South Party at an authentic ante-bellum mansion outside Nashville complete with hoop-skirted Belles and dashing Southern Gentlemen, cool breezes and Magnolia blossoms, Hurricane lanterns and musicians. The final social gathering for CATA '85 will be a luncheon on Wednesday, featuring a special speaker of interest.

by **Judith Baer**
Baer Enterprises, Inc.

CATA '85 Spouse/Family Programs have been designed for anyone over the age of 12 with an interest in relaxation, self-improvement, shopping, and history. Two full-day programs are featured with additional special events on Wednesday morning, June 19. A special CATA '85 Lounge will be available for informal gatherings, and a "Departure Lounge" will be open on the last day of the meeting so that check-out will be quick and easy. The "Departure Lounge" will feature instruction on black-jack and various other "arts," to prepare for the 1986 annual meeting in Reno.

CATAKids between the ages of six and 12 will join their families for Sunday's tour and dinner on Monday night, if they're still awake after a full-day of professionally escorted children's programs, including a day at **Opryland**, with its rides, shows and attractions. On Tuesday, CATAKids will be chaperoned on a visit to the Alabama Space and Rocket Center in Huntsville, where they'll visit the world's largest space museum and experience the "hands-on" exhibits for

Join CATA'S Traditions

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.
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Broadband Engineering, Inc.
Burnup & Sims Cable Products Group
C-Cor Electronics
Cablefacts
Catel Telecommunications
CBN Cable Network
Channell Commercial Corporation
ComSonics, Inc.
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The Disney Channel
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Home Box Office, Inc.
Ind. Co. Cable TV, Inc.
Larson Electronics

Lifetime
Lindsay America
M/A-Com Cable Home Group
Magnavox CATV Systems, Inc.
MTV Networks, Inc.
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Quality RF Services, Inc.
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Scientific-Atlanta, Inc.
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Studioline
Texscan Corporation
Times Fiber Communications, Inc.
Triple Crown Electronics, Inc.
Turner Broadcasting System
United Video, Inc.
USA Cable Network
Wavetek Indiana, Inc.
Western Towers
Zenith Electronics Corporation

tomorrow's space travelers. Next door they'll tour the laboratories and test areas of the Marshall Space Flight Center. On Wednesday morning, CATA has arranged for crafts programs and entertainment to keep the children busy until parents return from the CATA '85 luncheon, which is the

concluding convention event.

As in the past, CATA '85 will feature the popular **Consultant's Corner and Demonstration Area** in the Exhibit Hall. Light food and beverages will also be available in the exhibit area, and there are no conflicting programs going on when it's time to visit CATA '85 Exhibitors. There

will be approximately 60 firms displaying their wares and services at CATA '85, and many exhibitors will continue the tradition of bringing their own families to this popular industry annual event.

Registration materials were released March 1. Fees for CATA **Member Systems** are

PROGRAM:

SUNDAY, JUNE 16

9:00 a.m.—6:00 p.m. Jack Daniels' Day Tour and visit to Tennessee Walking Horse Farm
 Noon Registration Opens
 9:00 p.m. Registration Closes

MONDAY, JUNE 17

8:30 a.m.—7:00 p.m. Registration Open
 10:00 a.m.—3:45 p.m. Business & Technical Sessions
 4:00 p.m.—5:00 p.m. CATA Membership Meeting
 5:30 p.m.—6:30 p.m. EXHIBITOR'S RECEPTION
 7:30 p.m. Old South Gala Dinner Party

TUESDAY, JUNE 18

8:30 a.m.—5:00 p.m. Registration Open
 9:00 a.m.—Noon Business & Technical Sessions
 Noon—5:00 p.m. CATA '85 Exhibit Hall Open
 1:00 p.m. Action Demonstrations in Exhibit Hall
 2:00 p.m.—4:00 p.m. Consultant's Corner in Exhibit Hall
 4:00 p.m. Action Demonstrations in Exhibit Hall
 5:00 p.m. Exhibit Hall Closes

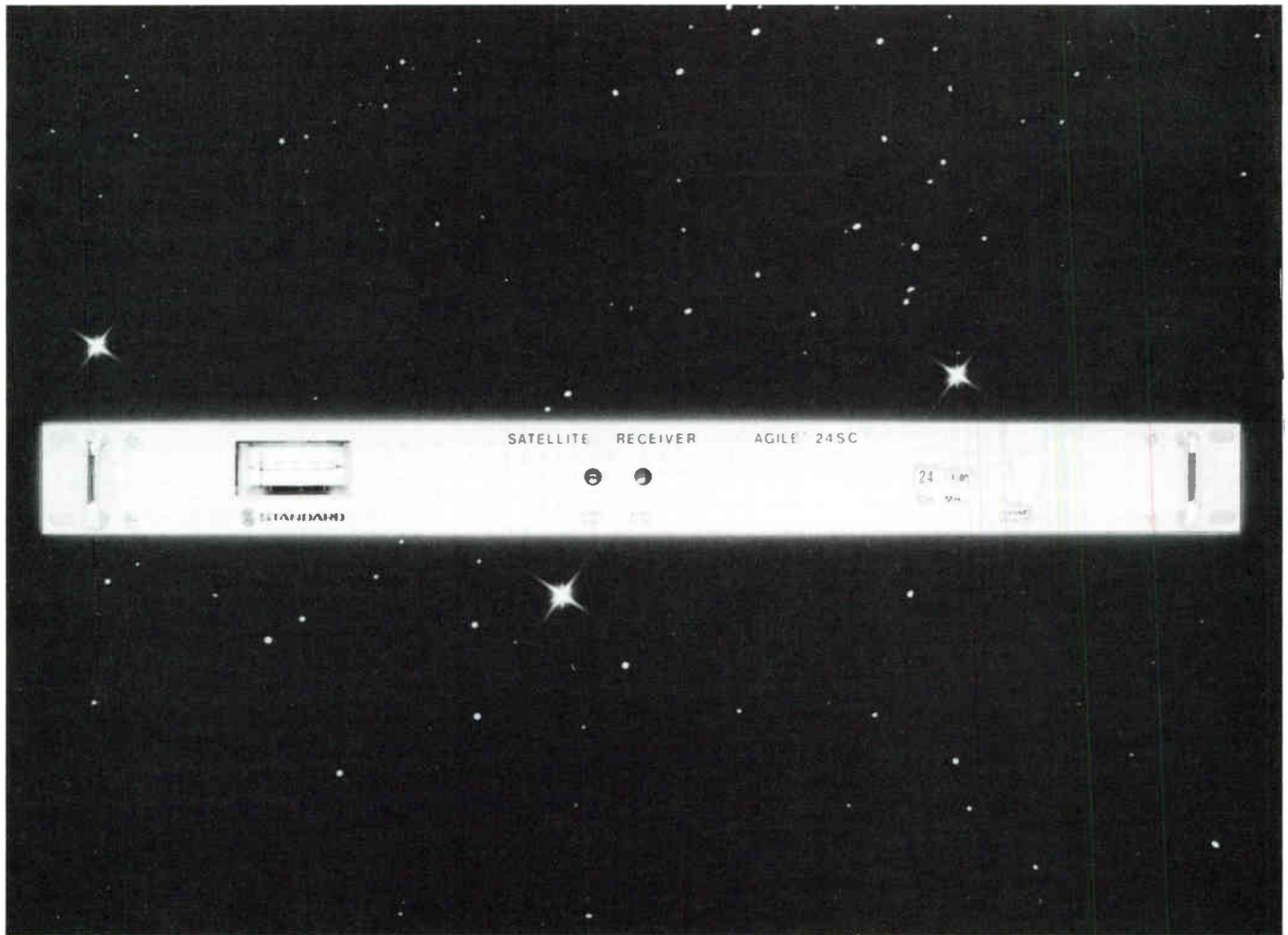
WEDNESDAY, JUNE 19

8:30 a.m.—3:00 p.m. CATA Departure Lounge/
 Registration Open
 9:00 a.m.—12:30 p.m. CATA '85 Exhibit Hall Open
 10:00 a.m. Action Demonstrations and
 Consultant's Corner,
 Exhibit Hall
 12:30 p.m. Exhibit Hall Closes
 12:30 p.m.—2:30 p.m. CATA '85 Annual Luncheon -
 "The Second Decade"
 2:30 p.m. CATA '85 Adjourns

\$175 for operators, \$150 for Spouses and additional Adult Family Members, and \$125 for CATAKids. These advance registration rates apply until May 15. After May 15, fees are increased. Non-member firms will pay more than CATA Member rates. Registration is all-inclusive so lively crowds will be expected on Sunday's tour and at Monday night's party. CATA has arranged for special airline programs with Republic Airline and US Air. The Opryland Hotel is looking forward to this return engagement and there are numerous new additions to the hotel complex to interest everyone attending CATA '85.

For registration information, please call the CATA Show & Meeting Management Office, 703-823-6522. They'll be happy to get the information to you. Don't miss out on this one. CATA '85 has all the components for success!





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No other manufacturer can back its receivers and LNBC's like this, because no other satellite supplier can match the reliability of Standard's Agile line.

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800/243-1357
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Engineered to a new standard.

There seem to be a lot of problems in the cable industry about house drop installations. Most of these concern proper grounding of the television cable so that the installation meets the required electrical codes and does not cause any problems to the utilities (electrical, gas, and telephone) in disruption of their services or alteration of service code requirements.

Every cable television company or system should have an established installation procedure to insure that they meet all of the code requirements and provide **proper grounding protection of the house drop service**. In this article, we will address specific minimum requirements that should be observed, as well as certain restrictions and limitations that may have to be considered.

Generally speaking, the average house drop should be fed from the distribution tap that was selected by its size and physical location to the building where service is to be installed, with the placement of a ground block or groundable splitter in the vicinity of the electrical utility service (meter) box. The output connection(s) from the ground block and/or splitter would then be routed to the point(s) of entry best suited to



house drop service

*by Ralph A. Haimowitz
Director of Engineering
American Cablesystems of Florida*

GROUNDING OUT:

*not necessarily
baseball
terminology*

provide the cable service to the television set(s). The purpose of installing the ground block/splitter at the location of the electrical power meter is to bond together the cable television house drop with the utilities ground.

In most instances, the electrical power service meter is installed on a side or rear wall of the building serviced. Examination of this meter box will show that a ground wire has been connected between this service box and a utilities ground. In many cases, the utility ground will be a ground rod that has been driven into the earth just below the meter box, or a cold water pipe that is nearby. Frequently you will find that the telephone service to the building also has a ground wire bonded to this same utilities service ground. The procedure is to attach a ground wire between the cable television ground block/splitter and this same utility ground through the pressure bond technique.

Common bonded grounding between utility services for house drops is the preferred method of grounding for the same reasons that we do common bonding on poles or pedestals where there is adjacent power and telephone service. Installation of a separate ground rod can create serious problems, including the hazard of house fires, because of the difference in potential between the cable and utility grounds. At the least, one could anticipate probable damage to the subscriber TV set or cable drop when there are surges in the

power during electrical storms. **One important word of caution!** You must check your local electrical codes to see that this type of common bonding is permitted. There are some areas where the local electrical code specifically prohibits the cable companies, telephone companies, and power companies from bonding to a common utility ground, even though there are evident hazards in this separate grounding method.

Another item that is not just overlooked, but is almost completely omitted from cable television grounding procedures, is determining if a ground is adequate or not. The National Electric Code calls for an electrical ground of 25 ohms or less. Although a building's utility ground probably met or exceeded this specification when it was first installed, the probability of the resistance value changing due to corrosion at the bonding joint is extremely high over a period of time and may no longer meet specifications. Also, what is the resistance to earth ground if the cable system installs its own ground rod? We should **never** just assume that there is a good ground. Measurements of earth grounds can be easily made with a simple testing instrument such as a Direct Reading Ground Resistance Tester that will give you the actual resistance level to ground. These instruments only cost about \$390.00 and every cable system should have at least one in use. Indeed, we should not only be using this tester to

insure that new grounds meet minimum requirements, but we should also occasionally use it to check older grounding systems to insure that they are still within the minimum specifications.

