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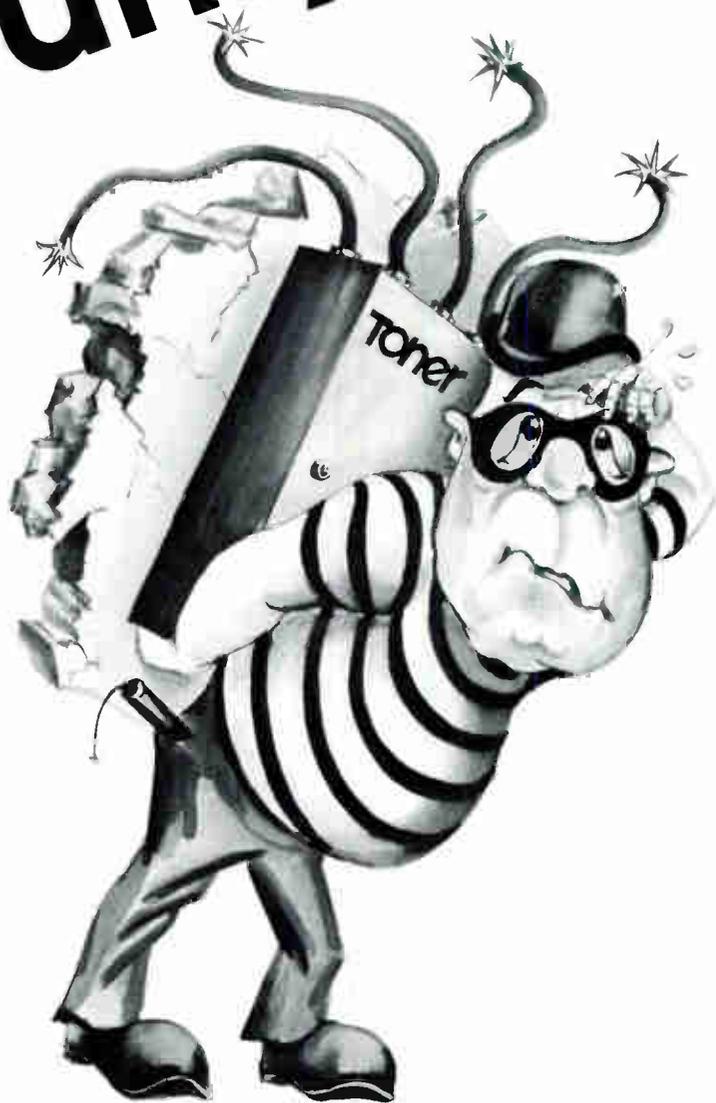
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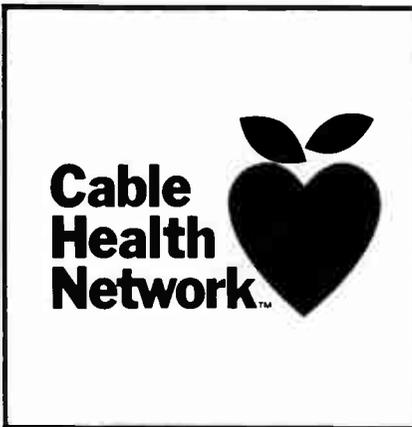
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CATJ, The Official Journal for the Community Antenna Television Association is published as a service for Association Members and other providing services to the industry.

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CATA — NOT JUST “SMALL” ANY MORE

At the start of a New Year, it is always a good idea to look back where you have been and look forward to where you want to go. That is the best way to get a sense of where you really are now. As President of the Community Antenna Television Association, I enjoy taking on this task for the Association because it is truly gratifying to see CATA's growth.

CATA started in turmoil. The independent cable television operators disagreed with the cable conglomerates over the issue of copyright. The “big boys” wanted to pay copyright fees as a way to eliminate restrictive federal rules that precluded building cable in the major urban markets. The non-urban operators did not want that compromise to be struck at their expense. Since the large conglomerates controlled the only cable television lobbying association at the time, the NCTA, there appeared to be no way to get the message across in Washington that there was more than one point of view on this issue. The only way to do it was to start another association. Thus, CATA was born.

For many years CATA has, therefore, been described as the Association representing the views of the “small” cable television operators as opposed to the “MSO's”, the Multiple System Operators. This, however, is not really true, and, as we look at the recent past of CATA, we can see that it is becoming less accurate all the time.

Most of the folks who started CATA were and are “MSO's”. That is, they owned more than one cable television system. Further, since its inception, CATA has had members not only in the “small” category, the 10 to 3500 subscriber group, but also larger members, with up to 20,000+ subscriber systems, and medium-sized MSO's with 100,000 subscribers on average. This trend has accelerated dramatically in the last year.

Where have we been? We have been in the trenches representing the interests of independent cable television operators. Now what does that mean? Well, it means that our **one and only** focus is on cable television system operation. We support the folks who operate the systems. It may be that they have other interests as well, but, when they support CATA, they know that the interest that we will represent, and the **ONLY** interest that we will represent, is their **CABLE** interest.

This, I believe, is the major distinction between the NCTA and CATA today. The NCTA represents, primarily, the very large media conglomerates with converging and sometimes conflicting interests. It is a tough job, and I think the NCTA is doing a very fine job! But

the interests of the very large conglomerates who are primarily focusing on branching out into programming and providing a multiplicity of services in large urban areas is sometimes very different from the interests of the majority of cable television system operators on a system by system basis.

It is in recognition of that difference (**and it is not a “fight” — it is simply a difference**) that some of the largest “MSO's”, with millions of subscribers, are now becoming CATA Corporate members. They are supporting CATA for several reasons, not the least of which is that it is always better to have a chorus singing your song in Washington than a solo performance! It is healthy to get all sides of an issue aired, and it is politically more potent to argue for or against a particular action from a number of different perspectives than from just one.

There are other reasons that the CATA Corporate Member program is working. One is that most operators, whether huge conglomerates or just single systems, are facing similar problems at the local level. The largest MSO's are now saying that decentralization is important. That local management is the key, and it is vital that local managers keep in touch with what is going on in the industry and explain what is happening to their local decision makers. There is no better way to do that than to assure that each local manager gets a copy of CATA's monthly newsletter. It is written for the operators, not for the corporate Board rooms. In one case, CATA is now “drop-shipping” 450 copies of the “CATAcable” monthly to one Denver Corporate Office.

Does this all mean that CATA is changing, that we will no longer provide the services to the “smaller” operators that we have in the past? No, of course not. CATA has always prided itself on being able to help cable operators help themselves. We taught our members how to file their own applications at the FCC rather than waste money on “hired guns” in Washington. We keep the telephone lines open for any operator to ask a question and get a quick answer on a legal or technical matter without getting a big bill for the answer. And we will continue to do that. But it is becoming clear that in the future we must represent a broader spectrum of cable operators. We **do not only** represent the “small” or the “rural” operators. They are a very important segment of our membership, and we are proud to say that there will probably **never** be a bill or a regulation written in Washington again without special provisions for the “small, rural” operators —

Two input cables for the TDR should be fabricated for testing at the taps or amplifiers. For the signatures shown in the following graphs, a universal type connector was fabricated using two alligator clips. This cable easily connects the TDR to any type circuit; however, due to a large mismatch in the connection, the display shows the following: (See Graph A) (See Figure 3).

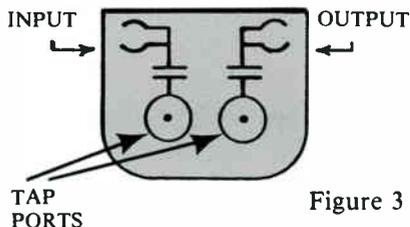


Figure 3

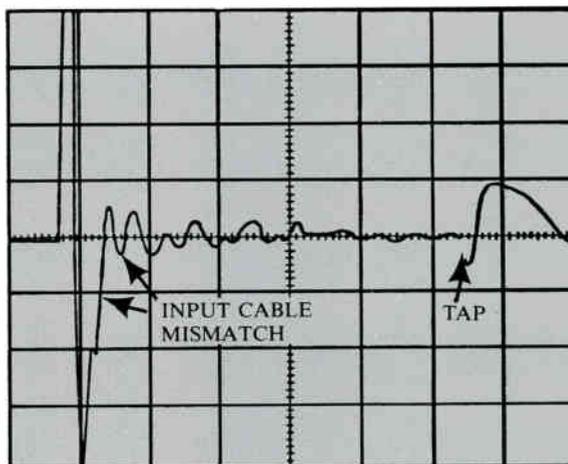
A better connection was fabricated using an RCA DT-2 two-way tap. All components between the tap port and the input/output terminals were removed except for one isolation capacitor.

This connector allows an easy connection by simply removing the tap plate and plugging in this modified connection. The impedance match is excellent and the display shows the following: (See Graph B).

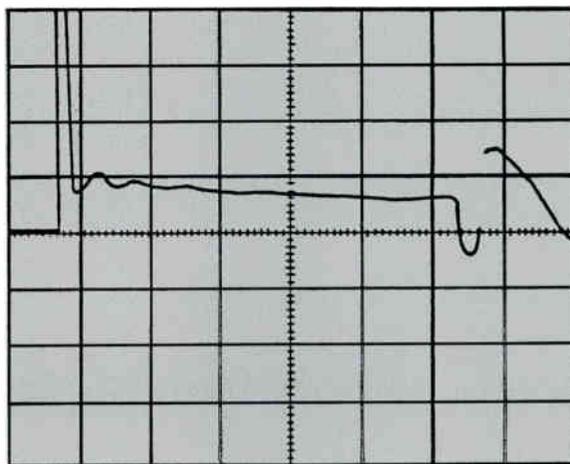
After this test set-up is completed, the TDR should be adjusted for the proper cable dielectric and the impulse width set to 10nS. The operator should then set the FEET/DIV to 50, and adjust the controls so that the complete test set-up is displayed. The signatures will all be on the first two or three gradicules of the scope. Next, the FEET/DIV control is turned until the three signatures are spaced across the screen. Experimentation with the return loss (dB) control may be necessary in order to obtain a signature that is easy to read.

The signatures shown in the following graphs were obtained using RCA passives and COMM/SCOPE '500' cable. Other brands of passives were substituted and the signatures were different, but still easy to recognize.

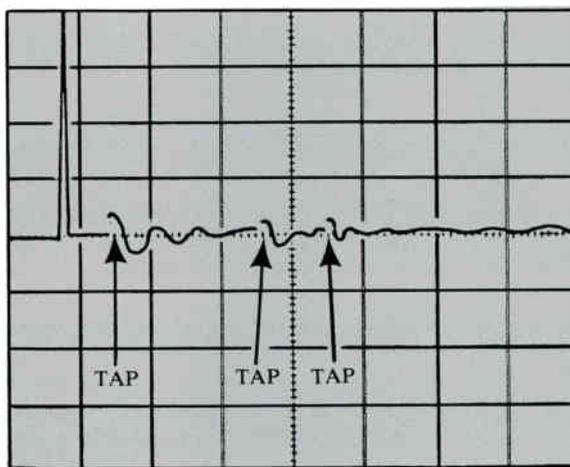
GRAPH A



GRAPH B

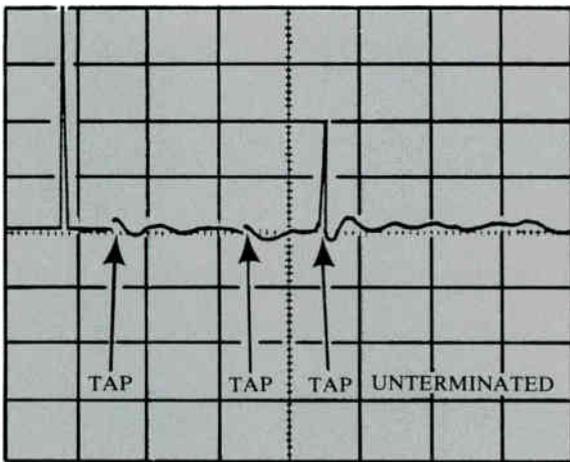


GRAPH C



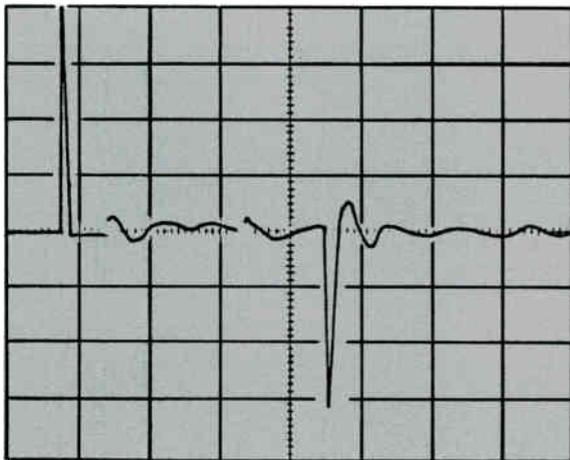
1. The leading edge of the first pulse is aligned with the first gradicule on the screen using the zero reference control. The signature of the three taps are easily recognized as phase changes on the display. (See Graph C).

continued



GRAPH D

2. The 750HM terminator was removed from the last tap. The impedance increased as shown by the positive direction of the display. An open tap will show a similar display. (See Graph D).



GRAPH E

3. The last tap was shorted on the input. The impedance decreased to zero as shown by the negative direction of the display. Water in the tap will show a similar display; however, the size of the display will depend on the amount of impedance change caused by the water. (See Graph E).

The first tap in the series was replaced with a terminated RCA SP-2 splitter. Figure 4 illustrates the new test set-up.

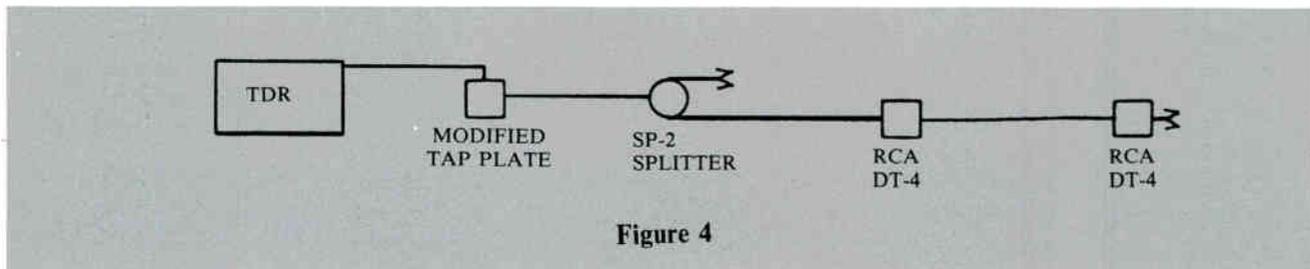
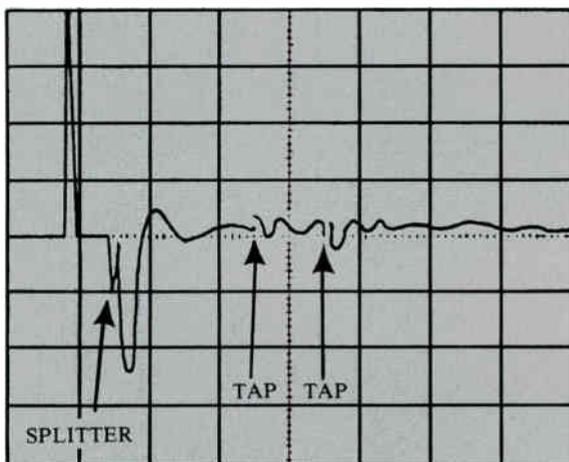


Figure 4



GRAPH F

1. The signature of the splitter is distinctly different from the tap signature. An accurate measurement cannot be made through a splitter or directional coupler due to the two sets of returns coming from each leg back to the TDR. (See Graph F).

2. If the splitter is unterminated or one side is open, the display shows a high impedance on the input of the splitter. With this condition, the taps on the other leg of the splitter can be viewed. (See Graph G).

The test set-up shown in Figure 5 allows testing up to the line extender amplifier. All power must be removed from the circuit before connecting the TDR. Removal of a tap plate in the feeder line will break the line AC on the RCA system used for the test. This will enable the operator to view the system to the next amplifier only.