Most ground rods today are either solid copper or steel that has an exterior coating of copper bonded electrolytically for corrosion resistance. It is important to maintain similar metals throughout the bonding process, and copper is compatible with brass, nickel, or tin plated bonding materials. I prefer a bonded copper ground rod with a clamp made of silicon bronze alloy and #12AWG solid copper, jacketed ground wire for a hot galvanized clamp when connecting to galvanized pipe.

The length of a ground rod in the soil is a significant factor in lowering the resistance. In general, doubling the length of a ground rod reduces resistance by about 40%. Since short ground rods (4 or 5 feet in length) do not provide a good, low resistance to earth ground path in most soil areas around the country, and the fact that the lower resistive path is preferred, the standard eight foot ground rod should be considered as a "normal" starting length. Where a minimum of 25 ohms or less to ground cannot be obtained with an eight foot ground rod the use of extendable length sections should be considered. Another possibility is installing multiple ground rods to provide parallel paths. The resistance reduction of two rods of the same length and depth of placement is about 60%. If three

rods are used, the reduction is about 40%, and with four rods, about 33% more. When using multiple ground rods, you must space the rods so that they are further apart from each other than the length they are immersed into the soil.

The information in this article should help the installer in obtaining a reliable earth ground for most cable installations if he follows these **rules** of grounding.

1. Check local electrical codes for requirements.
2. Use the common utility ground when possible.
3. Measure the earth to ground resistance for 25 ohms or less.
4. Use compatible materials for bonding.
5. When installing your own ground rod be sure it is long enough to do the job.
6. Tighten all pressure bonds to insure a good mechanical bond without overtightening to the point where the ground wire is crimped or flattened out.
7. Use a chemically inert, non-conductive grease compound at bonding joints to seal the bond from air and moisture to prevent corrosion.
8. When grounding to a cold water pipe system be sure that it is extensive enough to provide a good, low resistance ground and metallic throughout without any insulating couplings or PVC sections. □

FOR UNDERGROUND HOUSE DROPS **L-1 CABLE LINE LAYER** **10 YRS PROVEN**

LINE WARD CORP.

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January, 1985

\$25,000,000 Senior Secured Financing
and
\$10,000,000 Subordinated Debt

have been arranged for
Gulfstream Cablevision of Pasco County, Inc.
Pasco County, Florida

The above referenced financing was arranged by the undersigned. This notice appears as a matter of record only.



COMMUNICATIONS EQUITY ASSOCIATES

851 Lincoln Center
5401 W. Kennedy Blvd.
Tampa, FL 33609 813/877-8844

Sold

D.H.L. CABLE T.V., INC.

Serving
Valliant, Oklahoma

The seller was represented by the undersigned



CHARLES GREENE ASSOCIATES
A Division of AMCOM, Inc.
Building E Suite 200
5775 Peachtree-Dunwoody Road, N.E.
Atlanta, Georgia 30342
(404) 256-0228

This notice appears as a matter of record only. December, 1984.

January, 1985

Acquired

**Gulfstream Cablevision
of Pasco County, Inc.**

has acquired certain assets of

**Storer
Communications, Inc.**

Serving more than 25,000 basic subscribers
in Pasco County, Florida.

CEA represented the buyer
in this transaction. This notice
appears as a matter of record
only.



**COMMUNICATIONS
EQUITY
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Tampa, FL 33609 813/877-8844

**PROGRAMMING
NOTES:**

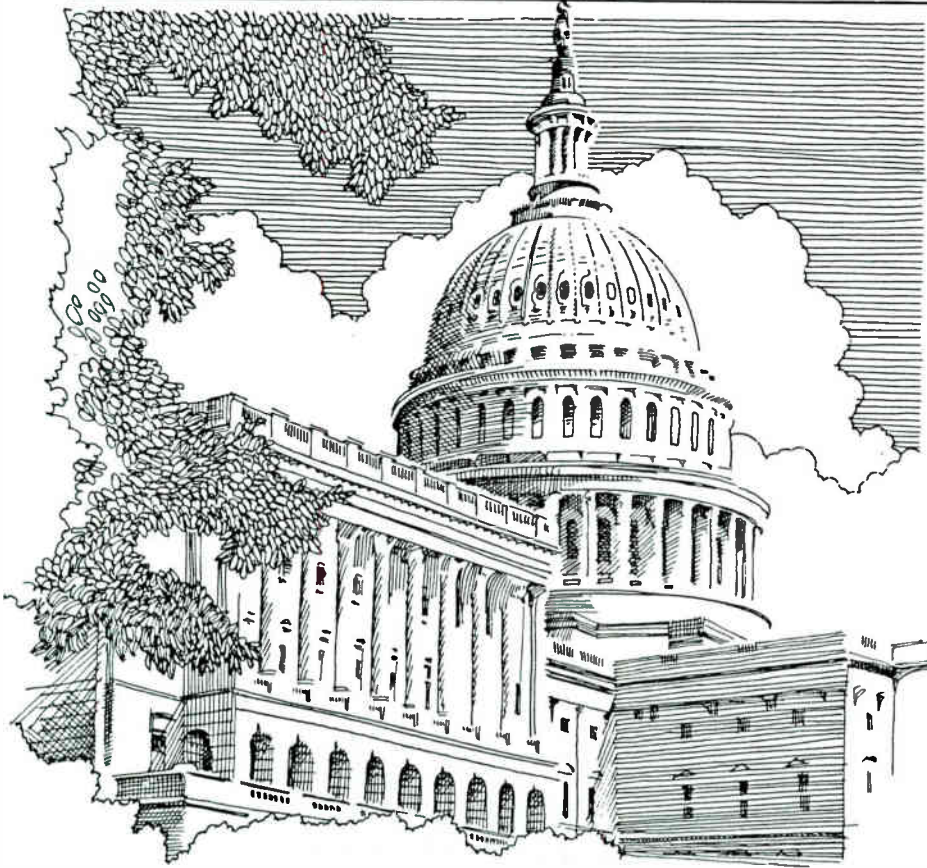
(continued from page 6)

**THE LIFETIME CABLE
NETWORK**

The Lifetime cable network presented a program, produced in cooperation with the American Lung Association, called "Call It Quits: A Smoker's Informathon". The two hour telecast was educational and entertaining with celebrity appearances and skits, and the more sobering accounts of the difficulties in stopping smoking. This program was aired three times the end of March and provided the opportunity for an interactive health event with viewers invited to call a toll-free number during the initial telecast to question physicians and other smoking-cessation experts who were present in Lifetime's studios. Experts talked about the available smoking cessation programs: those which work and those which don't — and their cost...about the addictive pleasure smoking provides, reinforced by the gratifying psychological and social behaviors of smoking; a secondary target audience was teenagers, with an attempt to persuade them not to begin smoking, but to remain non-smokers until they are 21 years, with the hope that they will then never pick up the habit.

Various health information was presented to help smokers decide to drop their habit, and the entire program presentation was powerful in its message and its participation. Again, Lifetime has dealt with a difficult health problem by telecasting their 9th Lifetime Informathon, with more planned in the future. □

W·a·s·h·i·n·g·t·o·n U·p·d·a·t·e



by
Stephen R. Effros
CATA's Executive Director

CABLE WINS MAJOR FIRST AMENDMENT COURT VICTORY

We'll start right out by saying that it is in no way clear what this is all going to mean. But as you have undoubtedly heard by now, or seen in your local newspaper, the Court of Appeals for the Ninth Circuit has ruled that cable television operators have substantial First Amendment rights that may be violated by city grants of exclusive franchises.

In essence the Court ruled that the City of Los Angeles may not have a franchise "auction" that grants a franchise to only one bidder if there is additional space on the utility poles and conduits

that would allow more than one party to operate a cable television system. The decision came on an appeal by Preferred Communications, which was denied a franchise for an area of Los Angeles and then refused to participate in the bidding process for that franchise. Preferred argued, through its attorney, Harold Farrow, that the entire franchise process violated the antitrust laws, and the First Amendment rights of the prospective cable operator. The city said that access channels should suffice to protect the First Amendment rights of anyone not winning the franchise contest, and that they were immune from an attack on antitrust grounds because the action was sanctioned by the State. The lower court threw the case

out, agreeing with the city on both points. The Appeals Court has now said that while the antitrust argument is invalid, there is a legitimate First Amendment claim, and, therefore, the lower court should hear the case based on the question of whether the First Amendment rights of Preferred were indeed violated.

The case has very broad implications, and, as we said at the outset, most of those implications will take some time to sort out in the courts, so it is not really clear what the net result of this case is going to be. One of the most interesting aspects of this decision is that it may have far greater impact on areas not directly connected with the case than with the issue that was before the court. Here's why:

The Court recognized, for the first time, a broad First Amendment right for cable television. It specifically indicated that the analogy of cable television with television regarding First Amendment analysis is wrong. That in fact cable is more analagous with newspapers, theatre owners, concert promoters, and the like. In a footnote the court made this very clear by saying; "...In addition to originating their own programming, cable television operators exercise considerable editorial discretion regarding what their programming will include... Editorial judgement is entitled to First Amendment protection... Undeniably, cable operators do transmit programs produced by others. To the extent an operator does so, however, we believe it would be treated for First Amendment purposes as would be theater

owners, booksellers, and concert promoters. Their First Amendment protection is not diminished because they distribute or present works created by others."

Now that is quite a statement! It is particularly welcome to CATA and the many others who have been waging a First Amendment challenge to the FCC over the "must carry" rules for all these years! Ironically, the oral argument before the U.S. Court of Appeals for the District of Columbia in the Turner Broadcasting and Quincy

"The Court recognized, for the first time, a broad First Amendment right for cable television."

cases — the "must carry" cases — is coming up on April 16. This decision comes at just the right time for us to point out to the D.C. Court that our view of our First Amendment rights is now apparently shared by the 9th Circuit panel which heard the Preferred case. And lest anyone dismiss the importance of the decision because the 9th Circuit has a reputation for being "liberal" and being overturned a great deal by the Supreme Court, it should be noted that the decision was written by Justice

Sneed, a conservative, Nixon appointee.

It, therefore, may be that the first major result of this case which, after all, is far from over and deals mainly with access to poles and conduits and city franchise procedures, is that cable will have a much better shot at defending our First Amendment rights against the blatant abridgement of those rights embodied in the "must carry" rules! That certainly would be a "win" for cable, and would be very well worth the fight. But that is not all this case may stand for.

The Court was very careful to frame the issue before them narrowly. The central question, as phrased by the Court, was: "Can the city, consistent with the First Amendment, limit access by means of an auction (franchise) process to a given region of the city to a single cable television company, when the public utility facilities in that region... are physically capable of accommodating more than one system?" The Court very clearly said the answer is no. However the Court was also very clear in saying what it was **not** deciding. It took no position on what would or should happen if in fact there wasn't space for more than one operator on the poles — in this case the Court said that under prevailing precedent it had to assume that the statements of the Plaintiff were correct, that there was sufficient room for more than one. The Court also said that it was specifically not ruling on questions of the validity of various requirements called for in the city's franchising process. Those are two very big open questions.

Thus, what the Court's main pronouncement was is limited to the proposition that cable construction on utility poles is apparently in and of itself a "communicative activity" and that poles, and such are considered to be "public forums" for the purpose of constructing cable systems. Therefore, said the Court, any unnecessary restrictions imposed by the City on such an activity are violations of the First Amendment rights of operators, or would-be operators.

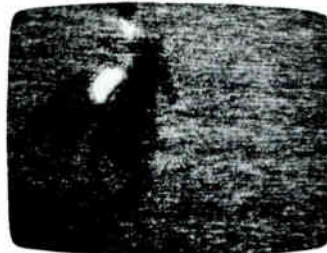
In footnotes and in the general tenor of the decision the Court gives a very strong indication of what it thinks about the extent of what it said. For instance, there is a footnote that states that the new cable legislation, in so far as it suggests that a city may limit the grant of cable television franchises to "one or more" operators is probably invalid. They also suggest that access requirements in particular raise "...troublesome constitutional questions". The Court went on to say that even though some of the other cities who filed "friend of the court" briefs in the case suggest that there are other good reasons for imposing franchise restrictions, such as the concern about "cream skimming" and access, and wanting the best "state of the art" system, the record before the Court did not appear to sustain any of those claims in that the City had not proved that it had a "substantial interest" in those issues. More importantly, the Court said that because any restrictions or limitations imposed on a prospective operator (again assuming there is space available on the poles) would

have to pass stiff First Amendment tests, "...the City must justify its regulations in terms of its own problems. It may not rely on the problems faced by other communities or on justifications that are merely conclusory and speculative."

That could turn out to be an extremely important articulation of the test to apply to any regula-

tion the city may wish to impose on cable franchisees in the future. For instance, if we assume that the First Amendment rights of cable operators are sustained as this case first goes back to the trial court and then undoubtedly winds its way up to the Supreme Court, the question will become what limitations and regulations are valid? The Court clearly says that the

TERRESTRIAL INTERFERENCE.



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industry leaders such as California Amplifier and Scientific Atlanta. The result of their effort is an in-depth exploration of such topics as equipment selection for minimizing TI susceptibility, use of natural and artificial shielding, system filtering, and many other cost effective techniques! Send this coupon now to receive our free brochure on ASTI, and get TI out of the picture!



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 Company Name _____
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Send to: CATJ Magazine,
 4209 N.W. 23rd St., Suite 106, Oklahoma City, OK, 73107

Calendar of Events

APRIL

9-11 Canadian Cable Show

Metro Toronto Convention Centre, Toronto,
Canada Contact: CCTA (613) 232-2631

16-18 Oklahoma Cable Television Association

Meeting Sheraton Kensington, Tulsa
Contact: Jay Allbaugh (405) 840-9552

16-18 CAST '85

National Exhibition Centre, Birmingham,
U.K. Contact: Mark Voss (713) 463-0502

MAY

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

JUNE

2-5 National Cable Television Association Annual Convention

Las Vegas Convention
Center, Las Vegas, NV
Contact: NCTA (202) 775-3550

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

17-19 CATA '85

Opryland Hotel, Nashville, TN.
Contact: CATA (703) 691-8875

JULY

9-11 Cable '85

Brighton, U.K.

Contact: Online Conferences (212) 279-8890

AUGUST

4-7 CTAM Conference

Fairmont Hotel, San Francisco, CA.
Contact: CTAM (404) 399-5574

25-27 Eastern Cable Show

Congress World Center, Atlanta, GA.
Contact: Southern Cable Television Associa-
tion (404) 252-2454 □

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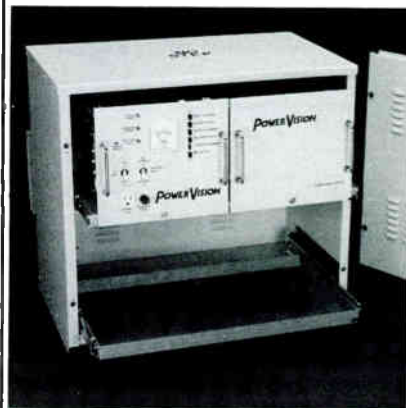
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city may impose “legitimate” conditions, but it leaves open the question of what conditions on the grant or the process of granting franchises are “legitimate”? This is left to future cases. However, at least in the 9th Circuit, the standard for testing legitimacy is now clear. The burden is clearly on the city, and the city may not rely on problems faced by other communities, and may not base its restrictions, regulations, or processes for granting franchises on justifications that are either conclusory or speculative. That is a very broad and difficult standard to meet. For instance, the city may conclude that cable is a “de facto” monopoly, and thereby try to justify its regulations based on that (indeed, that is the justification that has been used for years). But the Court indicates here that it will not necessarily accept such a justification since it is conclusory — and not based on any evidence, since the City has never allowed competing cable companies to operate. Almost all the other requirements that we have become so used to in bigger city franchise fights are similarly suspect since most of them are based on “conclusory” and “speculative” justifications. If this Court’s decision on our First Amendment rights is sustained, and its criteria for testing the validity of franchise requirements is adopted, then there will be very little left in the way of franchise regulation of cable television — other than, of course, their appropriate role of assuring the safety of the use of the streets and ways under their “police powers” once all of this gets sorted out!

We would caution you, however, there is a long way to go between here and there! The Court’s decision could be appealed by the City requesting a full rehearing by the entire 9th Circuit panel of judges immediately, or they could appeal to the Supreme Court. Alternatively the City could bring in all sorts of evidence in the now mandated lower court proceeding and prove its case to the satisfaction of the court that the regulations are justifiable. Lots of things could happen. We will just have to hold on and watch the saga unfold.

The principal legal question that you will hear debated is the so-called “public forum” doctrine which is the basis of any First Amendment claim by cable operators. This theory is best spelled out in a book on cable and the First Amendment written by George Shapiro, P. Kurland and J. Mercurio. The book, entitled “Cablespeech — The Case for First Amendment Protection” is favorably cited by the Court and outlines the basic argument which the Court adopted. It is one that Washington cable attorney George Shapiro has been preaching for some time, and he did so again, very effectively, in this case in a “friend of the court” brief he filed on behalf of ATC. The resolution of that argument by the Supreme Court — whether the poles and conduits constitute a “public forum” will eventually tell the tale. Even, however, if the ultimate answer is no, the ruling in this case is going to have major repercussions because operators already using the poles would appear to

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have far more First Amendment legitimacy today than ever before. The Court clearly equated cable with newspapers rather than television stations — an argument we have all been making for years. That in itself is a major advance.

So what are the near-term results of this case? Well, the first is likely to be confusion. The Appeals Court threw out the argument

to meet the same requirements as the original operator. Any good operator should not fear competition. The problem comes in when one operator in an urban build has been forced to build a “gold plated” system under requirements that are now no longer valid and a new franchisee can now come in and build a less costly, and, therefore, much more competitive

“The Court’s main pronouncement was limited to the proposition that cable construction on utility poles is apparently in and of itself a ‘communicative activity’...”
“Any good operator should not fear competition.”

about antitrust violations that some attorneys have been pinning their hopes on for some time, but it substituted that issue with a far more potent First Amendment defense for operators against abuses. Cities will have to be far more cautious from now on in imposing regulations and in restricting the grant of cable franchises. This could have a major impact on any ongoing renewal battles.

Of course, on the other side, it could well mean that there will be some renewed efforts at overbuilding. Now CATA does not oppose overbuilding so long as all the parties are on equal footing — that is, the “new” applicant is obliged

system. That could present major problems, and we have no suggestions as yet on how to deal with them.

Our apologies for spending so much of this issue on one subject, but it is clearly a major one, and one whose implications you had to know and understand. Naturally, as this case and ones like it proceed through the courts, we will keep you informed. This is one of those situations where we can only report at this time that a very large stone has been thrown into the middle of the pond — we don’t yet know what will happen as the ripples move out from the point of impact.

AERONAUTICAL NOTIFICATIONS — AN INTERIM FORM FOR INTERIM RULES

Since many of you have indicated that this is the construction season and you need some help on wading through what the FCC wants in the way of filings for the interim aeronautical frequency rules, we are giving you a format here that you can follow. Please note a few things about it. First, it was designed as an application by Mark Palchick (202-659-4400), an attorney in Washington who has been helping us out with this mess. He filed this basic notice for CATA’s Chairman, Pete Athanas, and the Commission has already approved the proposed signals, so we know this format works. **HOWEVER, THIS IS NOT A SIMPLE FORM.** There are certain parts that you will have to create on your own based on the actual facts in your particular situation. Once the rules are final we will issue a CATAform for the CATA Briefing Book. Until then, you can use this as an outline of what you must file (and then you must wait to hear back from the Commission, as we explained in the last issue).

1. A letter should be addressed to: Mr. William J. Tricarico, Secretary, Federal Communications Commission, Washington, D.C. 20554
2. The opening paragraph should state the following:

XYZ cable company hereby notifies the Commission of its intent to use the following frequencies on its CATV system which serves the community of _____. The

following information is provided in accordance with Section 76.615 of the Commission's Rules.

3. The geographic center of the system is _____ N

_____ W

4. The maximum radius on any azimuth from the geographical center of the system is _____ miles.

5. Frequencies (NOTE: This list assumes you are offsetting up, rather than down from the base frequencies — you can do it either way.

Channel	Visual	Aural
A	121.2625	125.7625
B	127.2625	131.7625
C	133.2625	
K		227.7625
L	229.2625	233.7625
M	235.2625	239.7625
N	241.2625	245.7625
O	247.2625	251.7625
P	253.2625	257.7625
Q	259.2625	263.7625
R	265.2625	269.7625
S	271.2625	275.7625
T	277.2625	281.7625
U	283.2625	287.7625
V	289.2625	293.7625
W	295.2625	299.7625

6. Legal name of system:

7. Community served and FCC Community Code Number:

8. Name and Telephone number for FCC to call with approval:

9. NOTE; Now here is the tricky part. You must tell the Commission how you are going to comply with the rules. You must indicate that you are in compliance with the signal leakage rules of the Commission, that you have a procedure, whether it is by using monitors in your truck all the time or some other means of monitoring the entire system at least once every three

months, that you correct and log the leaks you find, that you will do a "cumulative leakage index" report for the Commission by July 30, 1985 and the technical characteristics of the equipment you are using to detect leaks. (See the February issue for more

"...it would seem that one of the 'conditions' we might challenge in the future is ANY rate regulation!"

details.) The following is only one example of what must be said to the Commission in a notification of this type — naturally if you do not use this type of equipment, or you have another way you intend to monitor to comply with the quarterly monitoring rules, you should state that. **DO NOT USE THE FOLLOWING AS YOUR APPLICATION STANDARD IF IT DOES NOT ACCURATELY DESCRIBE YOUR SITUATION! IT IS ILLEGAL TO FILE INCORRECT INFORMATION WITH THE COMMISSION ON A NOTICE OF THIS NATURE!**

This is just a sample:

This notice is in compliance with the January 30, 1985, public notice with respect to

the second Report and Order in Docket 21006 and the Interim Operating Rules thereto. The cable system operated by _____ is in compliance with the basic signal leakage criteria of Section 76.611 of the Commission's Rules. In particular,

_____ routinely monitors its system for signal leakage in accordance with Section 76.614 of the Commission's Rules. The system is equipped with a modulated radiation detection carrier (a Coo-Coo). Each system technician has an FM receiver tuned to that carrier in their vehicle and monitors their service area for radiation daily. By equipping every vehicle with leakage monitoring receivers, _____

is assured of covering the entire service area within a three month period. The leakage detection equipment used is capable of detecting leaks of levels of 20 microvolts per meter at three meters and the equipment is presently operating at _____ MHz.

All leaks which are detected are assigned for repair to a technician equipped with _____.

All leaks which produce a field strength in excess of 20 microvolts per meter at 3 meters are promptly repaired. _____

maintains a log listing the date and location of each leak identified, including the date of repair and the probable cause of the leakage. The log is maintained in our offices for a period of two years.

_____ hereby states to the Commission that it will submit a cumulative leakage index, consistent with the January 30, 1985 Public Notice, for the above-referenced system on or before July 30, 1985.

10. Frequency Tolerance: +/- 5 kHz which will be maintained by the operator at that tolerance.

11. Power:

The power of the visual carriers will not exceed 48 dBmV (not more than -7.5 dBm)

The power of the aural carrier will not exceed 33 dBmV (not more than -15.75 dBm)

12. Modulation:

Standard Television Transmission

Video — AM modulation

Aural — FM modulation

13. Signature and date

That should give you a good idea of what one of these notifications should look like. They are not that hard so long as you have all the elements. The Commission is being very sticky about your saying, for instance, what the capability of the equipment you are using is. Obviously, if it does not meet the standard as outlined above, they will not give you the ok! Please, folks, **read this stuff carefully**, and remember that it is not a form, just a sample — you must put in the **accurate** descriptions of what you do, and the equipment you use in your system. If you do not have a mechanism or plan to monitor your system on a quarterly basis yet, you had

better get one — for your subscribers' sake as well as for the application! If you have any questions, just yell.