GRAPH G

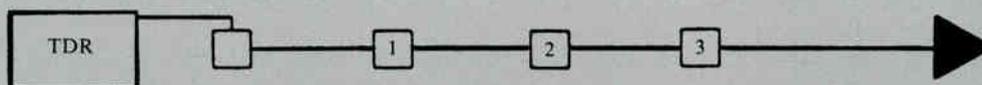
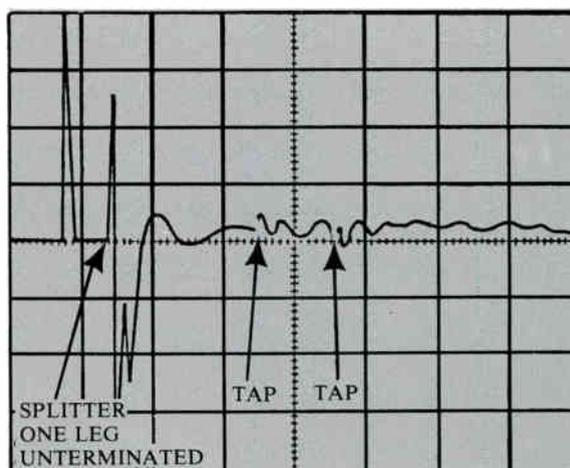


Figure 5

1. The line extender amplifier with the power removed shows a high impedance on the input. Any readings past this part of the display are not taps beyond the amplifier, but are reflections or repeats of the preceding taps. (See Graph H).

The strip recording below was made at the output of the last line extender in a feeder line. The line was twelve RCA taps to the end of the line with the last tap properly terminated. The last tap was 1450 feet from the line extender. The cable lengths between each tap was

GRAPH H

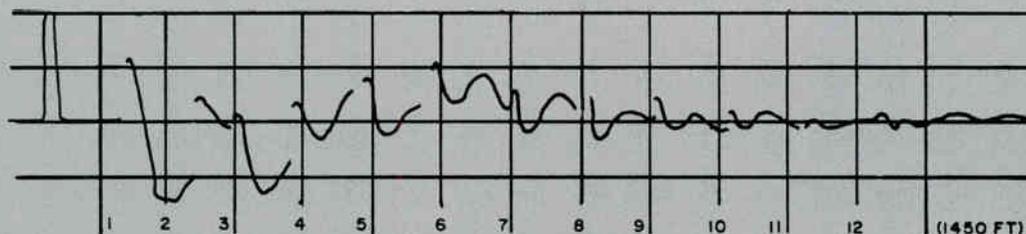
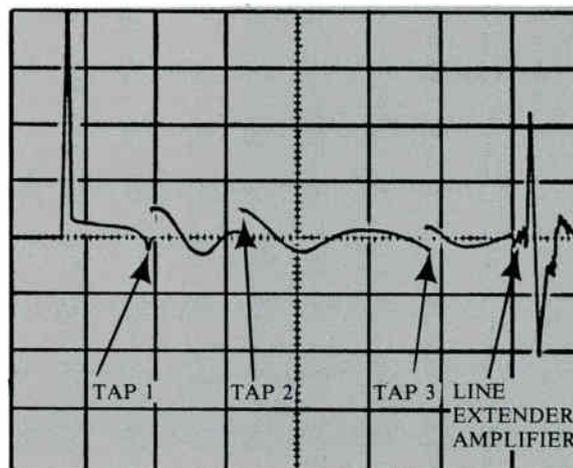


Figure 6

measured with the TDR and recorder. When measuring, the TDR shows the distance from the TDR to the measured point. To find the distance between taps, the preceding tap distance can be subtracted from the measured distance of the next tap.

Using this one test point, the operator can determine the distance between taps, and the full length of the cable run, and can locate open, shorted, or unterminated taps as well as damaged cable.

The ability to recognize the dif-

ferent signatures caused by the passives used in a system will enable the technicians to use the TDR to measure and troubleshoot the system. This ability is easily gained by using a test set-up to identify the signatures of each type of passive used in an individual system. □

Not Just Another Article About

CABLE LEAKAGE

BY: Chris Papas
FM/TV/CATV Specialist
Federal Communications Commission

Recently there have been many articles written about Cable Signal Leakage problems. These articles describe everything from drop cable deterioration over a period of time, to how many loose F connectors could be found on any given street. CATJ also printed an excellent article concerning the Signal Leakage problem in their June issue, but unfortunately all this advice has not been taken seriously until the threat of the FCC's impending inspection or performance measurements has become "official" and then becomes a reality. This has been the sad state of affairs for some cable companies so far.

Many cable systems have made an honest effort to **CONTROL** their signal leakage problems; notice I used the word control. In real life no system can be perfectly tight twenty four hours a day, seven days a week. There are just too many unforeseen factors that can take a system by surprise. All too often though, signal leakage problems are caused by improper installation and maintenance of a system. The FCC would like nothing better than to get out of the cable enforcement business. However, too many systems are not taking the **FCC Rules** or **Signal Leakage Monitoring** seriously, so business is booming! Signal Leakage Monitoring is just **one** of the FCC Rules. This monitoring can also be a help to a system, especially those that are carrying frequencies that are also used in the aeronautical, marine, or public safety services. Many system problems that

directly affect the customers picture quality can be cured by locating and fixing a known source of leakage on the cable. Regular leakage patrols are the best form of preventive maintenance on a cable system. Without proper maintenance, old systems get older and new systems deteriorate. Then, angry subscribers write letters to the FCC, and let's face it friends, most system operators would rather deal with these problems before the FCC is called in.

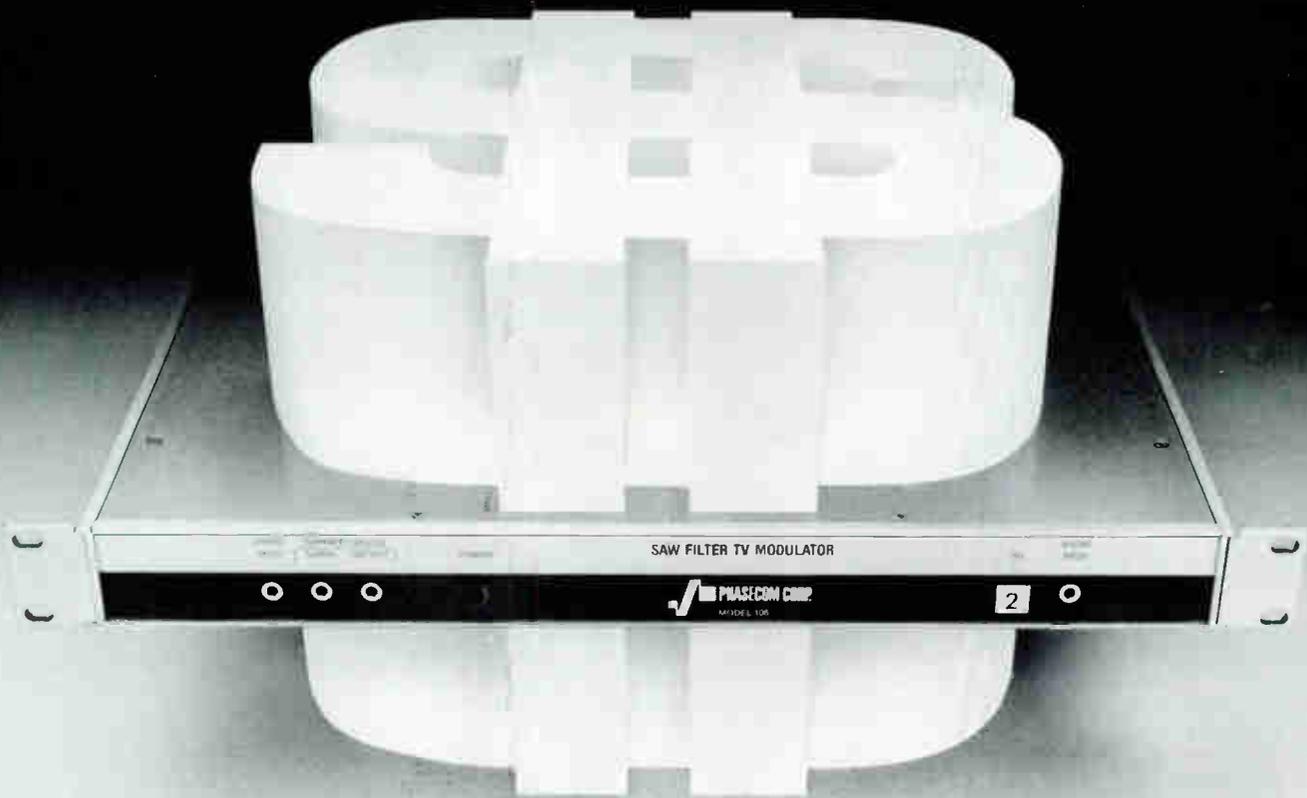
All of the FCC rules with regards to cable are located in **Volume XI, Part 76**. Since **all cable systems are required** to have a copy of these rules, naturally you have yours **right there on hand!!** The rules also state that you are expected to be familiar with them, so take a few minutes to read through every now and then. The rules for signal leakage are pretty much contained in 76.605(a) (12) which is the allowable signal leakage limits, 76.609(h) how to measure the signal leakage, 76.610 (d) regular leakage monitoring of the system if you are carrying any signals in the aeronautical bands, and 76.613 harmful interference due to signal leakage. The FCC is taking the time to look for leaks and is getting **tougher** on issuing forfeitures. The Field Operations Bureau has been given the authority to issue these forfeitures **immediately** after an inspection.

The methods used by the FCC to locate the leaks in the system vary from office to office depending upon available equipment. Some

use VHF receivers with dipoles, direction finding equipment, and cuckoo or sniffer systems, but **all** use calibrated field strength meters to measure the intensity of the leak. Leaks as high as 12,000 microvolts per meter have been found on a system. Incidentally, one leak was measured at 11,560 microvolts on cable channel E, which is not a good way to make points with the amateurs. If leaks are found in your system, a violation letter or a forfeiture letter will be issued by the inspector's office. You will then have to answer the letter to explain why the violation occurred, and what will be done to prevent such violations in the future. Violations or forfeiture letters **can** and **will** be issued for not making the regular leakage monitoring efforts that are required, if you are running any carriers in the aeronautical band.

Take the time to check your systems before we have to. We don't like to hear any customers, or pilots, or amateurs complain any more than you do, but **only you** can stop the problem! If you have any questions concerning the rules, contact any FCC Field office and they will be glad to help you in any way they can. **Let's work this problem together OK!**

NOTE: The views expressed in this article are those of the author and do not necessarily reflect the views or official position of the Federal Communications Commission. □



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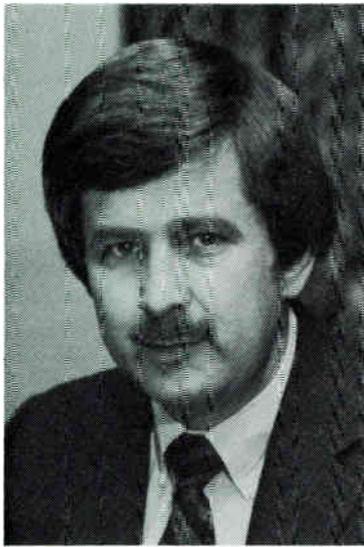
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Is There Room in the Technology Marketplace of Tomorrow for All of Today's Technology?

By: Dr. Ed Meek
Director of Public Relations
Marketing and Communications
Consultant
The University of Mississippi

With the advent of this new year of 1983, it is appropriate that a long look into the future be taken. What is in store for the cable operator in tomorrow's technology? Is the telecommunications industry prepared to accept the challenges of the future? The predictions leave one almost incredulous. Dr. Ed Meek, Director of Public Relations, Marketing and Communications Consultant, University of Mississippi, explores these predictions.

Some people wonder if there is room in the technology marketplace of tomorrow for all of today's technology.

I wonder not if there is room, but whether those of us in the telecommunications industry are prepared to take advantage of the greatest opportunity and marketing challenge of the century.

Cable, DBS, SMATV, TVROs, low power television, satellite radio, cellular radio, computers, teleconferencing, and fiber optics are just some of the emerging technologies which most futurists agree will change the face of societies throughout the world. The challenge to develop the equipment necessary for these technologies is being met, but the larger challenge that remains is for innovative business professionals to develop marketing and support programs that will successfully integrate these technologies into our lives, into business and industry, into education and other institutions throughout society.

Future predictions leave one almost disbelieving. Consider these thoughts:

- * Room-sized picture screens with 3-D pictures connected by interactive cable systems and linking satellites will one day interconnect the world's communities allowing colleges to bring into the home or the office courses which are team taught by professors from around the world.

- * Cable-based newspapers, programmed by the homeowner, which will provide summary text, in-depth audio and video, and print the paper at the breakfast table.

- * Computer-cable-satellite interconnects will allow shoppers to accomplish tasks without leaving the home or office with products ordered by the push of a button, shipped from distant points, and banking accomplished in a split second.

- * During the next five to ten years we will build and install more communications technology than presently exists.

- * Satellite farms, by the year 2000, could provide between 22,000 and 48,000 channels for television, voice and other communications.

- * Teleconferencing is expected to grow at a rate of between 20 and 40 percent during the next few years and can eliminate by the end of the decade most of the \$800 million now spent in executive travel time.

- * A fiber optic, one-fifth the size of a hair, can carry 10,000 telephone messages or 8,000 TV channels.

- * Some \$30 billion was spent on communications technology in the year 1980 and is expected to reach \$150 billion by 1990.

- * Computers which will fit inside a shoe box have more power today than room-sized computers a decade ago.

- * A new computer theory being developed at The University of Mississippi, could, during the coming decade, make it possible to build a "chip" cube the size of two human hairs that is capable of storing all of the world's knowledge.

- * Satellite and cable-based newspapers are a reality and some predict the dramatic decline in communications dependency on paper.

- * By the year 2,000, 67 percent of the American work force will be employed in education-information industries.

No segment of our lives will remain untouched by these and other

continued

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COMMUNITY ANTENNA TELEVISION JOURNAL

CBIC

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Diagnostic Wall Chart Instructions

This Diagnostic Wall Chart is designed to help you identify the cause of Citizens Band Interference (CBIC) on your television. It contains 12 photographs of typical CBIC problems, each with a description of the problem and a list of possible causes. The chart is intended for use by technicians and hobbyists alike.

Recognize the Problem. Virtually every form of television interference has a characteristic appearance. The off-air headend type problems are the most common. They are caused by a variety of factors, including poor reception, multipath interference, and signal-to-noise ratio. The chart provides a visual guide to these problems, helping you to identify the cause and take appropriate action.

Possible Video Distortions. This section shows examples of various video distortions, such as horizontal sync loss, vertical sync loss, and color distortion. Each example is accompanied by a brief description of the symptom and a list of potential causes.

Possible Transmission Distortions. This section shows examples of various transmission distortions, such as signal-to-noise ratio, multipath interference, and signal-to-signal ratio. Each example is accompanied by a brief description of the symptom and a list of potential causes.

FCC COMPLIANCE TESTS SUBJECTIVE EVALUATION SYSTEM WALL CHART

HEAD END SIGNAL QUALITY EVALUATION COMPARISON CHART

FM VIDEO TRANSMISSION WALL CHART

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

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

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drill adaptable

technological developments. Will DBS bring about the demise of cable? Will the networks (CBS, NBC, ABC) be changed by CNN and other networks? Will low power TV change commercial television? What will happen to advertising when a computer-connected television set of a home viewer contains 22,000 channels? These are some of the questions that must be answered. To venture a general answer, I believe there is plenty of room for all technological developments, and each will present many enriching opportunities for the sale of equipment and services. DBS will not "kill" cable. Neither DBS nor cable will "kill" the market for home satellite terminals. We will see dramatic changes in the mix of communications with less use of paper and more use of the airwaves. Satellites, satellite receivers and cable are the key elements that will make it all happen.

The greatest opportunities will come to those individuals who begin now to think in future terms. As an example, operators should consider the vast market available in SMATV (there are some 28 million apartments in this country, many yet unwired!), the market available in institutions such as hospitals, educational institutions, and the market among professionals such as bankers, lawyers, physicians and accountants. The connecting point for virtually all of the future technologies is the satellite receiving dish and cable.

Cable offers perhaps the greatest opportunity of the technology century. How much of this opportunity is realized depends on the ability of operators to conceive and seize the profit centers that exist today and which will emerge. Home security, emergency services, local advertising, utilization of data channels, and other applications which will meet the needs of the home owner as well as the businessman are in cable's early future. The cube

system in Columbus, Ohio, the growth of tele-text programming, profitable local advertising in systems from New York to California and systems which provide data inter-links for corporate offices in major markets are a glimpse of the future.

The dream of a Dick Tracy video watch, of pocket computers which will interconnect world audiences, of home antennas capable of receiving thousands of channels, of banking and other business services via satellite, of colleges and universities that are based in the home or in the work place, and of cable with hundreds of channels will become a reality. The only limit to these and other dreams is the vision of the application of these technologies held by those of us in the field. For those who dream ahead and begin today to expand the application of current technologies, the rewards will be great. The marketplace will leave behind those who fail to dream and refuse to expand the application of these technologies. □

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ONE MAN'S OPINION



by
Wayne Sheldon, Chairman
CATA Engineering Committee

I made a quick trip through the Western Show at Anaheim. The most obvious thing about it was the size. It was big and lavish. If you didn't stop to look at anything, it took about three hours at a dead run to go past all of it.