SPEAKING OF COPYRIGHT —

Doesn't it seem like we are always speaking of copyright? Well, for this month just a few thoughts. To begin with, we are in the formative stages of drafting an "inequities" bill, as we mentioned in the last issue. Happily, the NCTA Board has now agreed with the "inequities" approach, and we have every reason to believe that the industry will be able to put together one bill to propose. We are working on the language right now. We'll have more details next month.

"...make sure your city officials know about the new cable law, ..."

Another approach to the whole copyright problem is to see if we can "rethink" the whole thing. This comes at a particularly important time since cable operators are talking more and more about redesigning their marketing around basic services. The penalty for doing that, of course, is that all the basic fees go into the calculation of copyright fees. Thus the fees go up even though the broadcast services cannot be increased with-

out stiff penalties. There is lots of quiet talking going on about the whole structure of copyright as it is now, and we will have more on that for you in the near future.

One thing that is clear, however, is that nobody on any side of the issue is particularly anxious to get these issues back before the CRT! That organization is the classic "loose cannon" on the deck, so great efforts are being made to settle differences rather than risk another aberration such as the 3.75% decision. The first area of agreement is likely to be on the question of the amount of any increase based on the cost of living, which is a subject up for review this year. You will probably hear about a joint filing and agreement among the parties on the new rates by the time this issue reaches you. The details are not fully worked out yet, however, so we can't print them in this issue.

FCC ISSUES SEVERAL NEW CABLE DECISIONS

No, not the one you are most anxious about. The Commission has not ruled on the "effective competition" rulemaking, and is not expected to until sometime in April. We will all have to hold our breath until then. The betting, however, given the solid econometric proof the cable industry supplied to the Commission and the pure rhetoric everyone else filed, is that they will go with something like a two or three signal standard based on the "must carry" criteria for reception (35-mile zone, Grade B, or Significantly Viewed) and they will not include a requirement that competition is based on the reception of specific signals — that should especially

be the case now that the "Preferred" case has been decided in our favor regarding the First Amendment! In fact, it would seem that one of the "conditions" we might challenge in the future is ANY rate regulation! After all, a competing cable company, or the potential of one, is the absolute in the nature of "effective competition"! We have to keep our rates reasonable, regardless of where we are or how many other signals are around, or, based on this latest case, we are inviting an overbuild!

Other decisions by the Commission include one that eliminates most of the requirements regarding the maintenance of public inspection files and the retention of subscriber records. The only one left in Sec. 76.305 is (7), regarding origination cablecasting by candidates for public office, sponsorship identification and EEO. Section 76.306, regarding keeping subscriber records, was deleted completely.

The Commission also issued two new rulemakings. One dealing with technical standards, which would substantially eliminate those standards, except for signal leakage, on the ground that most of the standards for equipment today in the cable industry are higher than what the Commission's rules call for, and another rulemaking spelling out what the FCC thinks it must do to comply with the EEO provisions of S.66. Needless to say, they have decided that more reporting is necessary. The full document is not out yet, so we can't really say whether it is good or bad. From the public notice, however, it would appear that the Commission is being reasonable.

We'll have more details in the next segment of the Washington Update.

36 MONTHS TO GO — WHAT SHOULD I DO

The calls are starting to come in from operators who have just reached the magic "36 months to go on my franchise" point and want to know what to do. Well, as you can tell from the long piece in this issue regarding the Preferred case, that is no longer an easy question to answer if you take into account the changing ground on our First Amendment rights. But leaving that aside for the moment, one thing is sure. You should

"...we have some pretty powerful 'arrows' to shoot should a fight come."

make sure your city officials know about the new cable law, and that if they don't initiate a "needs assessment" type of proceeding, you will formally request one. You must look at the timetable in the new law and make sure the city sticks to it. At the same time you should be talking to them about an amicable renewal process that does not involve all the nonsense written into the law. Then, upon a friendly renewal, you can all go about your business. But if that is not in the cards, you want to make sure the formal timetables are complied with so that you are

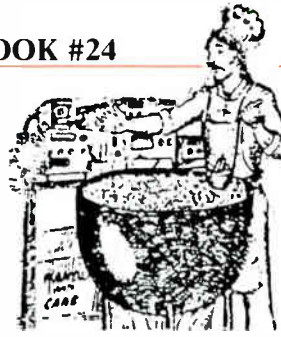
not accused later of not complying with the law and thereby losing your rights. We don't think you would lose your rights in any event, but it's better to follow the timetable!

Having said all that, we have to admit that the new First Amendment wrinkle that has been thrown our way certainly makes the prospect for renewal even brighter. The theoretical problems inherent in the decision will take a long time to thrash out, but that uncertainty and confusion can only work in favor of the cable operator. The advice city officials must be given in this set of circumstances is that they should be very cautious of any action taking or limiting cable operator's rights in any way right now. To view it otherwise would just open up the city to a suit. Nobody wants to sue. We want to go about the business of offering cable television service to our subscribers! But it is becoming clearer every day that with both S.66 and the Preferred decision now in our "quiver", we have some pretty powerful "arrows" to shoot should a fight come.

STEALING SATELLITE SIGNALS

Given the importance of explaining our new legal position regarding the First Amendment we did not have enough room left in this issue to supply you with the sample letter we promised last issue on telling your local SMATV operator what the new law satellite theft means to him. We have a sample "informational" letter, as we described in the last issue, and a "follow-up" letter on the drawing board and they will be forthcoming. □

By: Terry Owens
Glyn Bostick
MICROWAVE FILTER COMPANY, INC.



Selecting Good, Negative Pay-TV Traps

Summary of Electro-Mechanical Tests Suggests a Quick, Simple Test

LAST TIME

Each of six previous installments of this column (See Table) reported laboratory tests on one important

performance characteristic of Pay-TV traps — the type packaged in the now-familiar metal tube. For details, consult the appropriate back issue of CATJ:

The "SHERMAN SHOCK MACHINE" in Action: Dave Sherman drops the trap samples on concrete floor. Samples were mounted in the open wooden fixture, clamped down to prevent connector damage.

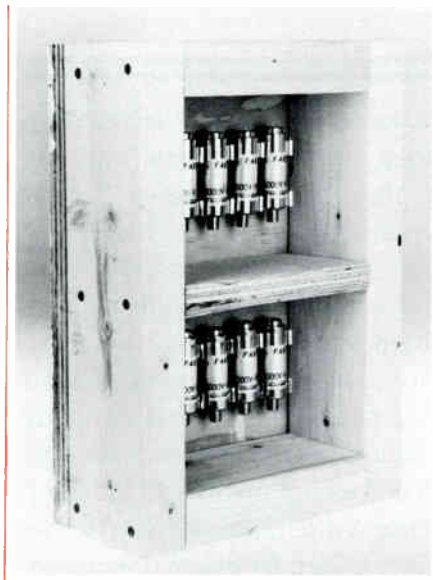
CATJ Issue:	Column Title:
September, 1984	Pay-TV Traps and CATV Signal Leakage
October, 1984	Increase Cost-Effectiveness of Pay-TV Traps — Make sure they'll do the job before you install them
December, 1984	Case Signal Leakage of Pay-TV Traps: Some Test Results
January, 1985	Temperature Stability of Pay-TV Traps: Some Test Results
February, 1985	Effect of Moisture on Pay-TV Traps: Some Test Results
March, 1985	Effect of Shock on Pay-TV Traps: Some Test Results

THIS TIME

We'll summarize these tests, and their conclusions, and propose a quick and easy test for choosing between brands.

SUMMARY

Except for performance when wet, the quality of metal tube video Pay-TV traps made by various manufacturers is good to high: they adequately perform their intended security function over the range of mechanical and temperature conditions. While samples tested were limited, most of these showed a high susceptibility to degrade under wet conditions.



Simple wooden pallet for drop shock testing. Large fuse clips hold the traps in place and wooden barriers protect connector leads from damage.

Here we propose a very simple test to predict the operating quality of the trap including moisture behavior and RF leakage levels. It can be used to select the "best trap" from among samples of several brands.

SUFFICIENT NOTCH (VIDEO LOSS)

All traps tested (from 7 manufacturers) had enough video attenuation to completely remove the picture and sound. For the range of TV sets now in use, it usually requires 40-50 dB of notch to do both. All test specimens exceeded 50 dB. All traps were tested with a high sensitivity TV set which required more notch loss than sets with lower sensitivity.

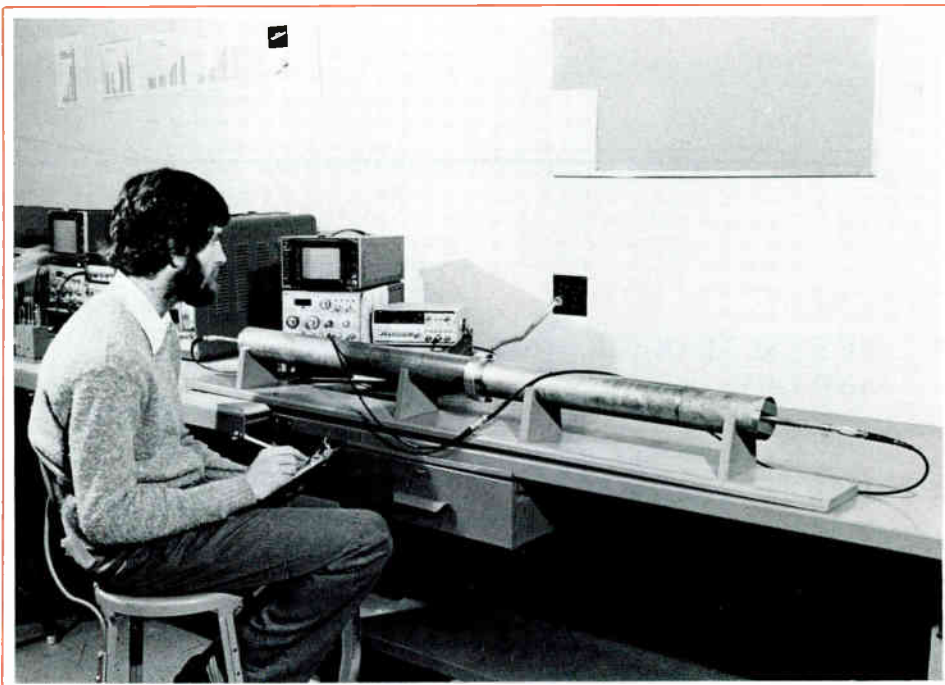


Simple "bubble test" apparatus for predicting notch loss and RF leakage increase under wet conditions. 80PSIA air is forced into the trap while it is immersed. Allow 5 minutes for air captive in output connector to leak out. Thereafter, steady stream of bubbles predicts reduced notch and increased RF leakage in wet weather or conditions of high humidity — severity in proportion to intensity of the bubble stream.

NOTCH CHANGE WITH TEMPERATURE

The specimens were tested at room temperature and the extremes expected in most systems: -30°F and $+140^{\circ}\text{F}$. Although all traps experienced a change in notch frequency, and some lost as much as 20 dB notch attenuation at the video carrier, no specimen failed to suppress video by at least 50 dB at any temperature. Hence the CATV operator need not be too concerned with this characteristic of Pay-TV traps: any reputable brand will deny the channel to the non-subscriber under normal temperature swings.

All traps **lowered** their notch frequency at high temperature, placing more attenuation on the lower adjacent sound frequency. Except for traps for the lower VHF channels (2-6) all standard brands make the



Resonant cavity for testing trap signal leakage. Dimensions result in resonance in the aeronautical range (115) MHz. (See schematic drawing in CATJ, September 1984).

lower adjacent unusable anyway. So its of no use to worry about this frequency change anyway — unless you're working at one of the lower channels. Then you **would** be concerned with absolute notch frequency stability — and might want to test samples.