In the interests of CATA-CATJ, I looked at four new items that may be of interest to readers. Since these were show demonstrations, I did not get to twist the knobs, run performance tests or dig into the insides of the various items. I only looked at the set up demonstrations and talked to the sales people. After I mullied it over for a few days, I called some of the factories and asked them specific questions I didn't think of at the show. Therefore I can give only my impressions and opinions of these items. This is not a full engineering quality report.

The first item was TOCOM's add-on descrambler that can be used with existing converters.

The Model 5501A Addressable Baseband Decoder is designed to be compatible with any multi channel converter that has channel 2, 3 or 4 output. This makes the two pieces completely compatible with the TOCOM 55 Plus® addressable terminals and may be mixed with them. The idea here is to use your existing converters and avoid a considerable capital outlay. In quantities under 10,000, the 5504B complete terminal is priced from \$142 to \$177, depending on options, and the 5501A is \$64.75. The unit is only 1½ inches high and may either be

placed under an existing converter or mounted on the back of the set out of sight.

Signal security (theft of services) is probably the largest problem facing pay TV services of all types: cable, MDS, STV, etc. Estimates vary from a low of about 5% to a high of over 35% of people that are using the services are not paying for them. No matter what the actual figure is, it amounts to many millions of dollars in lost revenue to cable systems and program suppliers. Most of the people I talk to in the engineering end of the business seem to pooh-pooh the idea that there are people out there just making a business of defeating various security devices. They seem to think that each individual user must do his own tinkering. I guess if you don't



A



B



C

(A) Marilyn Talley and the HUGHES booth always seem to be popular with show visitors, and this was certainly a busy place during the show.

(B) SOUTHERN SATELLITE SYSTEMS provided some interesting information for the show attendees, bringing in samples of their programming.

(C) Marty Moran, TONER CABLE EQUIPMENT and COMPUTER COMPANY, is deep into a demonstration of their computer equipment.

admit that you have a problem, you won't have to solve it.

The TOCOM 55 Plus® system literature states: "Pay services can be controlled by channel or by program in 32 separate and independent service classes. Each service class may include any combination of the 32 flexible service classes. This replaces restrictive tiering concepts.

"Another powerful control mechanism is available with subscription programs which provide a type of pre-authorized pay-per-view. At any given time, the terminal's memory allows each subscriber to be remotely authorized to receive up to 4 individual pay-per-view and/or subscription programs. This feature can

be used to provide access to educational programs or to control access to special premium entertainment programs." Another feature of the units is a parental discretion control.

The method of operation is: starting with baseband video the addressing and control information is encoded onto lines 17 and 18 at the headend and transmitted along with

the scrambled video signals. At the receiving end the selected channel is demodulated, unscrambled and re-modulated onto channel 2, 3 or 4 for set use.

That's a lot of signal processing that, if it is not done extremely well, will seriously degrade the picture quality. The pictures on the show sets were good to excellent. I wonder if the units there were hand picked and if an entire production run will be as good. You see, I am naturally suspicious about this type of thing.

continued on page 20

By: Glyn Bostick
and David Sherman
Microwave Filter Co.



FILTER COOKBOOK

DESIGN EXAMPLE

We want to trap a carrier at 115 MHz (F_0). Nearest carrier in service is 108 MHz, so $BW = 10$ MHz would more than protect FM.

Following design procedure:

CAPACITANCE CALCULATION

CAPACITANCE	CALCULATION	USED
C_1	3.18	3.3
C_2	100 Pfd	68*

*Long leads on cap increases its effective value.

L_1 calculated .6 uH
Calculated turns 10
(used 8)

L_2 calculated .019 uH
Calculated turns 2.15
(used 2)

Figure 3 is a photo of the completed trap. Note that return loss is greater than 14 db, even near the notch.

NEXT TIME

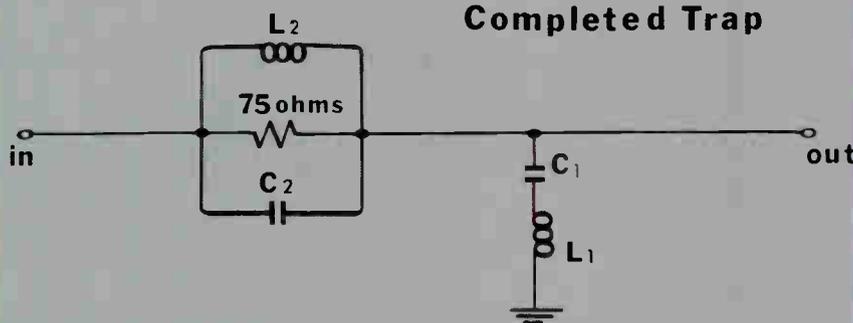
This concludes the CABLE TECH'S FILTER COOKBOOK series, at least for the time being. Next time, we return to the "HAPPY EARTH STATION" and discuss "external filtering" against Terrestrial Interference: Operations outside the TVRO to reduce reception of unwanted signals.

ACKNOWLEDGEMENTS

Many thanks to John Greatrex for line art, and David Skevel for photography.



FIGURE 3
Completed Trap



STANDARD CAPACITANCE VALUES

Primary standard values are:

1.0	2.7	5.0
1.2	3.0	5.6
1.5	3.3	6.8
1.8	3.9	7.5
2.2	4.7	8.2

MULTIPLY THESE
BY 10, 100, etc.
AND GET OTHER
STANDARD VALUES



A A segment for "ENTERTAINMENT TONIGHT" was taped from the floor of the Western Show from the above set.



B Another view of the exhibits outside the Convention Center.



C Steve Effros, Executive Director of CATA, participated in the program, on a panel, and is seen here visiting with Paul Maxwell, MULTI-CHANNEL NEWS.

continued from page 17

There are no easy solutions to the problem, but anytime the complete signal is taken into a home, the possibility of theft is there. The idea of getting something for nothing is very prevalent, and many of us will take it if the opportunity presents itself. All of the security systems which allow the complete signal into the home, that I have had experience with so far, only keep honest people honest.

According to TOCOM, their "baseband encoded scrambling technique provides outstanding security." I questioned them at the show and over the telephone about this. I was assured that it is nearly

impossible to defeat this system, (what else would you expect them to say?) but they were understandably reluctant to divulge much information about their process.

I did learn this: all signals are scrambled alike, only the authorization codes are different. The importance of this is that once you unscramble one signal, you have the key to all. I asked if there was one connection or set of connections that would turn the descrambler on for all channels. The question was evaded, rather than answered completely. Given the expertise of the pirate technicians in this part of the country, I give them between about 26 minutes and one day to gimmick

a stolen box so that it gets everything on the cable. The going rate around here is thirty bucks to "fix" your legal box so you get everything. All you have to do is pay for basic plus one service so you are supplied with the unit. If you have a stolen box, all you need pay for is basic. I hope TOCOM is right, but I have "great faith" in the thieves' ability.

Channel Master had two items.

The first was their Micro Beam® system. In this, all the signals on the cable, up to 52 channels, are connected into a microwave transmitter unit. This unit converts everything to the CARS band and it is then beamed to a receiver which may be up to 15 miles away, where the signal is down converted and placed back on a cable. There are many obvious uses for this. The complete transmitter and receiver are each in a housing, slightly longer than truck bridge housings and are mounted directly on the tower near the antenna.

In the past there have been several attempts to do this, but until now, all have ended in failure. Hughes' AML uses a different approach. The show demonstration was over only a distance of about 100 feet

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A

(A) A small view of some of the outside exhibits near the Anaheim Convention Center



B

(B) The BROADBAND ENGINEERING booth was combined with the LRC and VITEK booths to create an impressive accumulation of their respective products.

and only a few channels were used. The picture quality was so-so, but then the off the air pictures were not that great either.

The only way I could make any recommendations on this would be after running a full battery of tests on a fully loaded system. Even then I would want to test the long term stability under extreme environmental conditions. If the system is as good as they say it is, and they have solved some of the problems that bugged their predecessors, it has great potential.

Their second item was a computer control system combined with a unit they call Address-A-Trap™. The computer control system (they use an IBM personal computer system that can handle up to 6500 subscribers) seemed fairly straight forward. In conjunction with a special subscriber data controller, it is used to turn the various services at each subscriber on and off and at the same time feed the billing information into the main accounting computer.

The unique part of this system is the method used to secure the signals. The Address-A-Trap™ is a

special unit that is mounted outside the home on the strand or in a pedestal alongside the regular subscriber tap. Power is supplied from the home via the drop cable.

The Address-A-Trap™ is a micro-processor controlled addressable device that can be used to turn basic service off and on and to control up to ten levels of programming. Each level is from one to three channels wide. Hard audio and video security is provided on all unauthorized channels at the drop, eliminating the

continued

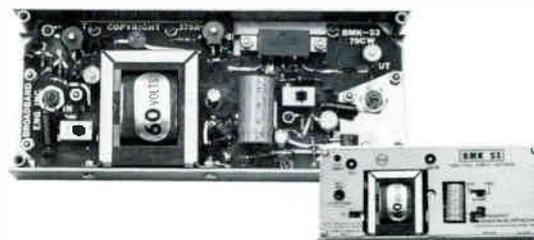
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A



C

need for other scrambling of premium channels. The unit places multiple jamming carriers over the entire band, 40 per channel. These carriers are inserted after the internal amplifier, therefore they cannot get back into the system. Only those carriers on authorized levels are turned off, leaving all the rest of the channels really messed up. I could see no signs of a picture when the carriers were on, and of course the pictures are the same as those off the cable when the jamming carriers were turned off.

Depending on the number of subscribers it handles, the subscriber data unit, which has a non volatile memory, updates each customer unit every minute or so. This makes a highly secure system and after a power outage service is promptly restored to all subscribers.

I did not get into the units to see how all this was done, but the approach makes a lot of sense. However, I can foresee a few potential problems.

Comb generators tend to splatter into undesired areas. Isolation between levels must be very good or interference will show up in desired channels.

There is no method provided for detecting a comb generator failure. If a generator fails, the subscriber will receive channels which should be blocked. Few people will call in to complain. I was told that in all other failure modes the subscriber



B

(A) Joe Carmona of THE ENTERTAINMENT CHANNEL organized another outstanding booth presentation on the Exhibit Floor.

(B) The Grand Ballroom was the scene of the SHOWTIME party with gaming tables, continuous music, and food stations of various kinds. It was great!!

(C) In celebrating their 10th anniversary, HBO threw a gala resplendent with outstanding food, dancing, and two stages which alternated music from the '50's and disco routines.

does not receive the proper service or unit is totally dead. This is no different from most other methods.

The extra carriers on the drop could increase signal leakage if a ground block or a TV set has problems. The carriers are about 15 db below the video carrier so if you run a "tight ship" this should be of no concern.

The housings I saw at the show did not appear to be weatherproof, but I was told this is not the final form.

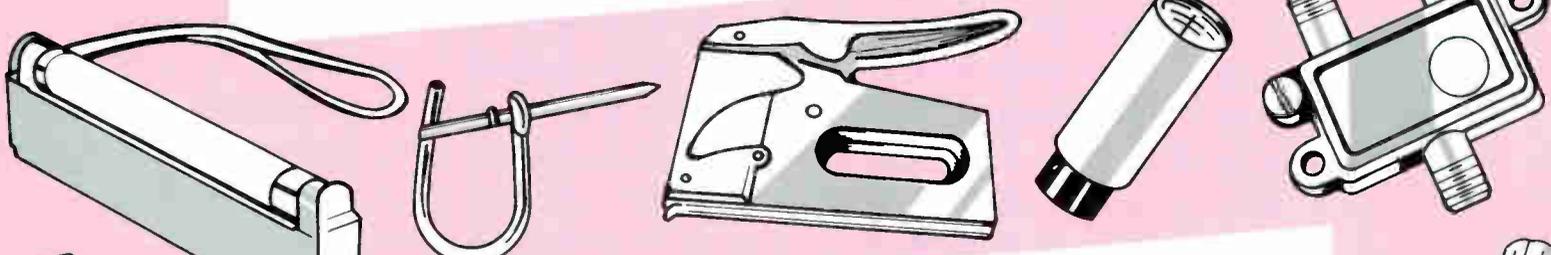
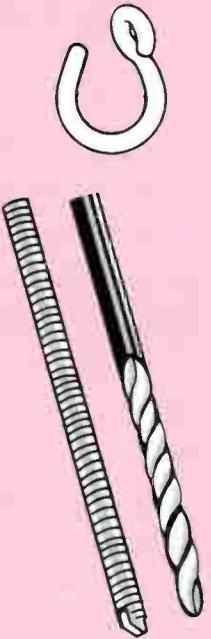
All in all, the Address-A-Trap appears to be a reasonable solution to a problem, and I would advise watching its development closely.

continued



Our 'oddballs' mean "No Sweat" Apartment Installations

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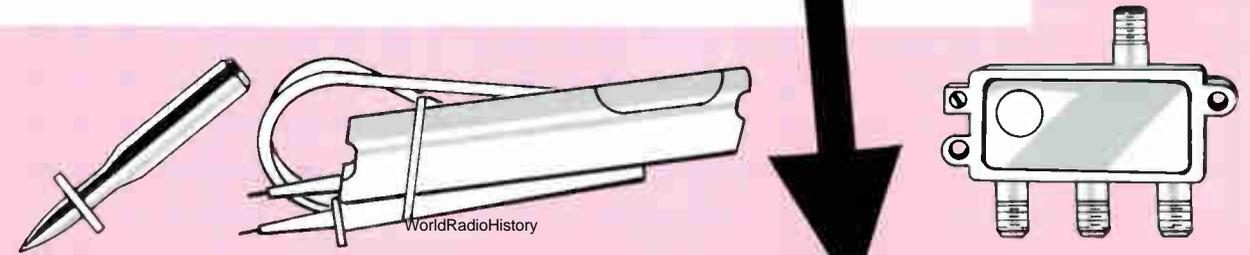


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A



(A) Talk of the GE COMBAND system was all over the floor, and a report follows below on this new bandwidth compression system.

(B) CABLEBUS featured their monitoring center equipment

(C) People were signing up for the free calculator at the SADELCO booth



General Electric Comband

This is a method whereby two different programs are combined in such a manner that only one 6 Mhz channel is used. The idea is that the channel capacity of cable systems, AML links, MDS services, STV stations, etc. can be doubled without increasing the bandwidth. Special equipment will be needed at the sending and receiving ends only. The concept is simple, but it takes a lot of high technology equipment to achieve.

Simply stated, two programs are placed in exact synchronization by using a frame synchronizer. Then alternate lines are taken from each picture and combined together much like shuffling a deck of cards. The resultant mix is modulated and transmitted similar to an ordinary

single picture. At the receiving end the mix is demodulated and then alternate lines are separated and used to regenerate both pictures. Each line is shown twice to make a full 525 line picture. Of course this is an oversimplification as there have been several compensating and signal enhancement operations performed.

When I looked at the demonstration, two things were obvious. The incoming pictures were on a larger screen set (17") while the proposed



pictures were on smaller sets (9") on the other side of the booth. Due to these two factors, a direct side by side comparison was not possible. Maybe they used monitors they had on hand and saved a few bucks by not buying larger sets. Somehow, when you realize how much is spent on this showing, this does not seem very probable.

I asked one of their representatives what effect this process had on the vertical resolution of the picture. After about two minutes of what seemed to be a memorized dissertation on how the color is put into the pictures, and since the color is only for large areas, and the way a picture is modulated, he concluded by saying that the picture would be as good as the original. As near as I could figure out, what he really told me was: I don't know what I am



A



B



C

(A) There was a lot of traffic and interest in the ACSN, The Learning Channel, booth as a former Walt Disney cartoonist set up shop and did quick cartoons of spectators who would pose.

(B) Automatic programming devices were among the various pieces of equipment displayed in the AUTOMATION TECHNIQUES booth.

(C) AVANTEK featured their TO-packaged Mixer and IF Gain Modules for a simplifying TVRO design and increasing quality.

talking about, but with a little luck, you won't notice it.

I then took a close look at one of the programs that had some printing rolling through a commercial. On the small screen the overall picture looked good, but up close, the printing looked a little funny. Some horizontal lines of the letters were two lines wide and others were four lines wide. As the letters rolled up the width of the lines kept changing. On a large screen set this would be bothersome to many viewers. There would be many other subtle differences in the picture quality.

According to the technical literature, the average luminance and chroma content of two adjacent lines is used to make the new line of information that is transmitted. It goes on to say that this kind of processing reduces the noise content and can be used to enhance picture quality and that the resultant bandpass is adequate to give an excellent picture. This is undoubtedly true, up to a point.

The things this whole routine has carefully avoided saying are: In the American (NTSC) picture the color is in only large areas, the fine detail is in the luminance (black and white) channel. The high frequency end of the video bandpass determines the horizontal resolution of the picture. It has nothing to do with the vertical resolution. That is determined solely by the number of unique lines you use to build the picture. No matter how you slice it, they are making a complete picture with only 262+ lines, therefore, the vertical resolution will be cut nearly in half. The resultant picture quality probably

will be adequate for ordinary entertainment programming, but certainly would not be adequate for anything that contains fine printing or where fine detail is required. On a giant screen set the moire effect probably will be severe. It's bad already.

Another important question is what happens to information contained in the vertical blanking interval such as vertical test signals, closed captioning, teletext, etc. They admit usage may be affected for certain types of programs by FCC rules.

I admit they still are working on this and say it will not be available until mid 1984. It seems to me that this has great potential, but it still needs a lot of development before it can be used for high quality pictures. □

Washington Update

Steve Effros Executive Director, CATA



CATA WITHDRAWS SUPPORT FOR HR 5949 — COPYRIGHT “COMPROMISE” FALLS APART, BILL APPEARS DEAD.

The long, complicated political dance over the so-called “Copyright Compromise”, Cong. Bob Kastenmeier’s H.R. 5949, appears to be over. The bill apparently died in two Senate subcommittees after a day of hearings that saw CATA withdraw its support for the bill, and Ted Turner also walk away from the coalition. The NCTA did not formally withdraw its support for the bill, but did make it very clear that they were not interested in pushing the bill to passage unless there was language added to it that would solve the mess created by the recent CRT decision (see the CRT story in this issue).

What’s going on? Why did CATA do an about face again, after reluctantly going along with the bill a few months ago? Well, the best way to explain it is to simply print the testimony CATA’s Executive Director, Steve Effros, gave to a joint hearing of the Senate Commerce and Judiciary Committees. The testimony pretty well tells the story. What you also should know, in reading this testimony, is that in the **24 hours** prior to the December 3rd hearing, all sorts of things were happening — this was all after word had already gone out that CATA and Turner were withdrawing. During that time the NCTA, MPAA, and NAB had a meeting at which the NCTA said it had to get some relief from the CRT decision. They proposed, and the NAB accepted a plan to add an amendment to H.R. 5949 that would have postponed the effective date of the decision and would have had Congress giving the CRT much more specific instructions on what it was really supposed to be doing in these rate proceedings. The key, of course, was to stop the effective date which is now set for December 31, 1982. That is, if you are going to avoid paying prohibitive fees for your extra distant signals, then you **MUST** take them off of your system by that date or you may wind up paying 3.75 percent of basic subscriber revenue for each additional signal. Take a look at last month’s Washington Update for a full explanation.

Anyway, with that as background, you may have a better idea of the chaos that was taking place by the time H.R. 5949 hearing started. The proposed “CRT amendment” was announced by Tom

Wheeler, it was supported by the new President of the National Association of Broadcasters, Eddie Fritts, and Jack Valenti, although not appearing at the hearings, had already let the folks on the hill know that he was dead set against the amendment — that he would oppose H.R. 5949 if any such amendment was added. Then it was CATA’s turn;

Mr. Chairman, members of the Committees, I am Stephen R. Effros, Executive Director of the Community Antenna Television Association. CATA was one of the industry groups that ultimately supported the passage of H.R. 5949 in the House of Representatives. I must reluctantly tell you today that the Community Antenna Television Association can no longer support this compromise legislation. We are withdrawing our backing of the bill at this time and we urge you to vote against its passage.

As some of you already know, CATA had originally planned not to testify at these hearings. We found ourselves in an awkward position of either violating an agreement previously reached or stating things before this Committee hearing that we no longer felt were true. The simplest course seemed to be to not say anything at all. However events have overtaken that decision. We can not sit silently on the sideline while the American viewing public and cable operators throughout the country are being seriously injured and make believe that the legislation you are considering today is in the public interest. It is not.

Let me back up a moment and give you a little history so you will understand why we have had to take the action we are taking today. CATA represents cable operators throughout the United States — both small and large operators. We focus our attention primarily on the non-major urban markets. That is, we leave to the NCTA the formidable task of dealing with the problems of cable television in the large metropolitan areas. We focus on the more traditional systems that have been built and continue to be sought by those who do not already have a multiplicity of television programming available to them.

continued

Those subscribers and cable systems have been dealt a very heavy and unfair blow by a recent decision of the Copyright Royalty Tribunal. They have suddenly, once again been declared "second class citizens" with regard to the television programming they will be allowed to see. We cannot stand by and let that happen without a fight. Until the decision of the CRT was announced the legislation embodied in H.R. 5949, while it did not provide all of the relief from onerous regulations that CATA would have hoped, was at least a step in the right direction for some operators. Of course, for others, as you will hear today, it was a bad agreement. That is the nature of compromise.

CATA was not a party to the compromise sessions. We opposed the entire process from its inception. We believed that the cable television industry did not need to make any further concessions to Hollywood. There is simply no proof that the cable industry is injuring the copyright owners in any way that would warrant the additional relief sought.

However, as you know, as the process of negotiation continued, communications issues became intertwined with copyright issues. In the communications arena we felt that there was considerable merit to some of the provisions included in the ultimate package. In particular, any legislative lessening of the so-called "must carry" rules was favored by CATA members. We believe the "must carry" rules are a blatant violation of our First Amendment rights. They are also a taking of our property without compensation. They are illegal, and CATA will support any Court action seeking their elimination. Absent that, we were willing to support some lessening of those rules in the current bill. Further, at the time the compromise was made we were offered a legislative solution to another problem that had developed at that time; a misreading by a Court regarding the appropriate application of the copyright law to passive carriers. It was that provision that finally induced CATA to drop its opposition to the overall bill and support the compromise.

The members of the Community Antenna Television Association value their commitments. Thus, when a Higher Court reversed the improper ruling and virtually eliminated the need for that legislative language, CATA was asked whether it would therefore withdraw its support for the fragile compromise reached by all of the parties. We did not. We had made an agreement, and although that agreement was no longer significantly beneficial, we did not intend to go back on our word. We decided that we would no longer actively support the measure, but we would not seek to upset it either.

CATA intended to maintain that position until just a few days ago. We, like all others involved in the cable television industry, have been spending the past few weeks analyzing the potential impact of the recent decision of the Copyright Royalty Tribunal to,

in effect, reimpose the distant signal limitations originally applied by the FCC. That, after all, is what the CRT has done. One does not have to delve too far into the figures to find this out. All you have to do is listen to the statements of the Chairman of the Tribunal, who openly acknowledges that he does not expect cable operators to actually pay the prices the CRT has mandated for distant signals. Instead, he expects cable operators to drop the signals! That is an economic reimposition of the old FCC rules.

CATA believes that the CRT has violated its mandate, and the purpose of the Copyright law in what it has done. Copyrights are supposed to not only protect the creator of works, but assure that those works are in fact disseminated to the American public. The CRT has gone about accomplishing the reverse. They have intentionally created a situation that they acknowledge will result in the elimination of programming now seen by the American public.

What is worse, the CRT has chosen to take the course of reimposing rules that originally had nothing to do with copyright, but were protectionist in nature. Those rules were designed to protect broadcast stations in smaller television markets. They intentionally limited the number of television signals Americans could see in those markets in order to prevent competition. CATA has long objected to those rules, and finally, in 1981 they were eliminated upon an irrefutable showing by the FCC itself that the protection was not in any way justified.

The CRT, by economic manipulation, has reimposed those rules. The result will be that American viewers not already receiving numerous television signals will be limited to viewing just one additional "distant" signal, while those who already can see more than one such signal in their own community will be allowed to see more! This is absurd. It is the opposite of the supposed purpose of the Copyright law. It is enforcing scarcity where it already exists and preventing further diversity in those areas that already have it. In short, the rights of the American public are being skewed in favor of the Hollywood marketeers.

Even if H.R. 5949 were the best piece of legislation we had ever seen regarding Copyright — and it is far from that — we cannot now support it unless the American viewing public's rights are reaffirmed in the legislation. The Copyright Royalty Tribunal's decision must be overturned. It can be, by an inclusion in H.R. 5949 voiding the recent decisions of the Tribunal. Were language of that nature added to the bill we would support it. However, without that addition we believe any cable/copyright legislation now adopted would simply perpetrate a continuing fraud on the American public by claiming that the Copyright Law assures the dissemination of literary works to them while in fact the law is being used to deny access to those very works.

I said in the beginning of this testimony that CATA reluctantly must withdraw its support of H.R. 5949.

That is true. We would prefer to honor our commitments to Mr. Kastenmeier and the members of the House of Representatives to support the bill. Events, however, have forced us to weigh those commitments against our overriding obligation to properly represent our membership, and the viewing public they serve. We must come down on the side of honesty and candor. CATA can no longer support H.R. 5949 in its present form. We will actively work, and seek to form a coalition of others in the industry to prevent the passage of H.R. 5949 or any other cable/copyright legislation until the Congress addresses the vital issues we have raised here today.

Thank you for this opportunity to appear before you today. I would be more than happy to answer any questions you may have.

Well, that's it. We just couldn't go along with the bill anymore. Suffice it to say that there are some folks up on Capitol Hill who are very upset with us right now, but there is nothing we can do about that. We have an obligation, our primary **obligation**, to represent you — the cable operators throughout the United States who will be forced to drop programming that your subscribers want to watch. We had to take a stand, and we did.

What has happened since then? Well, after our withdrawal, the sports folks got up and said they didn't like the bill either because they want total blackout rights for all games of the same sport when a professional team is playing at home! That's absurd. All they are really trying to do is lock up the sports programming market for themselves and then they will go on a specialty pay network basis after they have forced the fans to be able only to watch their games! We couldn't go along with that and Congress knows, or knew, that the entire cable industry would walk out of any agreement that had a total sports blackout in it.

The Senators also heard from Rod MacLoed, the fellow we told you about last month who blacked out all his channels one night to let his subscribers know what was about to happen, and Chuck Dolan, as well as Dick Leghorn, who all testified against the bill primarily because of the effect of syndicated exclusivity. Needless to say, if the Senators thought they had a "noncontroversial" bill that they could get through during a "lame duck" session, they didn't think so after that day of hearings!

As of the time this article is being written, it appears that H.R. 5949 is dead. Both the Judiciary and Commerce Committees in the Senate have postponed any "mark-up" of the bill, and they may simply never get to it. As a practical matter, since Congress plans to adjourn on Dec. 17, there does not seem to be enough time to get the bill through at this point anyway, unless there are some major

concessions on several issues that result in a new agreement. That does not seem likely. This is true even though Congressman Kastenmeier, who has been working very hard on this bill all along, is putting some last-minute pressure on the NCTA, the sports people, and the MPAA to patch up the deal. We don't see how it can be done. Despite comments like those of Senator Kasten from Wisconsin, who keeps insisting that cable and the sports people ought to sit down and negotiate, there does not appear to be anything to negotiate about! There is no "compromise" position on a "black out", which is what they are demanding. You either black out the signal, or you don't! There is no room in between — you can't "grey-out" the signal! So unless there is some miraculous turn-around, it appears that the "Copyright Compromise" is finally dead. It has taken a long time, and it is a shame CATA was not listened to right at the start of this nonsense. You will remember at the time we opposed the concept of additional copyright legislation and said that the political situation was such that we had sufficient power to stop any adverse bill from going through Congress (such as the one feared by the NCTA at the time that would have eliminated the compulsory license). That turned out to be true. What is also true is that all the other parties have enough power to kill bills they think are bad too. Thus we

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have a stalemate. This should not come as any surprise — after all, it took eleven years of fighting over cable/copyright on Capitol Hill before the 1909 Copyright Law was finally changed in 1976! We would guess that there will now be an equal period before Congress tries to change the law again — that is unless we have to go back up there to clear up what the CRT had done. That is already in the works — read the other article in this issue on the CRT decision for an update on that.

In (hopefully) closing the book on H.R. 5949 and its ilk for the foreseeable future — after all we are just as tired of fighting this battle as you are of reading about it — we should just note the ultimate irony of it all that Jack Valenti, the man who started the whole thing by calling on Congress close to two years ago to reopen the Copyright Law debate because of what the FCC had done, wound up being the one who ultimately killed the bill! Had he agreed to the “CRT amendment” the bill probably would have become law. And so it goes.

STAY OF CRT DECISION PENDING IN COURT AND CONGRESS

We are expecting some action any minute on the appeals that have been launched by the cable

industry regarding the CRT rate increase of additional distant signals.

Now we are not going to go through that whole explanation again — just look at the last months issue of the *Washington Update* for a full-blown description of the decision as well as the impact on your particular system. Only one thing, which we thought was obvious, needs to be added to last month’s explanation; as you will remember, if you added any distant signals to your system after the FCC got rid of its distant signal rules in 1981 that you could not have legally carried before that time, then you may have to pay 3.75 percent for each such independent signal IF you file your Copyright payments based on DSE’s (Distant Signal Equivalents — the “Long Form” for Copyright filing). What you should remember is that if your system is **OUTSIDE** of all markets then regardless of how big it is, the 3.75 percent does not apply because the FCC never had any restrictions on the signals you could carry in the first place.

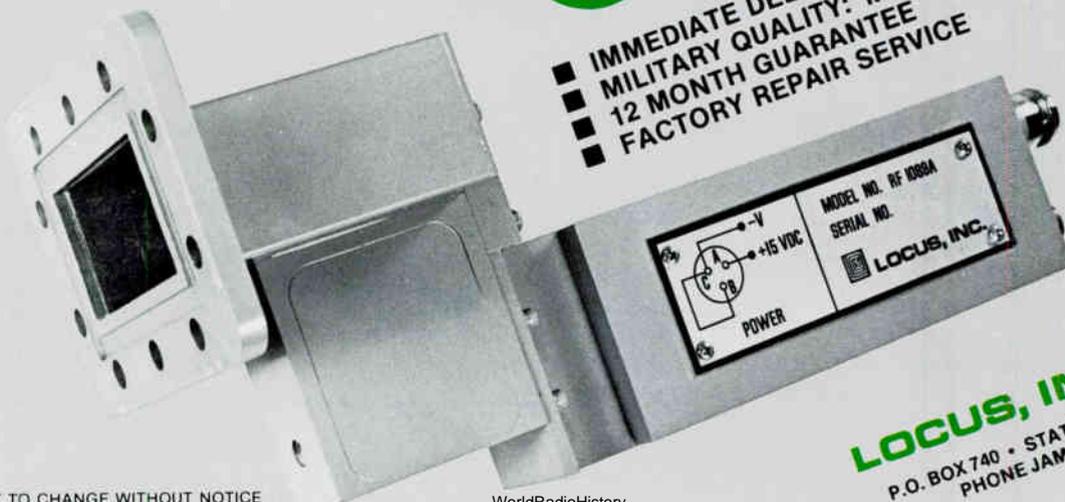
Now, having cleared that up, let’s go back to the appeals. One is in the Courts right now. It has been filed by the NCTA, and CATA is in total agreement with it. United Video and Ted Turner have also filed, as well as many others, including even Congressman Kastenmeier, who says in his

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brief that what the CRT did is clearly against the mandate of Congress — and he should know, after all, he helped write the law! What the cable interests are asking the Court to do is put off the effective date of the decision totally until the Court decides whether the action by the CRT was legal. If the Court agrees to do that, it would mean that cable operators would be allowed to continue to carry the signals they are now carrying without any subsequent imposition of extra fees if the Court ultimately found that the CRT action was legal. Again, as this is being written the Court has not acted, but it is expected to act prior to the time we can print this Washington Update and get it into the mail to you. If that happens and there is any change in the current situation — that is, that you will have to either drop the signals or pay the fee after December 31, 1982, we will make every effort to let you know before the cut-off date. We were hoping (and it may still happen) that the decision will be made and an announcement can be included in this issue. We must tell you that any relief from the Court is a 50-50 chance at best. Again, see the last month's issue of the Washington Update for a full explanation.

While the Court case is going on, there is also activity on Capitol Hill. Ted Turner's people have made a valiant effort to get a special piece of legislation passed as a "rider" to the continuing appropriations bill that would also stay the effective date of the CRT ruling. Moves are being made in both the Senate and the House. It is a long shot because everybody knows what is going on, and the broadcasters have already told almost every Senator that they are against any such independent bill. Jack Valenti and the Sports folks are also. So this is not one that is going to "sneak" through. If it goes anywhere at all, it will go because of the merit of the argument. Again, we will have to wait and see, but again we would have to say that the chances of such a "bullet bill" getting through in this lame duck session are very slim. Naturally we will keep you informed as best we can about all these fast breaking events. To say the least they are keeping the Washington Office busy!

HAVE A HAPPY HOLIDAY!!!!