NOTCH CHANGE WITH SHOCK (SUCH AS DROPPING)

Samples from 5 different manufacturers were tested, by dropping them 10 times from a height of 10 feet on to a concrete floor (see CATJ, March 1985). The effect on notch frequency was negligible: no trap changed its notch frequency more than 30 KHz — hardly enough to reduce video loss by any significant amount.

It seems that all current trap manufacturers have learned the trick of properly potting their circuits with resilient material to insure that components return to their "factory tuned" positions after shock.

EFFECT OF MOISTURE

Here we had a mixed bad: two of the three brands tested failed the moisture test. In the case of the two failures, the notch was so badly destroyed that they performed **no useful security function**. We should not be too hasty to judge the entire trap-making industry based on this data. We wanted to test the **same** channel for each manufacturer. Further, we wanted to select samples with **measurable** RF leakage. So this limited the number of test samples available and, as we will see later on, perhaps selected the specimens predisposed to malfunction under wetness. But the facts are:

1. The three samples represented three **different** manufacturers.
2. 67% (two out of three) completely failed to perform under wet conditions.

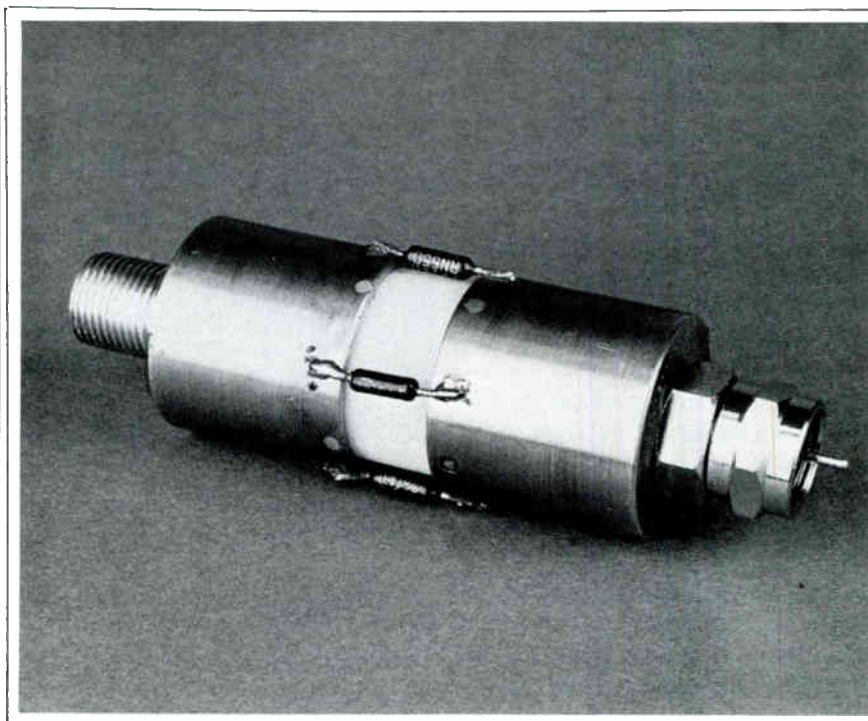
Therefore, in selecting the trap for your system, you cannot ignore a wetness test of some sort (more later). ▶

RF CASE LEAKAGE — WET AND DRY

Earlier tests (CATJ September, 1984) have shown that RF leakage is due to minute openings or imperfect metal-to-metal joints in the trap case. Earlier, we proposed a leakage limit of -65 dB, relative to the drop level, with leakage voltage measured at the point of leakage. This standard was arrived at by translating the FCC leakage standard (20 microvolts/meter at a distance of 10 feet from the cable) into a "voltage" at the point of leakage and adding a safety of -30 dB to overcome the effects of cumulative leakage of many traps in proximity. Test apparatus was also described (CATJ, September 1984).

Dry leakage tests showed that about half of the samples tested failed this proposed standard. However, considering that the proposed standard is very stringent and that worst shortfall was in the neighborhood of only 13 dB, this showing, in itself, is not considered significant.

Wet leakage is another matter, since it tends to **increase** leakage. Of the three specimens tested, one showed no measurable change between the dry and wet conditions while two showed leakage increases 10-15 dB. This confirms some reports from heavily trapped systems that there seems to be a correlation between higher system leakage test results and wet weather.



Calibrated -20 dB leakage standard. Specimen Pay-TV traps are tested against it in a special resonant chamber.

Bubbles Observed	Subsequent Notch Test
None	Dry notch preserved
Discrete, periodic	Substantial notch loss
Free bubble flow	Notch destroyed, unusable

RELATION BETWEEN WETNESS EFFECTS ON NOTCH AND LEAKAGE

Reviewing the tests from notch survival and RF leakage in wet conditions, a definite correlation emerges. The traps which failed most severely under wet conditions (notch destruction) had a higher leakage level when tested dry. And, of course, this leakage increased with wet conditions. Going back to our "bubble test" (forcing air through the trap while under water) notch

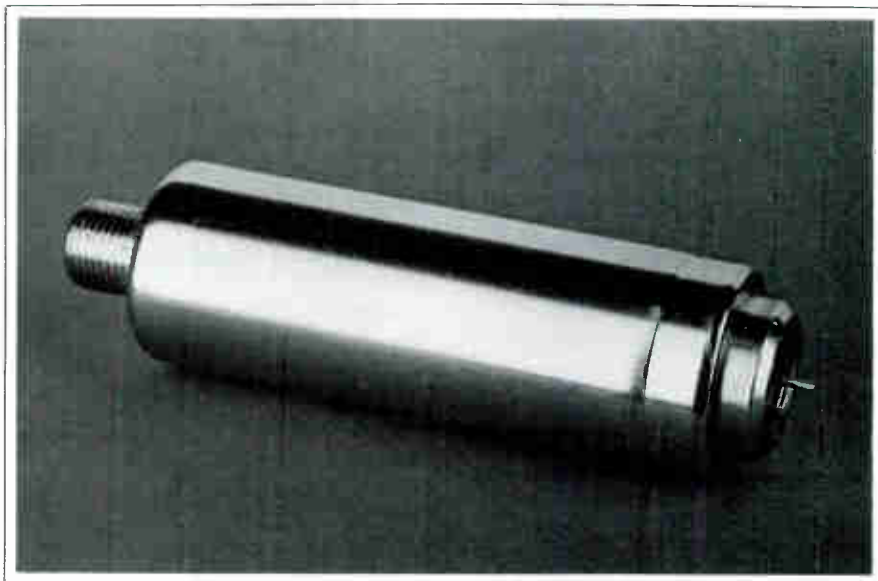
failure under moisture was quite predictable:

A PROPOSED QUALITY TEST

We can predict susceptibility to moisture by measuring RF leakage: if this is high, risk is low. But this test is not conclusive. Besides, the RF leakage test is a tough one: you need special, sophisticated test equipment.

But, if the notch is adversely affected by wetness, the RF leakage, already somewhat marginal, will increase.

Typical cylindrical Pay-TV trap. The outer metal sleeve is forced over the end plugs which are usually integral with the connectors. Hence the most likely leakage source (RF and moisture) is any clearance or imperfect metal-to-metal contact at either end of the outer tube.



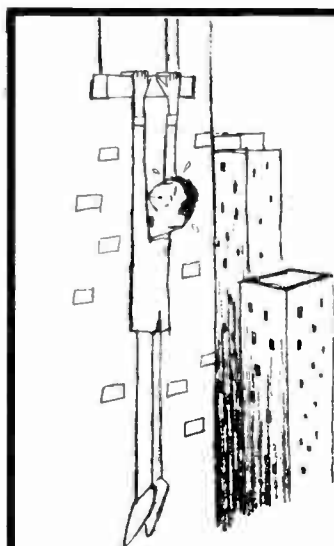
So, let's use the simple bubble test to predict wet notch behavior. If you've got time, soak all the competing brands in water for 24 hours and then test them on a spectrum analyzer, or try them out on a TV set. If not, set up the simple "bubble rig" and accept only those which give you **no** bubbles. These will have low RF leakage and will not have notch malfunction under wet conditions.

NEXT TIME

We'll compare the two major types of trapping: negative and positive and suggest some guidelines for selecting the most cost-effective method for your system.

ACKNOWLEDGEMENTS

We also summarize our acknowledgement to the fine craftspersons who made this series possible: Carol Ryan, Chris Bostick, Dave Sherman, Dave Skeval, Steve McIntosh, Marian Allen, Marian Frair, Jack Gaffield, John Greatrex, Rich Green, Bill Buck & George Slack. □



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Noise Temperature and G/T of Satellite Receiving Systems

by J. Searcy Hollis

Introduction

Noise is the combination of unwanted disturbances that tend to obscure the information content of a signal.

The limiting sensitivity of a receiving system is determined by the ratio of received signal power to noise power which just satisfies an established criterion. The criterion may be that the signal is barely detectable or that it exceeds some specified signal-to-noise ratio. The latter is the case in most practical communications systems.

Although certain types of noise, for example ignition noise and radar signals, are periodic in nature, noise which is of routine importance to satellite communications systems can usually be assumed random with continuous spectra. It will be seen that **noise**

temperature is a convenient measure of noise power with continuous spectra.

Sources of Noise

The major sources of noise in the indicated context can be separated into external noise and internal, or circuit, noise. These sources of noise are illustrated in Figure 1.

Internal noise can be broken into thermal noise and other forms of circuit noise, such as shot noise in vacuum tubes, current noise in semiconductors and movements of domain boundaries in ferromagnetic devices. Thermal noise is random electrical noise caused by the motion of free electrons in conductors. Thermal noise power is proportional to absolute temperature, which is a measure of

the thermodynamic energy of the conductor.

External noise is largely due to extra-terrestrial sources and thermal radiation from the atmosphere and the earth. Cosmic noise is a low level of extra-terrestrial radiation that appears to come from all directions. It is considered to be residual radiation due to the events that occurred during the origin of the universe.

The sun is an extremely strong source of noise, which can interrupt satellite communications when it passes behind the satellite being used and thus lies in the main lobe of an earth station's receiving antenna pattern. The moon is a much weaker source, which is relatively innocuous to satellite communications. Its radiation is due to its own temperature and to reflected radiation from the sun.

The atmosphere affects external noise in two ways. It attenuates noise passing through it, and it generates thermal noise because of the energy of its constituents. Ground radiation, which includes radiation from objects of all kinds, is also thermal in nature.

Radio Stars. Mapping the sky with radio telescopes has disclosed "radio stars" in addition to the background cosmic noise. These are discrete sources of noise which emit energy in the radio and microwave regions of the spectrum. Figure 2 is a graph which

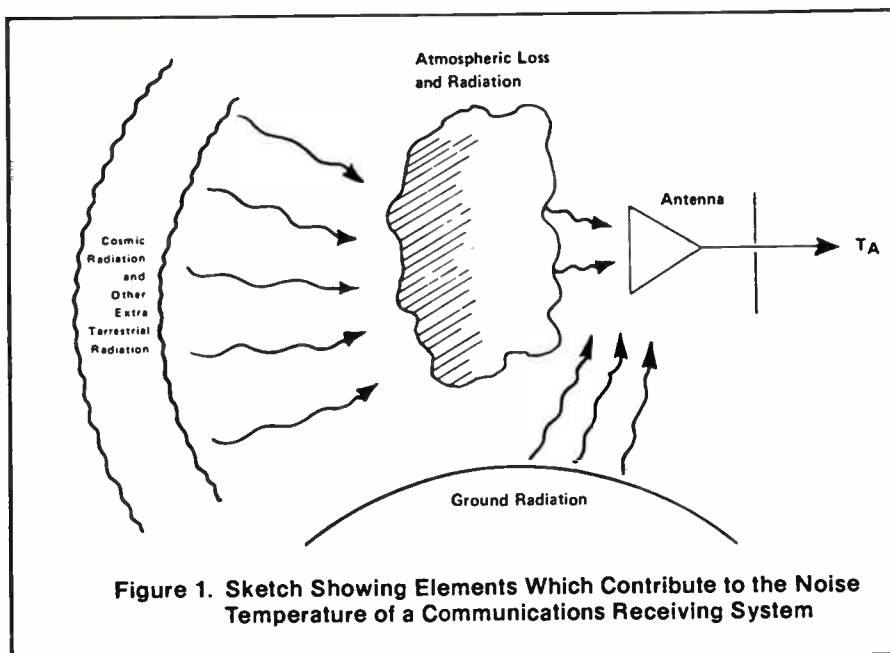


Figure 1. Sketch Showing Elements Which Contribute to the Noise Temperature of a Communications Receiving System

TABLE 1 — Radio Source Data

Radio Star	Type*	Position		Size RA' x DEC'	NL°	Visibility	
		RA ^h	Dec°			to	SL°
Cas A	SR	23.4	58.6	4 x 4	90		11
Tau A	SR	5.5	22.0	3.3 x 4	90		48
Orion A	EN	5.5	-5.4	3.5 x 3.5	65		75
Cyg A	RG	20.0	40.6	1.6 x 1	90		29
Virgo A	RG	12.5	12.7	1 x 1.8	73		57
DR 21	EN	20.6	42.2	< 0.3	90		28

* SR = Supernova Remnant
 EN = Emission Nebula
 RG = Radio Galaxy

NBSIR 74-382

shows the flux density of several radio stars, and Table 1 gives technical information about each.

The flux density from these stars is not high enough to represent a problem in satellite communications, but certain stars, especially Cas A, which is in the constellation Cassiopeia, are strong enough for use as measurement

sources for the larger satellite communications antennas.

Cas A has been extensively mapped, and a contour map, showing its brightness, is shown in Figure 3. Figure 3, Figure 1 and Table 1 are from National Bureau of Standards Report NBSIR 74-382 A Study of the Measurement of G/T Using Cassiopeia A by D.F. Wait, et. al.

Noise Fundamentals

Noise Power and Noise Power Spectral Density. Boltzmann's constant k relates temperature to the thermal energy of motion and matter. Its value is approximately 1.3805×10^{-23} Joules/K. The random acceleration of electrons in any type of matter produces electrical noise power, which is proportional to temperature in Kelvins.*

This power is uniformly distributed in frequency from zero through the microwave region of the spectrum. It has a **noise power spectral density**** defined by:

$$N = dP_N / df \bullet \text{ (Watts/Hertz)} \quad (1)$$

The Fourier components which describe the motion of electrons in matter begin to roll off in amplitude toward the millimeter-wave

*See Glossary. "Kelvins" is abbreviated to "K."

**The designation "spectral density" is in contrast to "flux density." The latter refers to noise power per square meter, which may be incident on an antenna, for ex-

ample. Noise flux density has the units of watts/meter² or watts/Hz/meter². In the discussions that follow, we will omit the modifiers "flux" and/or "spectral" except where the omission leads to ambiguity.

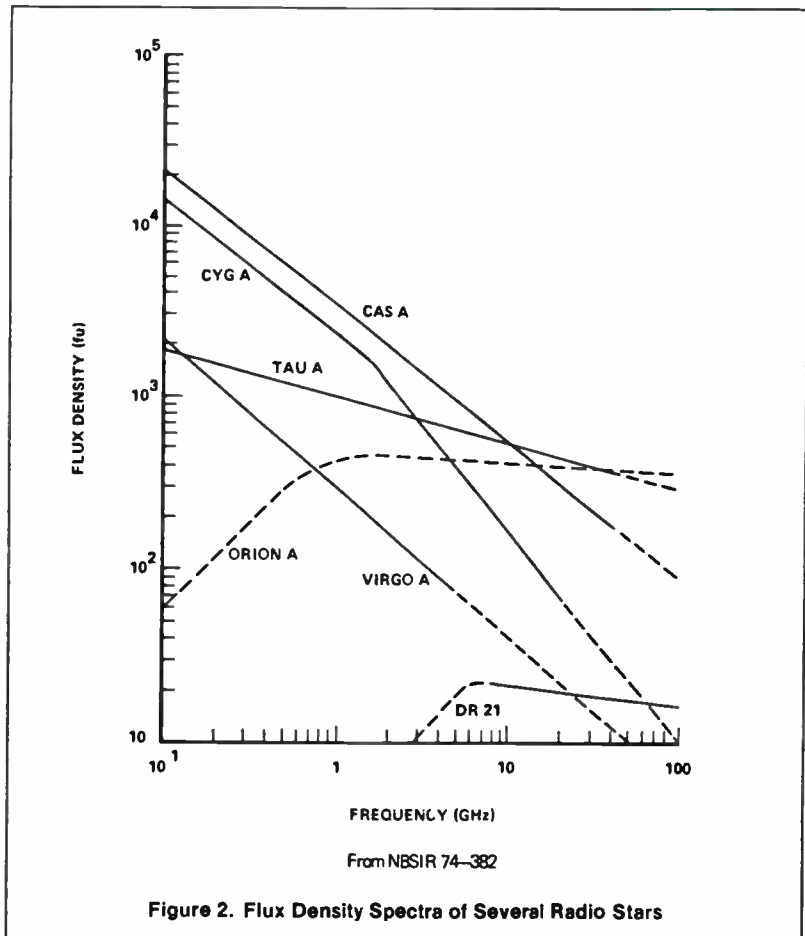


Figure 2. Flux Density Spectra of Several Radio Stars

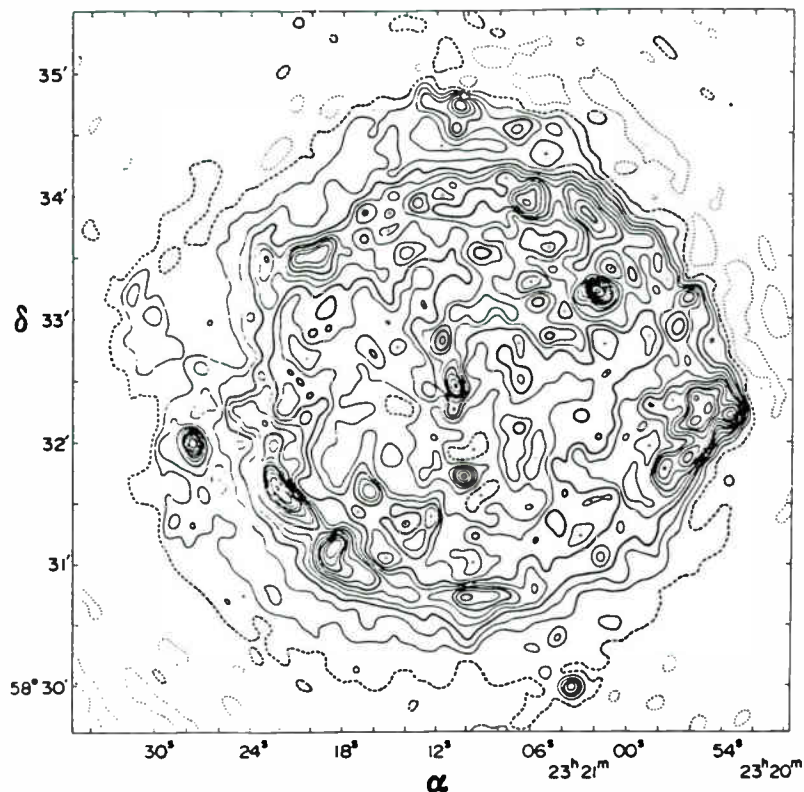


Figure 3. Brightness Temperature Contour Map of Cas A

(Coordinates for Epoch AD 1950.0, 5.0 GHz)

From NBSIR 74-382

(Courtesy of "Monthly Notices of the Royal Astronomical Society", Vol. 151, No. 1, p. 112, 1970)

power density on the assumption that we are considering only conjugately-matched devices.

Noise Temperature. The noise temperature T_x is a measure of the noise power produced by a communications system, subsystem, component, or noise source which is designated by the subscript x; it is always an "effective" temperature rather than a physical temperature, since it is a measure of all of the noise, both thermal and non-thermal.

T_x is the ratio of the available noise-power density to Boltzmann's constant:

$$T_x = \frac{N_o}{k} \quad (\text{K}) \quad (3)$$

It is a convenient measure because it falls in the range of a few degrees to a few thousand degrees in satellite communications circuits.

Noise Sources. A noise source is a device which generates a continuous spectrum of electromagnetic energy. A **standard** noise source is a noise source whose output noise-power density or noise temperature has been calibrated to a specified accuracy.

Most standard noise sources used in noise measurements of satellite earth station receiving systems fall into one of the following categories:

- a. Passive loads in waveguide or coaxial cable cooled to the boiling point of a specific liquified gas, such as Helium, Nitrogen or Freon.
- b. Passive loads heated to an accurately controlled temperature above the ambient.
- c. Noise sources obtained by electrical discharge in rarefied gases,

region of the spectrum. Quantum noise, caused by random changes of energy states of electrons, increases with frequency and begins to dominate above this frequency region.

The available noise power density N_o is that noise-power density delivered from a noise source to a conjugate load. It is given by:

$$N_o = kT \quad (\text{Watts/Hertz}) \quad (2)$$

We will tend to omit the modifier "available" in this paper and define noise power density to be synonymous with available noise



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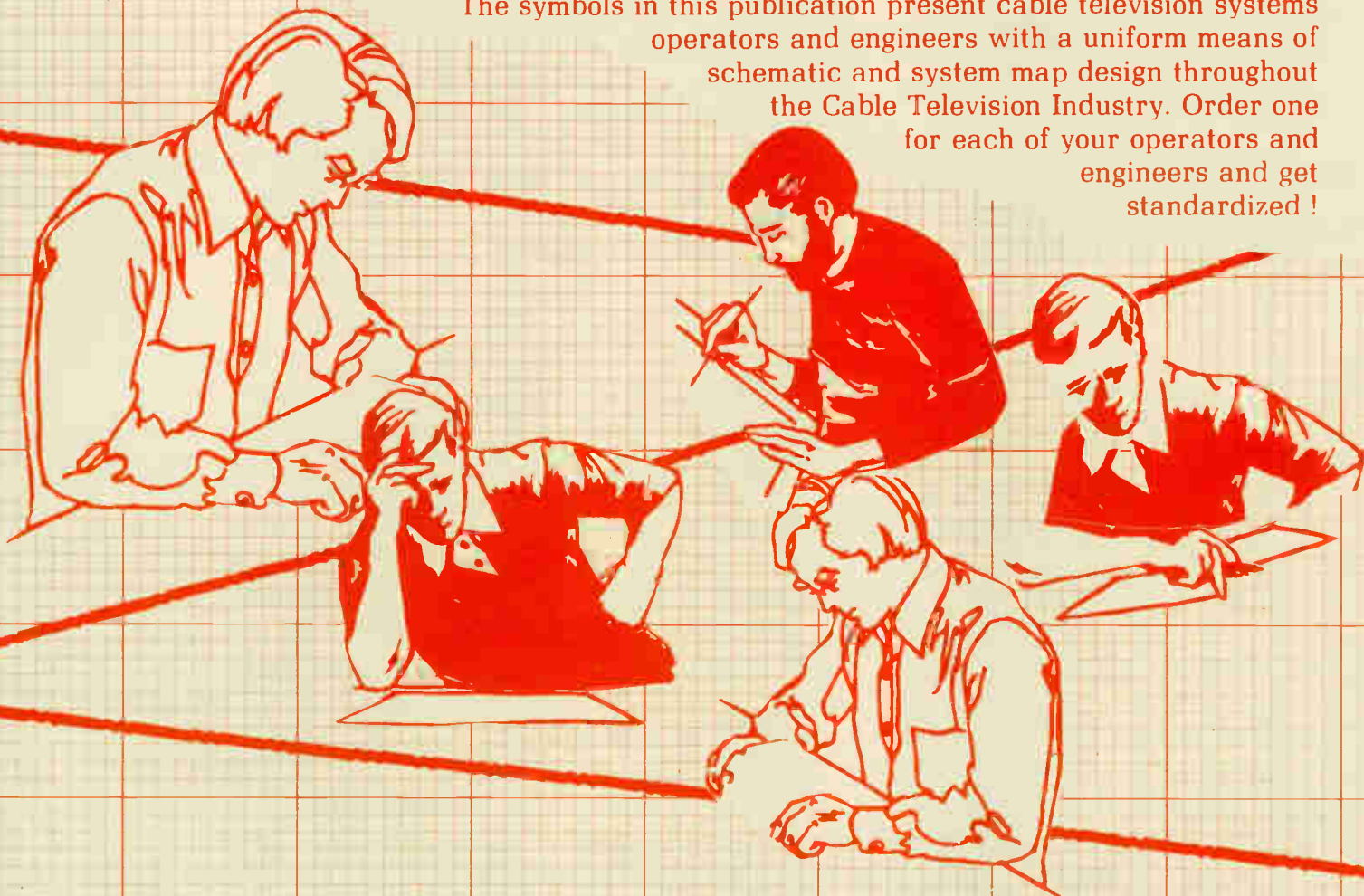
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- such as argon, neon or xenon.
- d. Solid-state noise sources.
- e. Receiving antennas. An antenna is a noise source which derives its noise power largely from the noise flux which is incident upon it.