We could go on and on, and on about all the things happening in the cable television industry. The mergers, the new companies, the franchise fights, the profits, the losses — but really, that's not where we are all focused at the moment. The industry will still be with us in January when we get back to all those mundane and exciting things — and CATA will be there to keep you up to date on all of it. For now, however, our hope for all is a prosperous and above all peaceful and happy holiday season. The CATA staff in Oklahoma, Washington and Florida wish you all the best — and a happy new year! □

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The Inclined Geosynchronous Orbit

The geostationary condition is often taken for granted by satellite users, but never by those whose task it is to monitor and control the position of a communications satellite. It's not simply a matter of ensuring that the bird is placed into a circular orbit above the equator, at the right height that its orbital period matches the earth's rotation period. That is only a start, for whatever the precision of that orbit insertion, forces are constantly at work to move the satellite away from its "geostationary" point.

The longitude of a satellite's "station" is the co-ordinate with which we have the most familiarity. Longitude must be held to a prescribed tolerance, or the satellite will drift east or westward, out of our (and everyone else's) fixed antenna beam. And the drifting satellite would encroach upon its neighbor's space "territory" with potential co-channel interference (decrease of carrier-to-interference ratio being manifested initially as noise, in the FM system). Minimum satellite spacing in the US domestic arc is currently four degrees of longitude, with the FCC proposing to tighten this up to three, or even two degrees, a proposal which has been discussed in CATJ. The Intelsat satellites already operate at three degrees longitude spacing.

The forces causing longitude (east/west) drift are gravitational. Not only is the orbit perturbed by the pull of the sun and moon, but also by the earth itself. In the

equatorial plane, the earth's cross-section is not perfectly circular, with the result that the strength of the gravitational field varies with longitude. The effect is to pull an uncontrolled satellite away from one of the two "hills" of unstable equilibrium near to 11°W and 162°E, into the nearest of two "valleys", located at approximately 105°W and 75°E. Midway between each hill and valley is a region of maximum east or west influence. To maintain a satellite on station here demands a mean west or east acceleration of around 2.25 meters per second per year, though of course the station-keeping burns are applied as impulses, timed so as to maintain the required longitude tolerance, ± 0.1 degree for a C-Band domestic satellite.

But lunar and solar forces also perturb the orbit in the other two directions, perpendicular to the direction of orbital motion. In the up/down (altitude) direction the effect is to decircularize the orbit. The resulting slightly elliptical orbit results in an apparent diurnal (daily) east/west motion about the nominal geostationary point. Fortunately orbital dynamics are such as to give the circular orbit considerable "stiffness" of its own to resist this distortion, and ellipticity is generally held to an acceptably low figure throughout a satellite's life.

The third direction, north/south, is the one which demands most fuel to control. Again it is the moon's

and the sun's gravity which influence a satellite to move north or south of the equatorial plane. Given an initial movement in one direction, say north, the spacecraft must continue to orbit the earth's center, so twelve hours later, it will have crossed the equatorial plane and will then be south of its correct geostationary position. The effect is not to move the bird's orbital plane north or south of the equator, but to tilt it by the inclination angle, i (see inset to Figure 1.).

Change of inclination angle is a slow process, a little under one degree per year, and in the short term the orbital plane remains fixed in space. So relative to the rotating earth's surface, the instantaneous satellite location swings slowly north and south of the equator over the 24-hour period. For a perfectly circular inclined orbit, the path traced out is a long, slim figure eight, the satellite moving fastest at equator crossing (node) and slowest at north and south apex. The period of this motion is in fact 24 hours in sidereal time, equivalent to 23 hours 56 minutes 4.09 seconds (approximately) in mean solar time, allowing for the earth's progress around the sun in the course of one rotation (day).

The actual shape of the figure-eight curve depends upon the value of the inclination angle, i . Figure 1 shows at left the track of the sub-satellite point for an inclination of 30 degrees. The numbers along the

curve are hours from ascending node (north-bound equator crossing). By contrast, the short line at the right of the diagram is the ground track for three degree orbital inclination, drawn to the same scale. To make it clearer, I've scaled it up by a factor of ten and redrawn it at center. Its width in the east-west direction is seen to be a small fraction of its north-south extent. In fact the east-west component of motion is less than ± 0.04 degrees in longitude, for $i = 3^\circ$. Considering that even a 6-meter antenna has a half-power beamwidth (at 4 GHz) of 0.9 degrees, and that the domestic birds have a stationkeeping tolerance of ± 0.1 degrees or better, it is clear that we can neglect the **width** of the figure-eight curve for all practical purposes, for small values of orbital inclination.

When it comes to tracking an inclined orbit geosynchronous satellite, the direction to be tracked is **out of orbit** or **declination**. With a polar or modified polar mounted antenna this is a simple matter, re-

quiring just one jack or actuator to move the antenna at right angles to its polar (hour angle) drive. Mechanical implementation can be something of a headache if the antenna has only a fixed declination offset, as a new bearing axis must be provided between the polar carriage and the dish itself. But since the diurnal motion can then be tracked to a very close approximation by a single axis drive, the control logic is simplified. A level sensing step-track algorithm could be incorporated, for auto-tracking, or the declination axis could be clock-controlled, in sidereal time.

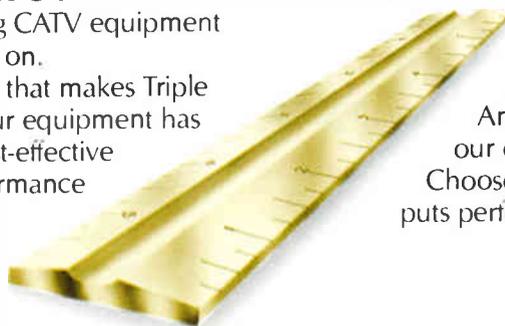
With an elevation over azimuth mount, the antenna must be steered on both axes to follow the diurnal motion, except in the special case where the satellite is on the meridian (satellite and terminal share the same longitude, satellite being due south). In this case only elevation drive is required. **Figure 2** shows the south-east portion of the sky, in azimuth and elevation co-ordinates, as seen from New York City. The Sym-

phonie pair have the largest inclination of the birds currently operational (about 3.5 and 4 degrees), and it can be seen that the New York antenna must move more than five degrees peak to peak over the 24-hour period, in each direction (azimuth and elevation). Certain satellites are shown with projected launch dates to 1984. Among these is the NASA TDRS-2 bird at $41^\circ W$. This will have an intentional inclination of up to 7 degrees at beginning and end of life, demanding considerable tracking, as shown.

Other satellites with smaller values of i are the two old Intelsat IV spacecraft, **F4** and **F7**, serving as inter-region spare and Mexican lease respectively, with inclinations of 0.5 to 1 degree, and the two Soviet birds, the Gorizont at Statsionar-4 and the Raduga at Statsionar-8, with inclinations between 1 and 1.5 degrees. The larger inclinations, like that of Symphonie, often result in the satellite being missed completely when scanning the sky, but these smaller values have caused conster-

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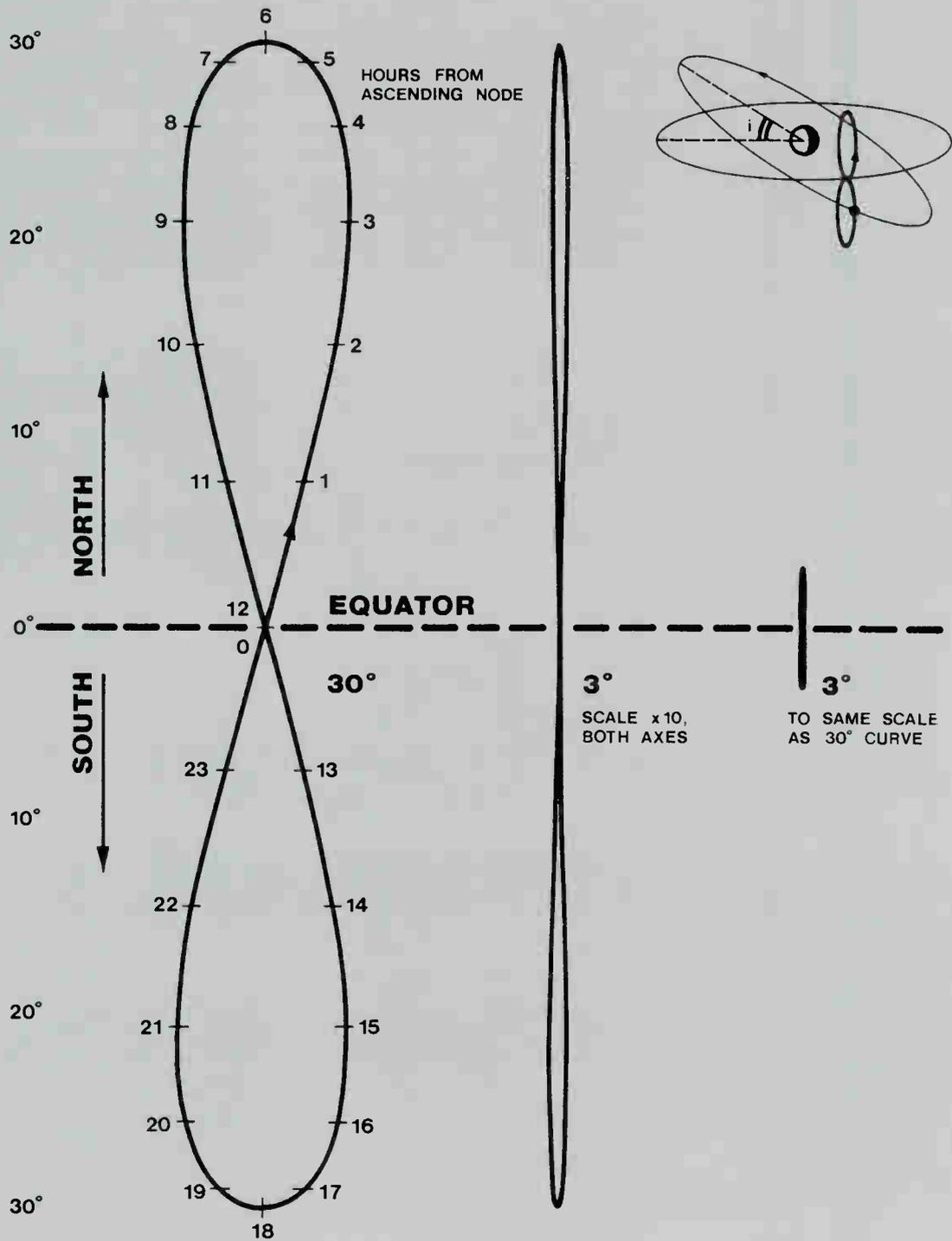


FIGURE 1
"FIGURE EIGHT" Ground Tracks of Inclined Circular Orbit Geosynchronous Satellites

nation in some quarters when an antenna has been rigged in the morning to give excellent results, and the user has seen his picture subside into sparklies by evening, only to return revitalized the following morning! And you can't even depend upon antenna look angle always being constant for a given time of day, as the figure eight pattern repeats itself some four minutes earlier each day — after 6 months northern and southern apex will have changed over. **Moral: don't use a non-domestic bird to check polar mount tracking at extremes of arc!**

The maximum peak to peak tracking angle is actually larger than twice the inclination angle, by a factor of between 1.012 and 1.178, dependent on relative location of satellite and ground station. This is because the terminal is always nearer to the satellite than is the earth's center, where the inclination angle is measured. The largest angle occurs when the mean satellite position is directly overhead at the earth station, and for an inclination of 4° (Symphonie) amounts to a total of $2 \times 1.178 \times 4^\circ = 9.424^\circ$ peak to peak. This hypothetical case actually puts the terminal in the Atlantic. The approximations here hold good for small values of i , says less than 10° .

Incidentally, the size of the satellite symbols in **Figure 2** shows the way they would look to a 5 meter antenna (beamwidth one degree) - this resolution is insufficient to show the width of the figure-eight loops.

So why do some satellites make it difficult for us by having a tilt to their orbits? It's all bound up with stationkeeping fuel capacity. Fuel is expensive on satellite mass. North/south stationkeeping demands an acceleration of around 45 meters/seconds per year, and is the most greedy long-term user of on-board fuel. It doesn't take significantly more fuel to hold ± 0.1 degrees than it does for ± 0.5 degrees (just more frequent burns) - the only real saving is to dispense with it completely. So in the design trade-offs between solar array mass, extra transponder or battery capacity etc versus station-keeping fuel, a

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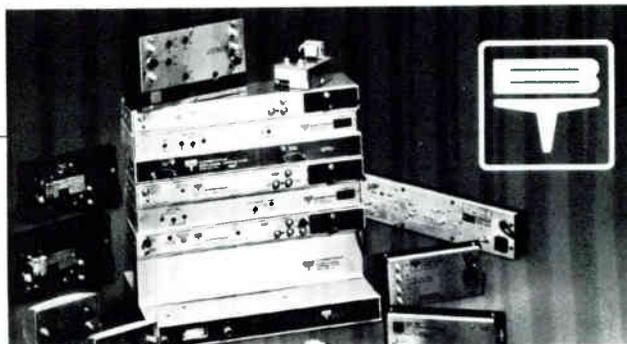
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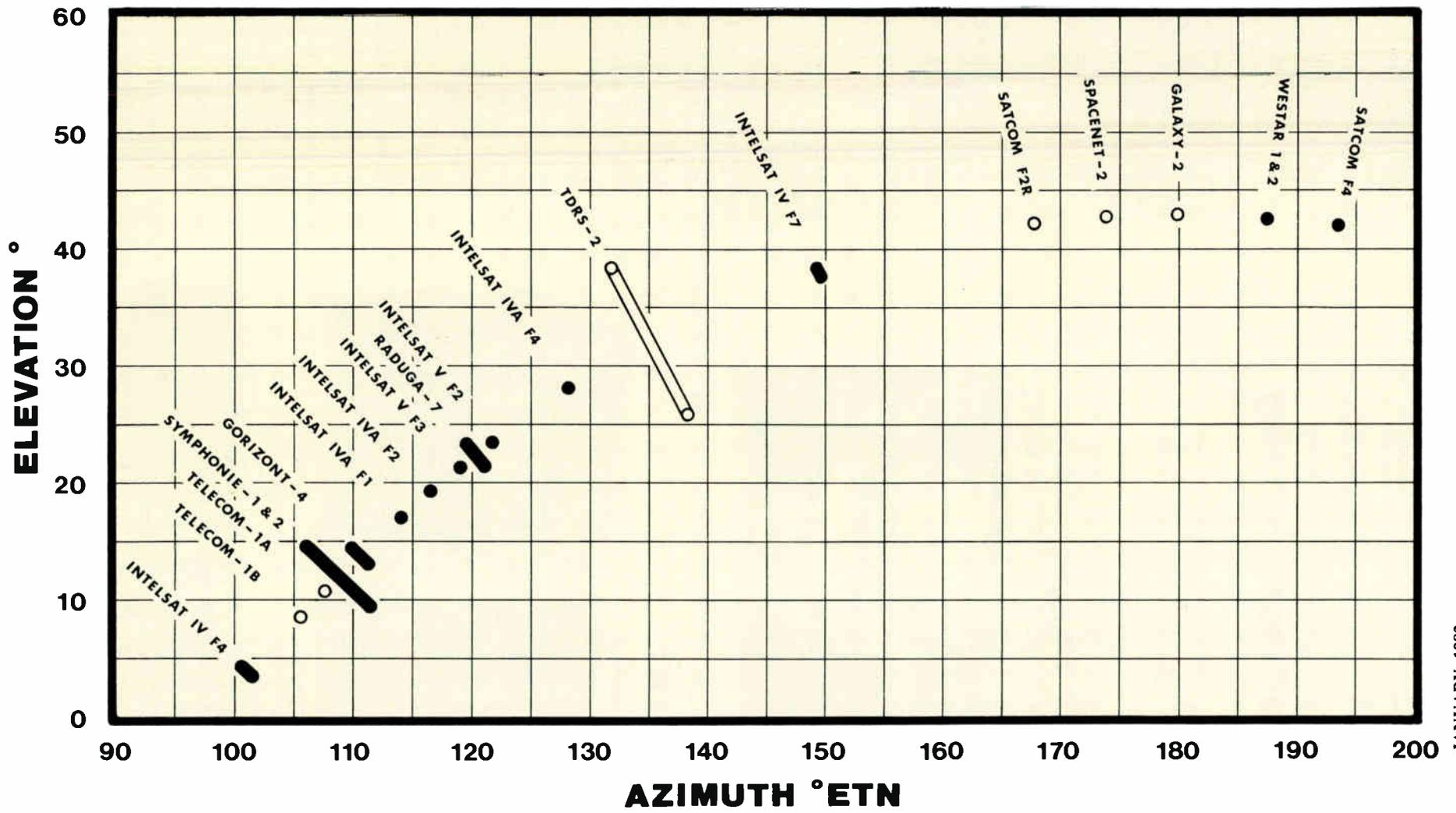