Antenna Noise Temperature.

An antenna was defined in (e) above as a noise source. A typical antenna used in satellite communications can be considered a noise source combined with a nearly lossless, linear two-port* as shown in Figure 4, where the two-port represents the ohmic losses of the antenna. In the following development, we will consider these losses to be zero. The effects of losses will be taken into account by the techniques described under the section entitled System Noise Temperature.

It can be shown that if a lossless antenna is enclosed in a perfectly absorbing box whose temperature is T, the antenna appears at its terminals to be a noise source of temperature $T_A = T$. It "sees" a temperature of T from all directions.

If the box is removed, the antenna will see different values of incident noise flux, represented by different noise temperatures, as a function of direction about the antenna. The value of T_A is the **antenna noise temperature** of the antenna in a particular environment.

The contribution of the incident noise flux to T_A is weighted by the radiation pattern of the antenna. The total antenna temperature can be approximated by the equation:

$$T_a = \int_{\Omega_1} G_1 [T_C G_{\tau} + (1 - G_{\tau}) T_{\tau}] \frac{d\Omega_1}{4\pi} + \int_{\Omega_2} G_2 [p T_C + (1 - p) T_G] \frac{d\Omega_2}{4\pi} + T_s \quad (4)$$

where:

- T_a = antenna temperature,
- G_1 = the gain of the antenna as a function of the directions from which the antenna is receiving direct radiation from the sky,
- G_2 = the gain of the antenna as a function of the directions from which the antenna is receiving direct radiation from the earth,
- Ω_1 = the region of solid angle of the antenna pattern that is above ground level (steradians),
- Ω_2 = the region of solid angle of the antenna pattern that is toward the earth (steradians),
- T_C = the background noise temperature of the sky,
- T_{τ} = the equivalent atmospheric noise temperature,
- T_G = noise temperature of the ground (approximately 290K).
- T_s = noise temperature of the sun*
- G_{τ} = the atmospheric transmission factor (<1) through the troposphere and lower atmosphere including the effects of mois-

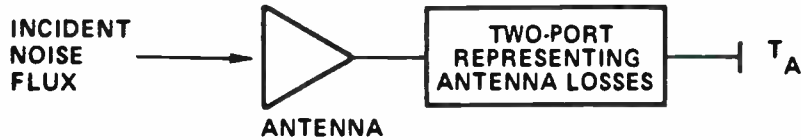


Figure 4. Antenna, Showing Incident Noise Flux

ture, and

ρ = the power reflection coefficient of the earth (<1). □

*See Glossary (Section 5C-1) and paragraph on power gain in this paper.

(Continued next issue with part 2)

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Showcase

LOW COST CRIMP TOOL FROM RMS

RMS ELECTRONICS, INC., introduces a heavy duty, low cost Hex Crimp Tool, Model #CA-596T. This Hex Crimp Tool is designed for the CATV and MATV installer, and insures positive crimp alignment and trouble-free installations. The CA-596T measures 2 1/4" x 9 1/4", providing greater compression leverage. Some of the features of this tool are: Hardened pins, lock rings, red molded plastic handles, lightweight and fits the installers belt, and it can be used with one hand. The hex dimension for the RG59/U is .262" and the RG6/U is .324" on a flat-to-flat measurement. RMS is offering this Hex Crimp Tool at a special Introductory Price of \$6.95.

For further information, or for placing orders, please contact RMS at the Bronx address: 50 Antin Place, Bronx, N.Y. 10462, or call 1-800-223-8312. •

SCIENTIFIC-ATLANTA INTRODUCES UL LISTED DROP CABLE

Scientific-Atlanta, Inc., has introduced UL listed, flame retardant bonded drop cable. The new cable is designed for use in applications which must meet NEC Article 820 wiring codes.

Manufactured in a wide range of sizes and configurations, the new coaxial cable is recommended for installation in SMATV, data network, video security and CATV system applications. The UL listed cable will be manufactured at Scientific-Atlanta's cable facility in Phoenix, Arizona.

For additional information contact: Richard Bell, Marketing Manager, Coaxial Cable Division (602) 268-8744. •

BEN HUGHES ADDS CRIMP TOOLS

Ben Hughes Communications Products Co., Inc. announces the addition of four CABLE-PREP® hex crimp tools. The HCT-325, HCT-340 and HCT-775 expand the RF connector application series of crimp tools.

MODEL NO.	Major Hex	Minor Hex	Contact Hexes		List Price
HCT-325	.400	.240	.100	.050	\$31.50
HCT-340	.149		.075	.039	49.50
HCT-669	.384	.324	.262		35.00
HCT-775	.384	.324	.100	.068	31.50

The HCT-325 crimps UHF connectors on RG-8 and RG-58. This tool combines four hexes on a new larger jaw. The suggested list price is \$31.50.

The HCT-340 crimps BNC connectors on RG-174, RG-179, RG-

187 and RG-188. The suggested list price is \$49.50.

The HCT-775 will crimp Gilbert N connectors for RG-58, RG-59 and RG-6. The suggested list price is \$31.50.

The fourth crimp tool, the HCT-669, is a combination tool, on the new larger jaw, of our HCT-659 and HCT-660 for CATV, MATV and STV applications. The suggested list price is \$35.00.

These tools are available from your CABLE-PREP® distributor. For more information contact Ben Hughes Communication Products Co., Inc., 304 Boston Post Rd., Old Saybrook CT 06475, (203) 388-3559. •

DIGITAL MULTIMETER FEATURING RIGHT ANGLE LEADS FROM CWY



Model
CWY-550

A new digital multimeter featuring right angle leads that help prevent breakage is now available to the cable television industries exclusively from CWY Electronics, Lafayette, IN.

The new Model CWY-550 six-

function auto range digital multimeter solves the problems of lead breakage and disconnection by incorporating leads designed at right angles.

The Model CWY-550 offers full auto ranging for quick and easy ▶

readings and employs Soar 80 pin LSI for low parts count and assurance of long-term stability and accuracy.

Also, the Model CWY-550 includes a continuity beeper and 100 megohm input resistance on 200 mV DC range for virtually no circuit loading of low output devices, with standard 10 megohm

on all other ranges.

Other features include auto polarity and decimal with full function annunciators; low battery indicator; and a replaceable fuse. The Model CWY-550 offers full overload protection for all functions and can withstand up to 6,000V surges.

The Model CWY-550 comes in a

rugged ABS plastic case with an LCD protective lens and RFI/EMI shielding. It can run for more than 500 hours on two 1.5V AA batteries, which are included, along with test leads and spare fuse.

For further information about the Model CWY-550, contact CWY Electronics, P.O. Box 489, Lafayette, IN 47903, or call toll-free 1-800-382-7526. •

ANIXTER COMMUNICATIONS TO DISTRIBUTE NIT TELE-IMAGER 2000

Anixter Communications will distribute Northern Information Technology's Tele-Imager 2000, it was announced by Matt Plonsky, V.P. of Sales and Marketing.

The product is designed to transmit freeze-frame video images across telephone circuits, twisted pair, or voice grade radio channels. The TI-2000 can capture video frames from any standard monochrome or color video camera or video tape recorder. These captured images may be saved and played back on any standard audio tape recorder, or processed via a thermal printer.

The Tele-Imager 2000 offers immediate picture communication, and will find application in any work that requires visual confirmation between remote locations, such as medical diagnosis (e.g. radiology), teleconferencing, identification verification, information display, electronic media and security.



NIT TELE-IMAGER 2000

The NIT Tele-Imager 2000 will be available throughout Anixter's Nationwide network of computer-linked distribution centers.

Northern Information Technology, located in Arlington Heights, Illinois, is a supplier of tele-imaging equipment, and is a joint ven-

ture with Ameritech Development Corporation, Inc.

Anixter Communications is a supply specialist to the telecommunications and Cable TV industries, and is a unit of Anixter Bros., Inc. For more information, contact them at (312) 677-2600. •

ANIXTER ADDS MODULATORS TO CATEL LINE

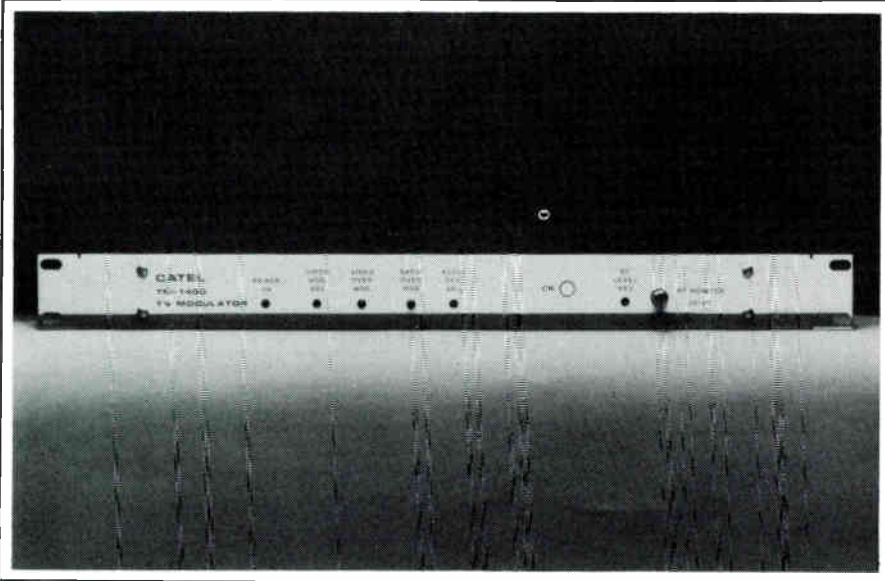
Anixter Communications has added the TM-1400 and TM-2400 modulators to its Catel product

line, it was announced by Gordon Halverson, Vice President of CATV Sales and Marketing.

The TM-1400 offers MATV, SMATV and DBS operators the advantage of a heterodyne modulator. Applications include TVRO, Camera, VTR modulator or any

use where baseband video and audio is to be converted to standard or special TV channels. The TM-2400 brings the advantages of IF modulation within reach of almost any CATV and CCTV ▶

Showcase



system. It can be used with film chains, cameras, VTRs or TV demodulators.

The Catel TM-1400 and TM-2400 are both available throughout Anixter's North American network of computer-linked distribution centers.