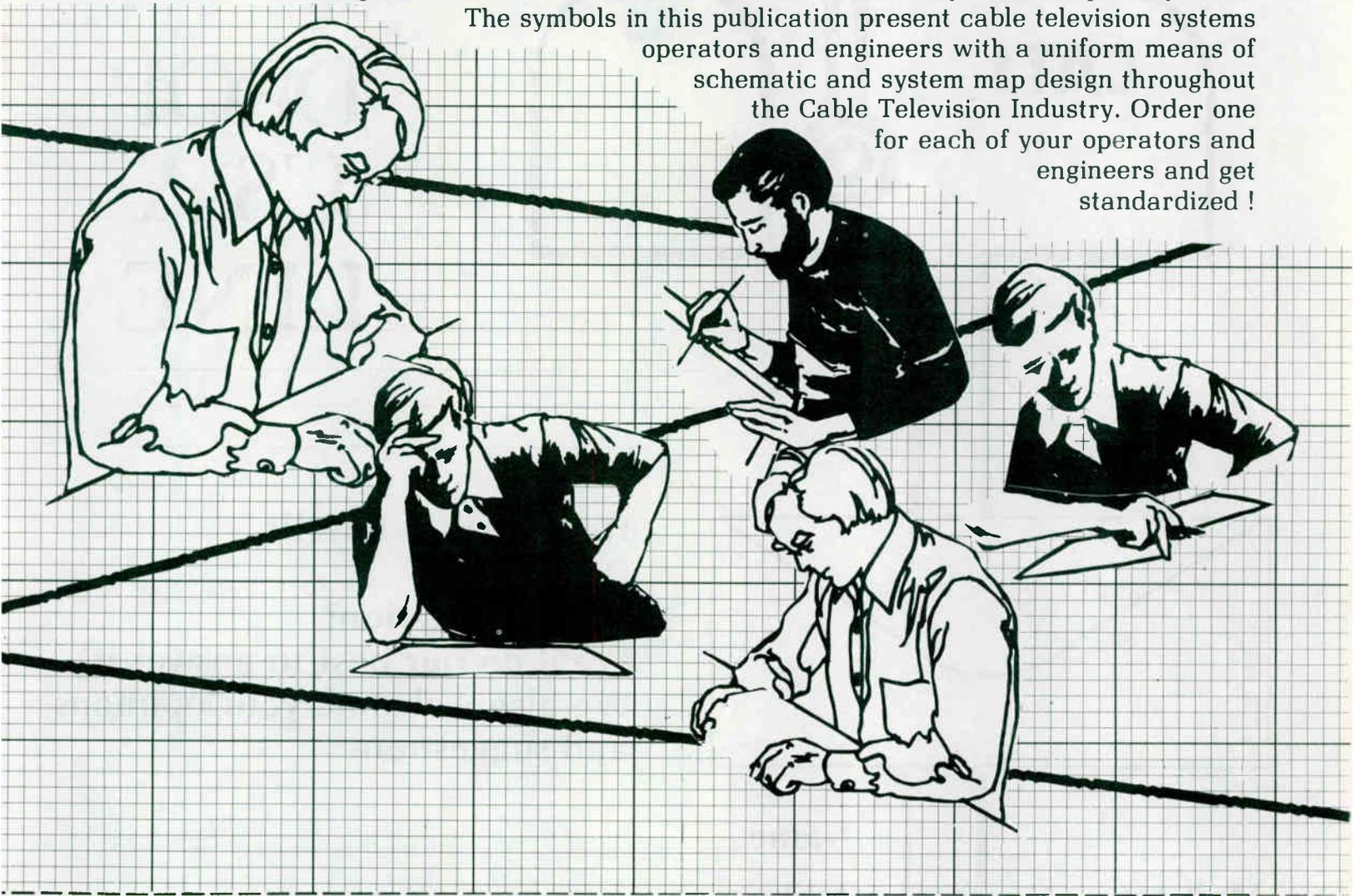
FIGURE 2
EL/AZ View of South-Eastern Sky from New York City Showing Geostationary and Inclined Orbit Geosynchronous Satellites.

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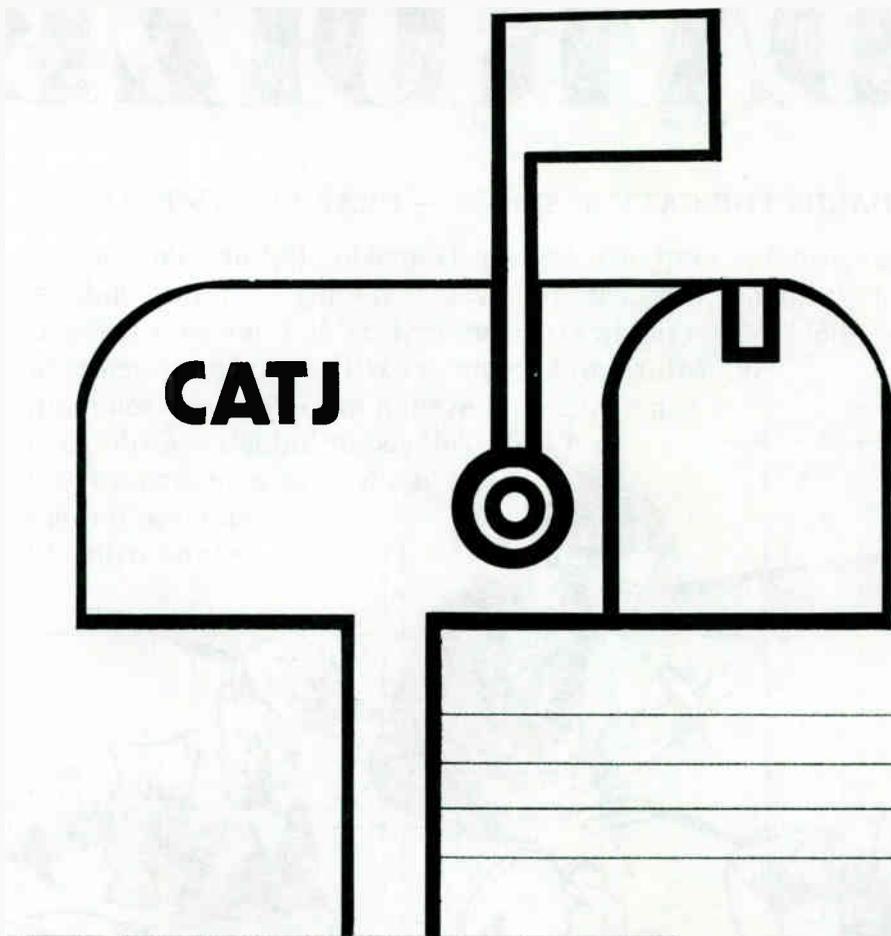
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lifetime has to be defined during which the orbit will be maintained to specification. As the end of that design lifetime approaches, all systems may be looking good for another three years but fuel depletion is well advanced. At that point the decision must be made to relinquish north/south stationkeeping, or risk having insufficient fuel left to maintain orbital longitude (east/west stationkeeping) or even spacecraft attitude (hence antenna pointing). Domestic satellites must maintain station to the end, but international birds operate through a network of ground stations with full auto-tracking, so can afford to 'go inclined' while prolonging their useful life. This is precisely what has happened with the Symphonies, the Intelsat IVs, the Raduga and the Gorizont.

As time proceeds, these inclinations will increase, at the rate of almost one degree per year, until the satellites are replaced and retired, the last stocks of fuel being used to kick them out of geosynchronous orbit to lessen the hazard of future collision with an operational satellite.

While we are looking at that part of the sky (Figure 2), here's the latest news from the Atlantic region: Brazil has taken out a new TV lease - a full transponder 6 (Tpdr 11 in US format) on global beam, Intelsat IVA F2 at 21.5°W. 525 lines, PAL-M color, 5.8 MHz subcarrier audio. Venezuela is new up on Intelsat V F2 at 27.5°W, full transponder 3 (US Tpdr 5) on western hemispheric, 525 NTSC and an excellent signal in Tennessee, writes Mark Long. And another newcomer on the same satellite, Portugal on global transponder 10, (US 20) 625 PAL with 6.6 MHz subcarrier audio, and the only eastern lease currently on global beam, visible in the USA. Also new is the Soviet activation of the Stationar-8 slot with an old Raduga, F7. This is too close to the Intelsat slots at 24.5 and 27.5°W to permit use of the 3.7 to 4.2 GHz band, but the Raduga is downlinking a transponder at 3465 MHz, alternately with FM/FDM and digital modulation. No TV has been seen. □



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Bronx 212-829-1070

S.A.L. COMMUNICATIONS
California:
Chatsworth 213-241-9100
Georgia:
Decatur 404-981-0050
Indiana:
Indianapolis 317-244-2477
New York:
Melville 516-894-7110
Texas:
Dallas 214-349-8811

TELE-WIRE SUPPLY CORP.
Florida:
Sarasota 813-371-3447
Michigan:
Three Rivers 800-253-2069
New York:
Great Neck (Headquarters)
516-329-8454
Pennsylvania:
Simpson 717-282-2340
Texas:
Grand Prairie 800-527-1646

THE DROP SHOP LTD.
California:
Hayward 415-887-7474
New Jersey:
Roselle 201-241-9300

TONER CABLE EQUIPMENT
Pennsylvania:
Horsham 800-523-5947
Pennsylvania Only 800-492-2512
TVC SUPPLY CO. INC.
Pennsylvania:
Hershey 800-482-2398
East of Mississippi
800-233-2147

Distributors in Canada:

ANIXTER-MICRO SAT
Pickering, Ontario 800-265-4655
INCOSPEC ELECTRONICS, INC.
Montreal-Nord, Quebec 514-322-5540
R.F. COMMUNICATIONS LTD.
Ontario 416-475-1030
TECH COMM SALES, INC.
Burnaby, British Columbia 604-437-6122

Cable Health Network

ADDRESSES THE ERA OF LIFESTYLE DISEASES

The perennial New Year's resolution for most Americans is to correct the excessiveness in their eating and drinking habits, accountable to the socializing which begins usually around the Thanksgiving season and continues through the holidays of Christmas and New Year's. But now, there are even more Americans interested in health care and the prevention of sickness than in past years. Independent studies* have determined that there are 53% more Americans concerned about health and well-being than there were five years ago; these same studies have determined that there are also 53% more Americans concerned about their personal finances than they were five years ago. These two play hand in hand as figures indicate that there was over \$300 billion American dollars spent in 1981 on health and physical fitness with \$287 billion spent on health care nationally, \$19 billion on physical fitness, \$18 billion on hospital care, \$55 billion on physicians' services and \$727 million on exercise equipment during the same period. Convinced?? Without question, the populus is concerned about spending **less on medical care and more on preventive medicine**, thereby creating a state of well-being and health as informed consumers make wiser decisions regarding health care spending.

What does all this have to do with your cable system operation? CATJ is pointing up the influx of concern for these areas of health care and highlighting the tremendous programming that the **CABLE HEALTH NETWORK** has developed to bring to cable viewers 24 hours a day, 7 days a week — motivating programming dedicated to those who want to improve their own health and well-being, keep fit, think healthier and make a good life better. **CABLE HEALTH NETWORK** delivers these programs to fit every viewer's needs!

Why a Health Network? Wonder if that's a little much? Put your questions aside, because the day of concern has arrived. According to independent studies, it has been proven that Americans now want to see more health and science programs on television than more news, comedy, or sports!! **Four out of every five Americans** are interested in seeing programs on health and medical developments, with more than two out of three interested in learning more about health, diet, and vitamins. If you question the rise of interest, look to the health publications that have surfaced in the last four years — this points out that periodical publishers are recognizing this demand, and, as a result, there have been at least eleven publications, covering such topics as

health, science, fitness and consumer awareness, organized and developed. The beauty of the **CABLE HEALTH NETWORK** is that one channel accumulates information on health and science issues and delivers it from one source, where it takes several different magazines to cover the same subjects.

Perhaps you're not all that familiar with the programming that **CABLE HEALTH NETWORK** delivers — here's what is being offered:

PROGRAMMING FOR EVERY AUDIENCE

What's New In Health And Science?

Daily, in-depth magazine-style programs about medical breakthroughs and scientific advances, and how they affect or lives.

Self-Help And Medical Care

Programs designed to promote the overall "wellness" of viewers by providing up-to-date, practical information to help people better understand their health concerns.

Healthy Relationships

Programming specifically devoted to the crucial elements that keep people together, or apart. Viewers learn about strengthening



NEW PRODUCT REVIEW

good relationships and building new ones.

Science, Nature And Technology

Enlightening and entertaining programs designed to inform viewers about how changes in the environment and advances in science and technology affect the way we live.

Human Interests And Lifestyles

Insights into the way others live, inspiring viewers to set new goals and providing information and alternatives about a broad range of activities.

Nutrition, Diet And Eating Well

Programming committed to promoting good health through good nutrition.

Keeping Fit

Programs provide viewers of all ages with exercises and recreation tips designed to improve and maintain their health.

Growing Up

Programs dealing with the experience of raising children in today's challenging social environment.

Getting Older, Feeling Younger

Innovative programs designed to contribute to the well-being, fitness, nutrition, medical care and emotional health of older Americans.

Health And Science Breaks

A series of 60-second spots that touch upon topics of interest from

each of Cable Health Network's programming categories. They also provide advertisers with a forum for showcasing ads.

In developing the programming for the **CABLE HEALTH NETWORK**, the designers worked into a format to appeal to all age groups, as shown below:

Health and Science programs on broadcast stations have consistently drawn healthy ratings and a desirable, young audience composition.

Percent Adults 18-49 of Total Adults	
Nova	51%
Odyssey	53%
The Body Human	54%
Cosmos	59%
Omni	60%
Walter Cronkite's Universe	62%
Richard Simmons	67%
Reach Into Space	71%
Morning Stretch	74%

An independent program study has confirmed that many of Cable Health Network's programs appeal to adults 18-49.

In addition, Cable Health Network has designed specific programming to reach other age groups as well. Several programs, for example, "Join the Group" and "Getting Older, Feeling Younger" are

directed towards the 50+ age group.

To further prove the high level of interest it has been interesting to note **viewer response** to health-oriented programs that have been presented, with the expectations of response far exceeding what was predicted. For example,

- 60,000 Los Angeles junior high school students participated in a five-day televised smoking prevention program.
- On the NBC "Today Show" in January 1982, a series on headaches prompted 170,000 viewers to write in for a health tip brochure.
- A five-day series on breast cancer prompted 100,000 women to write in for a self-examination brochure. Result—20 breast cancers were detected in early curable stages.
- 125,000 Los Angeles viewers wrote in for weight loss brochures. The American Heart Association estimated, based on their survey, that viewers lost one million pounds during the series.

Viewer Response continued on page 42

Cable Health Network Programs

Special Presentations

As their titles suggest, the series ARE YOU LISTENING?, HEALTH-LINE, THE INNER WOMAN, COPING and the documentaries, mini-series and award-winning shorts showcased in this time slot cover a wide range of physical and emotional health concerns. Much of the material presented has never been seen on television. Cable Health Network is proud to debut these intelligent, pioneering works.



Regis Philbin's Health Styles

Regis Philbin joins medical authorities and celebrity health enthusiasts in discussions and demonstrations concerning exercise, fitness and diet. Viewers are offered information to make them feel great, served with an abundance of humor.

New Way Gourmet

Paul and Diana Von Welanetz, cookbook authors and gourmet chefs, are joined in their kitchen by celebrity guests where they demonstrate healthful recipes that are delicious and nutritious. Kitchen "gadget tips" are a regular feature, as are the recipes that viewers request in droves.

The Charlie Rose Show

Charlie Rose is at home with renowned and interesting people. His interviews and in-studio discussions include authorities who draw on the carefully selected studio audience for their input on a wide variety of health and life-style related issues.

The Sporting Life

Sports reporter Charlie Coane takes viewers on a tour of the pleasures and pitfalls of outdoor sports. Viewers learn how to get started in the sports they've always wanted to try, with suggestions for purchasing or renting equipment. In-studio demonstrations and interviews with leading sports figures and footage of such diverse activities as water skiing, hot air ballooning, roller skating and running make this show a standout.



The Do or Diet Show

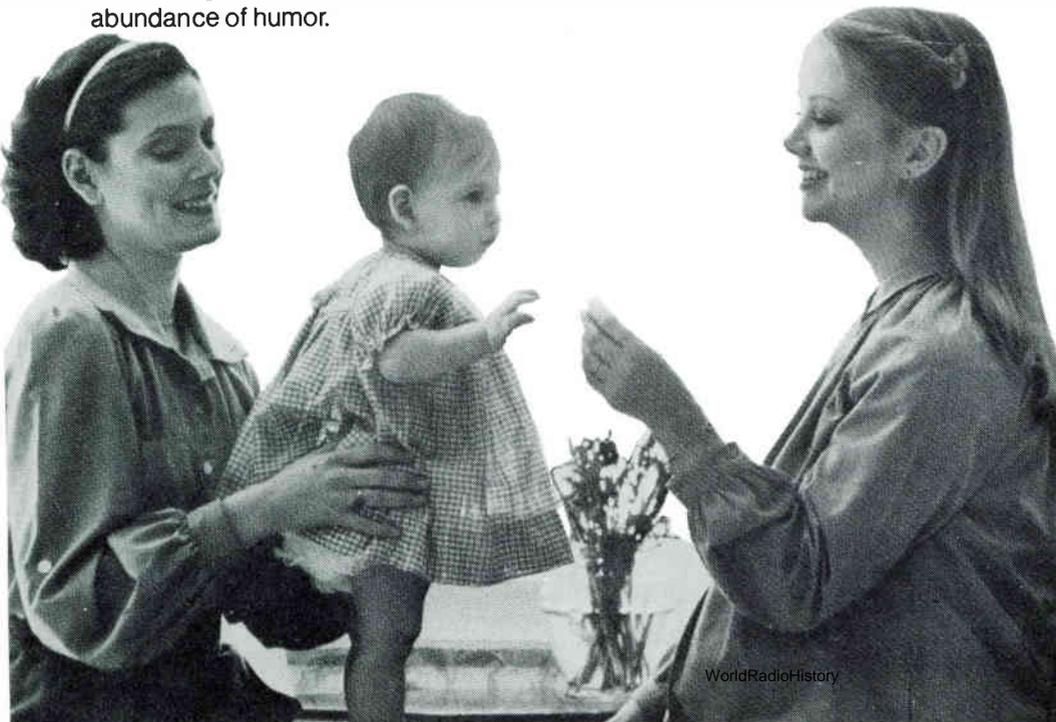
Charles Nelson Reilly hosts a show for the diet conscious that focuses on the lighter side of shedding pounds, trimming down, lo-cal cooking and diet success stories to emulate. Celebrities divulge their secrets for a more beautiful body and The Do or Diet Show's diet doctor rates current diets and offers some very sane, simple advice. Viewers participate with the studio audience regulars during weekly weigh-ins.

Medical Marvels

Exciting medical reports on advances in modern medicine. The emphasis is on how patients overcome enormous physical obstacles with the help of medical technology. The show is filmed entirely on location. Viewers get a firsthand look at new surgical techniques, as well as some off-beat methods of healing.

Crisis Counselor

The setting is the family counselor's office, where counselor Thomas Thompson hosts this series in which actors dramatize problems that are really experienced by families in crisis. Viewers can learn about healthy family dynamics and strategies for improving family communications.



Join The Group

The concerns of Americans who are getting older are addressed by noted actor Arthur Hill. The group is led by family and marriage counselor Mel Krantzler. It's a chance for group regulars and viewers to learn how different people handle the challenges and frustrations of aging.

The Nature Of Things

Host David Suzuki takes the viewer throughout the world to gather information about the mysteries and marvels of nature and the latest in scientific discovery and controversy. The show is distinguished by its spectacular photography and insightful narration.



The Weekend Athlete

For those Americans who work during the week and work out on weekends, there's The Weekend Athlete. This show guides viewers in planning training routines, improving their stamina and exercising intelligently—on any and all days. It's hosted by well-known sports medicine specialist Dr. Alan Selner, who provides demonstrations, exercise regimens, commentary and tips on buying equipment and sporting gear. Advice and encouragement come from America's most famous sports stars, trainers and celebrities.



It Figures

Charlene Prickett has an entire exercise cycle which is completed within each episode of the show. Warm-ups, stretching, work-outs and cool-downs are incorporated in a positive and supportive style. Each segment also features a discussion with an expert about one particular part of the body or a particular exercise problem.

Human Sexuality

Sharon Goldsmith, registered nurse and certified sex educator, hosts this candid series of thoughtful and frank discussions. With her aid, and the aid of her expert guests, viewers can become more understanding about human sexuality.

Take Charge!

Over the course of a week, nationally syndicated columnist Dr. Lester Coleman explores one medical or psychological problem in a group discussion format. The social, emotional, physical and medical aspects of each problem are covered with great thoroughness. The name and address of the relevant referral organization is provided to viewers.



Breaking The Habit

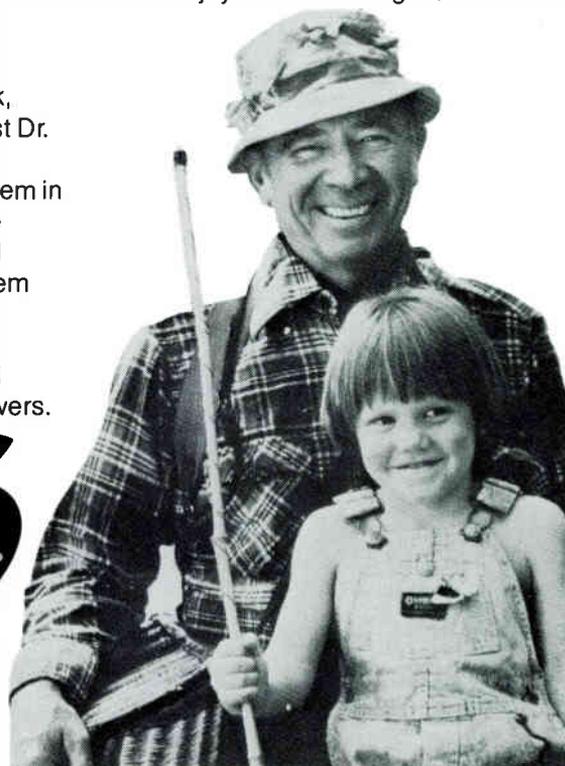
Almost everyone has at least one habit that needs breaking. Smoking. Drinking. Drug abuse. Gambling. Hostess June Lockhart talks to medical, psychological and psychiatric experts about habitual behaviors, methods of treatment and the best ways to conquer habits. Celebrity guests reveal how they successfully conquered unwanted habits.

The Body Factory

Candy Colby, physical fitness instructor, conducts a program of vigorous aerobic and standard exercises for everyone who wants to get in shape and stay in shape. A different guest joins her on each program and together they show viewers how to develop a healthier body through a regimen of regular exercise.

Real Life Stories

Viewers are taken into the homes of American families who are coping with a variety of problems. Psychologist Tom Cottle asks for reactions from the studio audience watching these same families. Viewers get a profound sense of what it's like for others to face and courageously overcome their difficulties, ultimately leading to a joyful and fulfilling life.



- San Francisco researchers reported that a ten-day series on depression significantly helped viewers. 83% said they would tell others to watch the segments if they were shown again.

From these results, it is apparent that indeed there is a desire for and a commitment to health programming.



The **CABLE HEALTH NETWORK**, founded by Dr. Arthur L. Ulene, Chairman, and Jeffrey C. Reiss, President and Chief Executive Officer, is an affiliated company of Viacom International Inc., a well-known diversified communications and entertainment company which develops, produces, and acquires programming for all media, provides premium entertainment services for pay television, distributes television programs and motion pictures to networks and stations worldwide, and also owns and operates cable television systems and broadcast stations in the United States. Working with an impressive medical advisory board, CHN has received support from the leading medical and dental associations in the country, as well as their assistance in the development of some of the programming. The goals of CHN are only a few, but those are dedicated to reaching the widest possible audience with programming which entertains and informs while motivating and inspiring viewers to lead healthy, active lives; a very large order, wouldn't you say?

These goals are:

- To be a primary source of health and science information.
- To offer programs which respond to medical and health needs of specific audiences.
- To educate our viewers to more effectively use America's health care delivery system.
- To be accurate, balanced and timely in all of our programming.
- To provide opportunities for open discussion of controversial issues.
- To be responsive to our viewers.

The **CABLE HEALTH NETWORK** is definitely something innovative and progressive, as it has ushered in a new era in communications by providing positive influences on the American populous and very importantly, on American youth, on the very thing of the most basic concern to most Americans — their own personal health. This new era is one of lifestyle diseases — disorders over which we have personal control — heart disease, hypertension, lung cancer, obesity, drug abuse, alcoholism, etc. — the list goes on and on. The approach to the dissemination of this health information will help conquer these disorders as well as those of times past with infectious and mechanical diseases. The **CABLE HEALTH NETWORK** believes that the primary weapon will be information, and to that, it is dedicated to providing.

Briefly, the **CABLE HEALTH NETWORK** delivers:

- 24 hours a day, 7 days a week
- Free to cable systems
- Advertiser-supported
- RCA Satcom III-R, Transponder 17

Keeping America Healthy..

Programming That Motivates

Useful, timely information in entertaining programs about:

- What's New in Health and Science
- Self-help and Medical Care
- Science, Nature and Technology
- Healthy Relationships
- Nutrition, Diet and Eating Well
- Keeping Fit
- Growing Up
- Getting Older, Feeling Younger
- Human Interest and Lifestyles

Accurate, Balanced And Timely Information

All programming content is approved by:

- Office of the Medical Director
 - Standards and Practices
- Scientific, medical and health care priorities will be identified by the
- Medical and Scientific Advisory Board

For more information concerning the **CABLE HEALTH NETWORK**, contact Don Andersson, Vice President/Affiliate Relations, who is responsible for the overall affiliation and coordination of marketing efforts with cable systems. For many of the CATJ readers and CCOS attendees, you will recognize Mr. Andersson as a long-time friend to our association and certainly one of the outstanding gentlemen of the cable industry. Give him a call if you have any questions. The **CABLE HEALTH NETWORK** is on the right track with their programming; ask any of their viewers and you'll get a positive and enthusiastic response!

* Independent Study Sources:

- Opinion Research Corp., 1982.
- National Sporting Goods Assoc., 1982.
- Drug Store News, 1982.
- Dep't. of Health & Human Services, 1982.
- R.H. Bruskin Asso., 1981; 1982.
- Research & Forecasts, 1982
- SRDS, Inc., 1982.
- NAD, 1981; 1982.
- A.C. Nielsen Co., 1982.
- Keleman Associates, Inc., 1982.
- The American Journal of Community Psychology

Showcase

AUTOMATION TECHNIQUES INTRODUCES ADVANCED SATELLITE RECEIVER

Automation Techniques has introduced a new low-cost satellite receiver to its line of imageless satellite receivers with added features that make it one of the most technically advanced and easiest to operate in the industry, according to ATI President Ted Anderson.



The GLR-560 features single board construction and utilizes a new digital detector for optimum performance and reliability. "This unit is designed with the end user in mind," Anderson explained. "Each new feature, especially the new digital detector, ensures that the customer will have excellent picture quality and better up front control of the unit because of the detector's sensitivity to video input." The detector has a better than 7.5 dB carrier-to-noise threshold and a 30 MHz bandwidth.

The GLR-560 also features new dual audio channels for direct or matrix stereo with improved "wide/narrow switching" that allows the user to obtain the best quality audio from either wide or narrow band audio signals with a flip of the switch. Like ATI's GLR-520 and GLR-550, the GLR-560 has pushbutton transponder selection and a front panel Relative RF signal meter for constant quality control on dish orientation and condition of satellite receiving system components.

Another new feature is a Westar/Satcom satellite polarity designation switch on the rear panel.

The GLR-560 also includes unfiltered video output for audio processors and an optional modulator with vestigial sideband filter. Additionally, the GLR-560 has a separate weatherized remote tuning module (down-converter) that can be located near the LNA. Its 70MHz output can be run through standard coax rather than expensive microwave cables.

Available in rack mount (GLR-561) or stand alone configuration, the GLR-560 also has a 5-pin DIN jack for optional remote control and an A/B switch with cables to simplify TV connection.

Automation Techniques has also announced an updated styling for its satellite receiver line in addition to adding more technical features to make the entire line more marketable, easier to operate and efficient according to ATI President Ted Anderson.



ATI's first satellite receiver, the GLR-500, has undergone the most dramatic "cosmetic" change, with its woodgrain exterior replaced with the brushed silver aluminum styling of the company's GLR-520 and GLR-560 receivers.

"We have now carried the family look throughout the entire line which not only enhances product identification, but also makes the product more 'sellable' in selected markets," Anderson said.

Anderson said that one GLR-500 now features a front panel Relative Power Meter for the users extra convenience and easier operation. The unit also has a front panel polarity switch to aid correct satellite polarity and transponder designation.

The GLR-500 still features single knob transponder tuning, variable audio, and is available in stand-alone configuration only.

The GLR-520 and GLR-560 have added the features of new single board construction and a Westar/Satcom switch on the rear panel to provide correct transponder designation. Additionally, the GLR-560 now features a digital detector for carrier-to-noise threshold less than 7.5 dB and 30 MHz bandwidth. A 5-pin DIN remote jack for the RC-550 has also been added to the GLR-520 and GLR-560.

Literature and price information are available by calling Anderson at 918-836-2584; or, writing Automation Techniques, Inc. at 1846 N. 106th E. Ave., Tulsa, Oklahoma 74116.

BLONDER TONGUE SEMINAR

February 23, 24, 25, 1983: A Blonder-Tongue MATV/CATV/TVRO Technical Seminar will be held in Phoenix, AZ in conjunction with J.R. Morgan Agency. Contact Chuck Fitzer (415) 449-0547.

COMSEARCH PROVIDING NEW SERVICE AND LPTV PROTECTION LITERATURE

Comsearch, Inc. has announced a new service of providing alternative frequency planning for the some 1500 private terrestrial microwave users who must vacate the 12.2-12.7 GHz band by 1988. Alternative frequency assignments are presented which include moving to the 2 GHz microwave spectrum for long haul traffic and to the 18 GHz or 23 GHz microwave spectrum for shorter hops.

Comsearch offers comprehensive frequency planning and interference impact analysis considering both inter-system and intrasystem effects. FCC application preparation (with engineering exhibits) and frequency protection are available from Comsearch.

Comsearch has also updated literature titled: "Interference Protection for Cable TV Systems from LPTV Stations". This literature discusses the area of concern to cable systems, reporting interferences, types of interference the final ruling, and the service that Comsearch provides to CATV operators and owners. This material is free upon request.

For more information on the above, call or write:

Jerry D. Schulman, P.E.
Comsearch, Inc.
11503 Sunrise Valley Drive
Reston, VA. 22091
(703) 620-6300

TOCOM INTRODUCES NEW ADD-ON ADDRESSABLE BASEBAND DECODER AND ADDS TO 55 CONVERTER PLUS FOR TELETEXT AND VIDEOTEX

TOCOM, Inc. has introduced a new 55 PLUS Addressable System product, the 5501A Addressable Baseband Decoder, which is a microprocessor-controlled decoder designed to adapt practically any multichannel TV converter to baseband addressable operation. The Addressable Baseband Decoder will be priced substantially below the cost of a one-way addressable converter.

"The 5501A can help cable operators lower their costs in upgrading their systems to addressability," according to Carl Weidman, Product Marketing Manager. "For a cost substantially lower than the purchase price of a full-function one-way addressable converter, the operator can add the 5501A to an existing non-addressable RF converter and achieve the security and program flexibility of baseband addressability throughout the system," he said.

The TOCOM 5501A uses the same base-

band scrambling, addressing and headend technology as the rest of the 55 PLUS family. It is addressed by data encoded in the vertical interval of the video signal for remote authorization and program control. The add-on decoder demodulates, processes and remodulates the signal for output on channel 2, 3 or 4. It uses TOCOM's proprietary Baseband Encoded Scrambling Technique (B.E.S.T.) to virtually eliminate theft of service from the system.

The 5501A is installed between an existing RF converter and the subscriber's TV set and is powered by a low-voltage plug-in transformer. The subscriber may tune to any channel authorized for delivery exactly as he did before the installation of the decoder. No additional adjustments are needed. Parental Discretion Control is available with an optional key switch.

Like the compatible 5504 one-way and 5510 two-way addressable converters, the 5501A allows the cable operator outstanding marketing flexibility by replacing tiering with a new concept called "Service Classes." This new concept allows cable operators to package channels and programs in any conceivable configuration to fit subscriber demand. Moreover, it provides pricing alternatives not possible with tiering.

In addition to Service Classes, the 55 PLUS family has a unique delivery system for pay-per-view called "Subscription Programming." Up to 256 Subscription Programs can be delivered per channel. Each subscriber's decoder or addressable converter can retain authorization from the headend to receive up to four of those subscription programs during a month. Other subscribers may choose four totally different programs.

SAW filters used in the 5501, 5504 and 5510 provide maximum protection against adjacent channel problems common to most older TV sets.

Also, TOCOM has significantly enhanced the graphics capability of its 55 PLUS two-way addressable converter for display of teletext and videotex. Graphics for the 5510 Home Information Terminal have been upgraded from 32 characters by 16 rows to a 40-character by 24-row graphics screen capability. The upgrade allows the 5510 to deliver British Standard PRESTEL format graphics in a full range of eight colors. And a new zoom enlargement feature provides magnification of each section of the screen at the viewer's command.

The 5510 is a 55 PLUS family compatible 400 MHz baseband addressable terminal with advanced capabilities that also enable it to function as a home information terminal. It decodes digital data transmitted on lines 17 and 18 of

the video vertical interval to deliver text and graphics.