Anixter Communications is a supply specialist to the cable TV and telephone industries, and is a unit of Anixter Bros., Inc. For more information, contact them at (312) 677-2600 or write 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076. •

TM-1400 Modulator

TECHNICAL SEMINAR TO BE HELD IN IOWA CITY

The Annual Spring Iowa Technical Seminar will be held in Iowa City, Iowa, April 12 and 13, 1985. Papers will be presented on a variety of different subjects of current interest to cable personnel, from satellite transmission through installation practices.

This seminar, as with past seminars, will be led by vendor engineering representatives and by system engineers.

Attendance is not restricted to members of particular organizations. Systemtechs from neighboring states have attended prior sessions. The anticipated attendance is approximately 75 persons.

Pre-registration is \$15.00 which includes two meals.

For further information, contact Jean Hamilton, **Heritage Communications 515-246-1440.** •

BROADBAND DUAL CABLE LAN AMPLIFIERS INTRODUCED BY C-COR

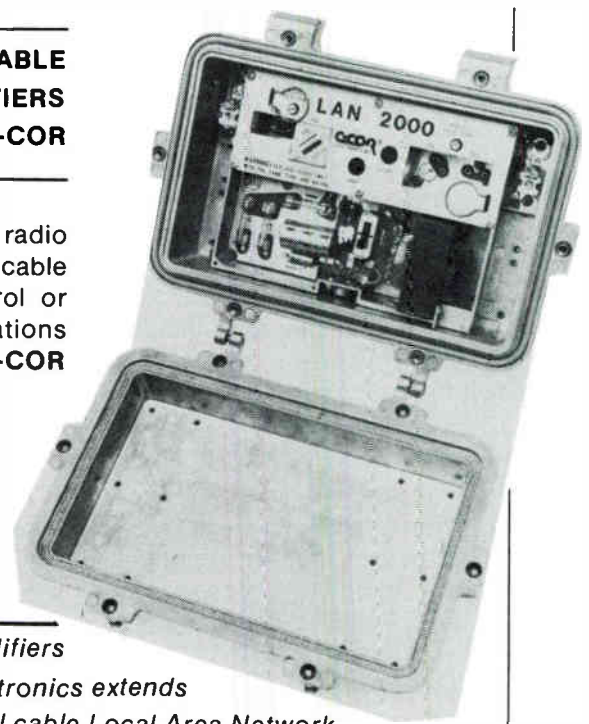
A new series of broadband radio frequency amplifiers for dual cable data systems, traffic control or video surveillance applications has been introduced by **C-COR Electronics, Inc.**

LAN-2000

LAN 2000 Series amplifiers introduced by C-COR Electronics extends tapped feeder lines in a dual cable Local Area Network.

The dual cable LAN 2000/3000/4000 Series amplifiers have a pass band of 42 to 450 MHz and a maximum operational spacing of 21 dB at 400 MHz.

The Model LAN 3000 Series amplifier is designed for the out-bound or receive cable of a dual



cable system, while the Model LAN 4000 Series is configured for the inbound or transmit cable. The LAN Series can also be used by itself in inbound single cable systems where larger amounts of inbound bandwidth are required, such as in traffic control and video ▶

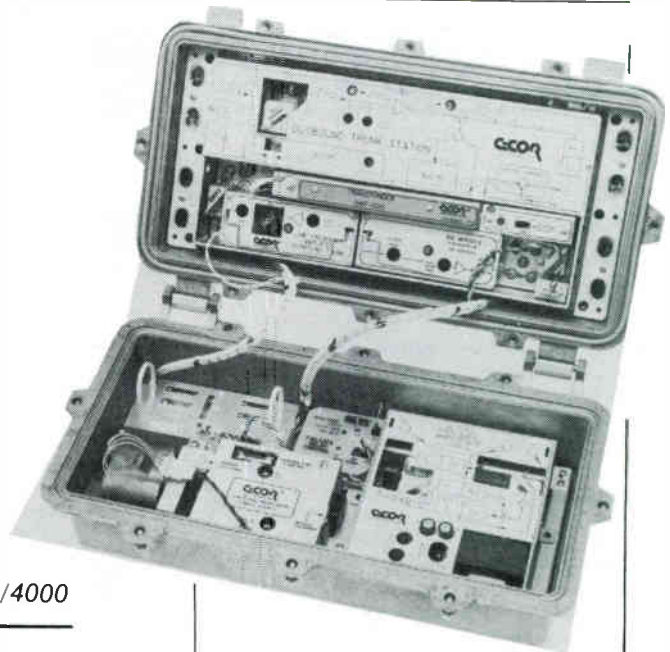
surveillance systems.

The LAN 2000 Series amplifier extends tapped feeder lines in a dual cable system and can be optimally configured for both inbound and outbound amplifier applications.

These amplifiers are housed in weatherproof and rfi-shielded aluminum housings suitable for outdoor or indoor installation. External test points on the housings allow monitoring of the amplifier without opening the housing cover.

Options available for the LAN 3000/4000 Series include status monitoring and an Active Failsafe Amplifier.

For more information, contact C-COR Electronics, Inc., 60 Decibel Road, State College, PA 16801. Phone 1-800-233-2267.



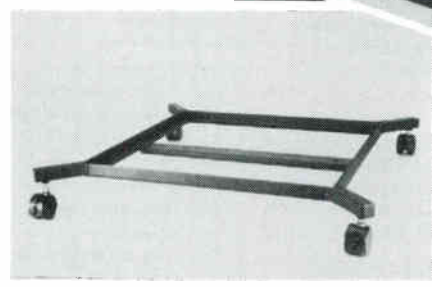
LAN 3000/4000

C-COR Electronics new LAN 3000/4000 Series broadband amplifiers are for use in dual cable data systems, traffic control or video surveillance applications.

RR/RB ROLL BASE AND DIGITAL STORAGE OSCILLOSCOPE NOW AVAILABLE FROM CWY

The new Model RR/RB roll base, introduced by CWY Electronics, provides a convenient and easy method of relocating headend racks. The roll base, designed to accommodate the CWY Model RR72 rack, is shipped assembled and comes complete with locking casters and outrigger-style supports, and is support weight rated at 500 pounds. The RR72 rack bolts tightly to the roll base for added security. Dimensions of the roll base are: 2 1/2" high, exterior 26 1/4" by 27", interior 20" by 20 3/4" and shipping weight is 12 pounds.

A compact dual trace LCD digital storage oscilloscope is also now available from CWY Electronics. The Model 1000 dual trace LCD digital storage oscilloscope



fits easily into a briefcase for easy transportation and on-site analysis and is ideal for field service, design engineering, and plant maintenance. Its battery operated memory allows remote data analysis. The



Oscilloscope

RR/RB

Model 1000 sells for \$1,195.

For further information, contact CWY Electronics, P.O. Box 4519, Lafayette, IN 47903, or call toll-free 1-800-428-5796. (In Indiana call 1-800-382-7526

Associate Roster

Note: Associates listed with * are Charter Members.

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Bellingham, WA 98225
206-671-7703
(M9, Standby Power
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Skokie, IL 60076
312-677-2600
(D1)

**Arts & Entertainment
Network**
555 Fifth Avenue
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212-661-4500
(S9)

The Associated Press
50 Rockefeller Plaza,
New York, NY 10020
212-621-1513
(S9 Automated News
SVC)

Automation Techniques,
1550 N. 105th E. Ave.
Tulsa, OK 74116
918-836-2584
(M9)

Av-Tek, Inc., Inc.,
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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.**
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1-800-327-6690
(D9, M4, S9)

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Tulsa, OK 74115
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(D9, Security &
Identification Devices)

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Santa Clara, CA 95054
408-988-7722

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

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CBN Center
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(S9)

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AMCOM, Inc.,
Bldg. E, Suite 200,
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Atlanta, GA 30342
404-256-0228
(S9, Brokering &
Consulting)

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

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1-800-428-7596
(M9, D1)

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Clovis, CA 93612
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Generators)

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1-800-336-9681
(M8, 9, S8, 9)

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Burbank, CA 91521
213-840-5080
(S4)

Ditch Witch,
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1-800-654-6481
(M9)

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1-800-526-4100 or
1-800-227-0700 (West)
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M5, 6, 7, 8, 9 Plastics)

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

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H1Z 2W4
514-725-2471
(M4, 5, 7, 9, D7, 9)

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

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

**Gardiner Communications
Corp.,**
3506 Security St.,
Garland, TX 75042
214-348-4747
(M9, TVRO Packages, S1
2, 8)

Gilbert Engineering Co.,
P.O. Box 23189,
Phoenix, AZ 85063
1-800-528-5567 or
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41 Harbor Plaza Dr.,
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Stamford, CT 06904
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Englewood, CO 80111
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Dallas, TX 75251
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Inc.,**
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D4—CATV amplifiers	M4—CATV amplifiers	S4—CATV software
D5—CATV passives	M5—CATV passives	S5—CATV billing services
D6—CATV hardware	M6—CATV hardware	S6—CATV publishing
D7—CATV connectors	M7—CATV connectors	S7—CATV drop installation
D8—CATV test equipment	M8—CATV test equipment	S8—CATV engineering
D9—Other	M9—Other	S9—Other

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Horseheads, NY 14845
607—739-3844
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Denton, TX 76201
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(M9 Standby Power)

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(S9, Programming)

Lindsay America, Inc.
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Panama City, FL 32405
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**MA/COM Cable Home
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(M2, 3, 7, S2)

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

**McCullough Satellite
Equipment,**
Route 5, Box 97,
Salem, AR 72576
501—895-3167
(M2, 9, D3, 4, 6, 7)

Microdyne Corporation,
471 Oak Road,
Ocala, FL 32672
904—687-4633
(M9 Satellite TV
Receivers)

* **Microwave Filter Co.,**
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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
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Atlanta, GA 30336
1-800—241-9996
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50 Antin Place
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1-800—221-8857 (Poleline)
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(S9)

**Telstar Marketing &
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C.T.H."F" 2930
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214—438-7691
(M1, 4, 9 Converters)

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416—629-1111
Telex 06-960-456
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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
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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)

Viewstar, Inc.,
705 Progress Ave.,
Unit 53,
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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.**
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Madison, WI 53701
608—257-1491
(S9)

**Warner Amex Satellite
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212—944-4250
(S4)

* **Wavetek Indiana**
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TWIX 810—341-3226
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Olney, TX 76374
817—564-5688
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(M1, 6) □

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OPPORTUNITIES

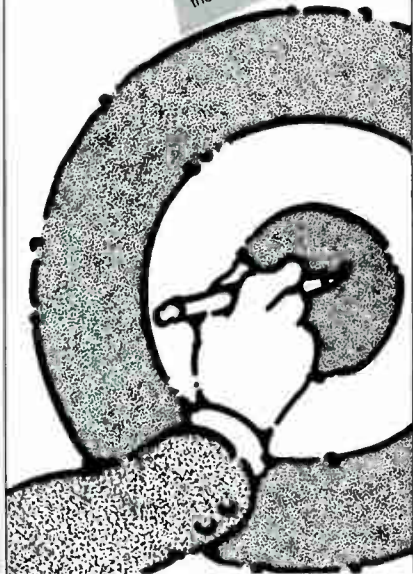
EXPERIENCED SYSTEM MANAGER WANTS TO RELOCATE

Single System manager wishes to relocate in the Southwest (preferably Colorado); experienced with all types of equipment and supervisory responsibilities. References available. Contact CATJ, Box 3875, 4209 N.W. 23rd, Oklahoma City, OK 73107.

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CATJ Classified advertising is offered as a service by CATA for its membership.

Any member of CATA may advertise in the CATJ classified section FREE of CHARGE (limit of 50 words per issue - 3 issues per year.)

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- 2.) Associate Members—pay an annual fee.
- 3.) Individual Members—pay an annual fee.

NON MEMBERS may also use the Classified section at the rate of 50 cents per word with a minimum charge of \$20.00. Add \$2.00 for blind-box. Non-members should include full payment with the ad insertion.

Deadlines for all Classified Advertising is the 1st of the month for the following month's issue.

Address all Classified material to: CATJ, Suite 106, 4209 N.W. 23rd, Oklahoma City, Okla. 73107.