When used on a single cable plant, the 5510 provides 55 video channels under programmed control from the headend. In addition to the traditional video channels, the 5510 also provides 55 teletext data channels for the display of text and graphics. Pages of text and graphics are stored in RAM memory in the 55 PLUS. The TV screen display is continuously refreshed by the video display generator so that the text page can be displayed as long as desired by the subscriber.

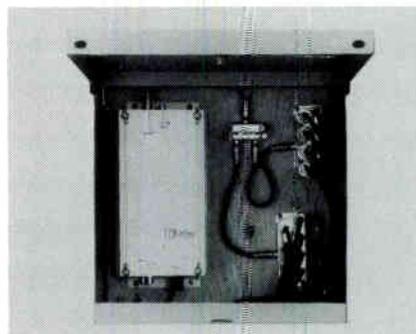
The TOCOM Home Information Terminal is fully compatible with the 5504 one-way addressable terminal and the new 5501 addressable baseband decoder and can be used in the same cable system with them to provide multiple levels of subscriber service. Delivery of the upgraded terminal is planned for spring, 1983.

For more information, contact TOCOM, at P.O. Box 47066, Dallas, Texas 75247 or call (214) 438-7691.

**ANIXTER COMMUNICATIONS
DISTRIBUTING RELIABLE
ELECTRIC/UTILITY'S
S.A.F.E.**

Anixter Communications is now stocking the S.A.F.E., a Secure Access-Free Enclosure manufactured by Reliable Electric/Utility Products, for immediate delivery in the United States and Canada. Designed to stop Pay-TV theft in apartments and residential complexes, the S.A.F.E. is manufactured of heavy gauge galvanized steel. Because the S.A.F.E.

receives the same rigid 4 stage bath painting process required for Utility Products' pedestals, it can be used in outdoor applications. The S.A.F.E. features four optional maximum security locking systems that include the SUPRA (Keyed Alike) Lock, a K-Lock, padlock hasp, or padlock sidemount.

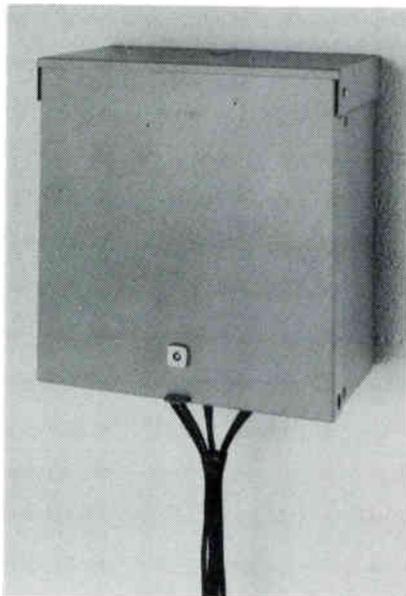


The S.A.F.E. can house amplifiers, taps, splitters, and other Cable TV equipment. Installation knockouts are positioned on top, bottom and back for cable entry and efficiency. A latching system allows the door to stay open for installation and maintenance. The S.A.F.E. is available in a variety of sizes.

The S.A.F.E. adds to Anixter's complete inventory of Cable TV products stocked throughout a nationwide on-line computer linked network of distribution centers in the U.S. and Canada. For further information call Frank Priebe collect at 312-677-2600.

**MAGNAVOX MOBILE TRAINING CENTER
1983 SCHEDULE**

Location	Dates
San Francisco, CA	01/12-14, 1983 01/17-19, 1983
Denver, CO	02/09-11, 1983 02/14-16, 1983
Phoenix, AZ	03/09-11, 1983 03/14-16, 1983
Dallas, TX	04/06-08, 1983 04/11-13, 1983
Kansas City, KS	05/04-06, 1983 05/09-11, 1983
Houston, TX	NCTA Show
Minneapolis, MN	07/13-15, 1983 07/18-20, 1983
Columbus, OH	08/10-12, 1983 08/15-17, 1983
Detroit, MI	09/14-16, 1983 09/19-21, 1983
Richmond, VA	10/12-14, 1983 10/17-19, 1983
Nashville, TN	11/02-04, 1983 11/07-09, 1983
Ft. Lauderdale, FL	12/07-09, 1983 12/12-14, 1983



Distributors	Manufacturers	Service Firms
D1—Full CATV equipment line	M1—Full CATV equipment line	S1—CATV contracting
D2—CATV antennas	M2—CATV antennas	S2—CATV construction
D3—CATV cable	M3—CATV cable	S3—CATV financing
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

Associate Roster

Note: Associates listed with * are Charter Members.

ADT Security Systems,
One World Trade Center,
92nd Fl.,
New York, NY 10048
212—558-1444
(M9 Security Equipment)

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

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

Amplica, Inc.,
950 Lawrence Dr.,
Newbury Park, CA 91320
805—498-9671
(M4)

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

Apple/Store,
Rte. #1, Box 156,
Beaver Dam, WI 53916
414—885-6249

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

Automation Techniques,
1846 N. 106th E. Ave.,
Tulsa, OK 74116
918—836-2584
(M9)

Avantek, Inc.,
481 Cottonwood Dr.,
Milpitas, CA 95035
408—946-3080
(M8, 9 TVRO
Components)

BEI
P.O. Box 937,
Olathe, KS 66061
800—255-6226
(M9 Character
Generators)

**Ben Hughes
Communications**
P.O. Box AS,
Old Saybrook, CT 06475
203—388-3559
(M6, M9)

Blonder-Tongue Labs, Inc.,
1 Jake Brown Rd.,
Old Bridge, NJ 08857
201—679-4000
(M1, 2, 4, 5)

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

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

CATEL,
4800 Patrick Henry Dr.,
Santa Clara, CA 95054
415—969-9400

* **C-COR Electronics, Inc.,**
60 Decibel Rd.,
State College, PA 16801
814—238-2461
(M1, M4, M5, S1, S2, S8)

CCS Hatfield/CATV Div.,
5707 W. Buckeye Rd.,
Phoenix, AZ 85063
201—272-3850
(M3)

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

CableBus Systems,
7869 S.W.
Nimbus Avenue,
Beaverton, OR 97005
503—543-3329
(M1)

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

Cable Health Network,
2840 Mt. Wilkinson Pkwy.
Atlanta, GA 30339
404—436-0886
(S4)

Cable-Text Instruments,
705 Avenue K, Suite #4
Plano, TX 75074
214—422-2554
(M9 Generators)

Century III Electronics, Inc.
3880 E. Eagle Drive,
Anaheim, CA 92807
630-3714
(M1, M3, M4, M5, M7, M8,
S1, S2, S8)

Capscan, Inc.,
P.O. Box 36,
Adelphia, NJ 07710
1-800—CABLETV or
222-5388
(M1, M3, M4, M5)

Channel Master,
Ellenville, NY 12428
914—647-5000
(M2, 3, 4, 5, 6, 7)

**Collins Commercial
Telecommunications,**
MP-402-101,
Dallas, TX 75207
214—690-5954
(M9, Microwave)

Comm/Scope Company,
Rt. 1, Box 199A,
Catawba, NC 28609
1-800—438-3331
(M3)

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

**Computer Video
Systems, Inc.,**
3678 W. 2105 S. Unit 2,
Salt Lake City, UT 84120
1-800—453-8822
(M9)

COMSEARCH INC.,
11503 Sunrise Valley
Drive,
Reston, VA 22091
703—620-6300
(S8, S9, Earth station
placement frequency
coordination)

ComSonics, Inc.,
P.O. Box 1106,
Harrisonburg, VA 22801
1-800—336-9681
(M8, M9, S8, S9)

DF Countryman Co.,
1821 University Ave.,
St. Paul, MN 55104
612—645-9153
(D1, S1, S8)

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

Associate Roster

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

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

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

**Eales Comm. &
Antenna Serv.,**
2904 N.W. 23rd,
Oklahoma City, OK 73107
405—946-3788
(D1, 2, 3, 4, 5, 6, 7,
S1, 2, S7, 8)

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

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

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

Elephant Industries,
P.O. Box 3949
N. Ft. Myers, FL 33903
813—995-7383
(M9)

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

**The Entertainment
Channel,**
1133 Avenue of the
Americas,
New York, NY 10036
212—930-4900
(S4)

**Ferguson Communications
Corp.,**
P.O. Drawer 1599,
Henderson, TX 75652
214—854-2405
(S1, 2, 7, 8, 9)

**Franey & Parr of Texas,
Inc., (Formerly Doherty &
Co.),**
One Turtle Creek Village,
Suite 524,
Dallas, TX
214—528-4820
(S9, Insurance)

GTE Sylvania,
10841 Pellicano Dr.,
El Paso, TX 79935
1-800—351-2345
(D7, M4, M5, M6, S4, S8)

**Gardiner Communications
Corp.,**
3506 Security St.,
Garland, TX 75042
214—348-4747
(M9 TVRO Packages, S1,
S2, S8)

General Cable Corp.,
1 Woodbridge Center,
P.O. Box 700
Woodbridge, NJ 07095
1-800—526-4385
(M3)

Gilbert Engineering Co.,
P.O. Box 23189,
Phoenix, AZ 85063
1-800—528-5567 or
602—245-1050

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

H & R Communications,
Rt. 3, Box 102G,
Pocahontas, AK 72455
1-800—643-0102
(M2, D1, S2, S3, S8)

Harris Corporation,
P.O. Box 1700,
Melbourne, FL 32901
305—724-3401
(M2, M9, S2)

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

Home Box Office, Inc.,
7839 Churchwill Way,
Suite 133, Box 63,
Dallas, TX 75251
214—387-8557
(S4)

* **Hughes Microwave
Communications Products,**
3060 W. Lomita Blvd.,
Torrance, CA 90505
213—517-6233
(M9)

* **Jerry Conn Associates,
Inc.,**
P.O. Box 444,
Chambersburg, PA 17201
1-800—233-7600
1-800—692-7370 (PA)
(D3, D4, D5, D6, D7, D8)

**KMP Computer
Services, Inc.,**
703 Central Ave.,
Los Alamos, NM 87544
505—662-5545
(S4, 5)

Karnath Corporation,
2001 Westridge,
Plano, TX 75075
214—422-7981 or 7055
(S1, 2, 8, 9)

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

**Klungness Electronic
Supply,**
P.O. Box 547,
107 Kent Street,
Iron Mountain, MI 49801
1-800—338-9292
1-800—682-7140 (Mich)
(D1, D8, S2, S8)

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

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

Lemco Tool Corporation,
Box 330A,
Cogan Station, PA 17728
1-800—233-8713
(M8, 9 Tools)

**Lindsay Specialty
Products, Ltd.,**
50 Mary Street West,
Lindsay,
Ontario, Canada K9V 4S7
705—324-2196
(M1, 2, 4, 5, 7, 9)

Magnavox CATV Division,
100 Fairgrounds Drive,
Manlius, NY 13104
1-800—448-5171 or
1-800—522-7464 (N.Y.)
(D4, 5, 7, M4, 5, 6, 7, S3, 8)

**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 Associates
Communications Co.,**
777 S. Central Expwy.,
Suite 1G,
Richardson, TX 75080
214—234-3522
(M9 Microwave Radio
Systems)

* **Microwave Filter Co.,**
6743 Kinne St., Box 103,
E. Syracuse, NY 10357
1-800—448-1666
(M5 Bandpass Filter)

Midwest Corp.,
P.O. Box 226,
Clarksburg, WV 26301
1-800—624-3845
(D1, 2, 3, 4, 5, 6, 7, 8)

Modern Cable Programs,
5000 Park St. N.,
St. Petersburg, FL 33709
(S4)

Distributors	Manufacturers	Service Firms
D1—Full CATV equipment line	M1—Full CATV equipment line	S1—CATV contracting
D2—CATV antennas	M2—CATV antennas	S2—CATV construction
D3—CATV cable	M3—CATV cable	S3—CATV financing
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

Note: Associates listed with * are Charter Members.

Mullen Communications Construction Co., Inc.,
P.O. Box 1387A,
Green Bay, WI 54305
414-468-4649
(S2)

NCS
2255-E Wyandotte Rd.,
Willow Grove, PA 19090
1-800-523-2342
1-800-492-2032 (PA)
(D1, 2, S8, 9 repair service)

National Farmers Union Property & Casualty Co.,
12025 E. 45th Ave.,
Denver, CO 80251
303-371-1760
(D9, Insurance Service)

North Supply Company,
10951 Lakeview Ave.,
Lenexa, KS 66219
1-800-255-6458
1-800-332-1073 (Kansas)
(D1, 2, 3, 4, 5, 6, 7, 8)

Oak Industries, Inc.,
Crystal Lake, IL 60014
815-459-5000
(M1, M9 Converters, S3)

Octagon Scientific, Inc.,
476 E. Brighton Ave.,
Syracuse, NY 13210
315-476-0660
(M9)

Phasecom Corp.,
6365 Arizona Circle,
Los Angeles, CA 90045
213-641-3501
(M1)

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

M/A Com Prodelin, Inc.,
P.O. Box 100
Claremont, NC 28610
704-459-9762
(M2, M3, M7, S2)

Pyramid Industries, Inc.,
P.O. Box 23169,
Phoenix, AZ 85063
1-800-528-4529
(M7, 8)

RMS Electronics,
50 Antin Place,
Bronx, NY 10462
1-800-223-8312
1-800-221-8857 (Poleline)
(M4, M5, M6, M7, M9)

Reuters,
1212 Avenue of the Americas., 16th Floor,
New York, NY 10036
212-730-2715
(D9)

Rockwell International,
M.S. 402-101,
Dallas, TX 75207
214-996-5954
(M9, Microwave/Satellite)

S.A.L. Communications, Inc.,
P.O. Box 794,
Melville, NY 11747
1-800-645-9062
(D1)

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

Scientific Atlanta, Inc.,
3845 Pleasantdale Rd.,
Atlanta, GA 30340
404-449-2000
(M1, M2, M4, M8, S1, S2, S3, S8)

Showtime Entertainment, Inc.,
1633 Broadway,
New York, NY 10019
212-708-1600
(S4)

Southern Satellite Systems, Inc.,
P.O. Box 45684,
Tulsa, OK 74145
918-481-0881
(S9)

TVC Supply Co., Inc.,
1746 E. Chocolate Ave.,
Hershey, PA 17033
717-533-4982
(D1, 2, 3, 4, 5, 6, 7, 8)

Teledac, Inc.,
1575 Taschereau Blvd.,
Longueuil,
Quebec, Canada J4K 2X8
514-651-3716
(M9 Character Generators)

Tele-Wire Supply Corp.,
122 Cutter Mill Rd.,
Great Neck, NY 11021
1-800-325-4868
(D1, 2, 3, 5, 6, 7, 8, 9)

* **Texscan Corp.**,
2446 N. Shadeland Ave.,
Indianapolis, IN 46219
1-800-528-4066
(M8 Bandpass Filters)

* **Theta-Com CATV**,
2960 Grand Avenue,
Phoenix, AZ 85061
602-252-5021
(M1, M4, M5, M7, M8)

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

Tocom, Inc.,
P.O. Box 47066,
Dallas, TX 75247
214-438-7691
(M1, M4, M5, Converters)

* **Toner Cable Equipment, Inc.**,
969 Horsham Rd.,
Horsham, PA 19044
1-800-523-5947
In Penna. 1-800-492-2512
also 1-800-523-5947 (PA)
(D2, D3, D4, D5, D6, D7)

Triple Crown Electronics, Inc.,
4560 Fieldgate Dr.,
Mississauga, Ontario,
Canada L4W 3W6
416-629-1111
Telex 06-960-456
(M4, M8)

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

Tyton Corp.,
P.O. Box 23055,
Milwaukee, WI 53223
414-355-1130
(M6, 7)

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

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

Video Data Systems,
40 Oser Avenue,
Hauppauge, NY 11787
516-231-4400
(M9)

Viewstar, Inc.,
705 Progress Ave.,
Unite 53,
Scarborough,
Ontario, Canada M1H 2X1
416-439-3170
(M9 Cable Converter)

Vitek Electronics, Inc.,
4 Gladys Court,
Edison, NJ 08817
201-287-3200

Warner Amex Satellite Entertainment Corporation,
1211 Avenue of the Americas,
New York, NY 10036
212-944-4250
(S4)

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

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

Western Communication Service,
Box 347,
San Angelo, TX 76901
915-655-6262/653-3363
(M2, Towers)

Winegard Company,
3000 Kirkwood Street,
Burlington, IA 52601
1-800-523-2529
(M1, M2, M3, M4, M5, M7) □

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4209 N.W. 23rd
Suite 106
Okla. City, OK 73107

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The National Committee for Prevention of Child Abuse is a private, charitable organization. In the last seven years we've made great strides in the prevention of child abuse.

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Help us get to the heart of the problem.

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