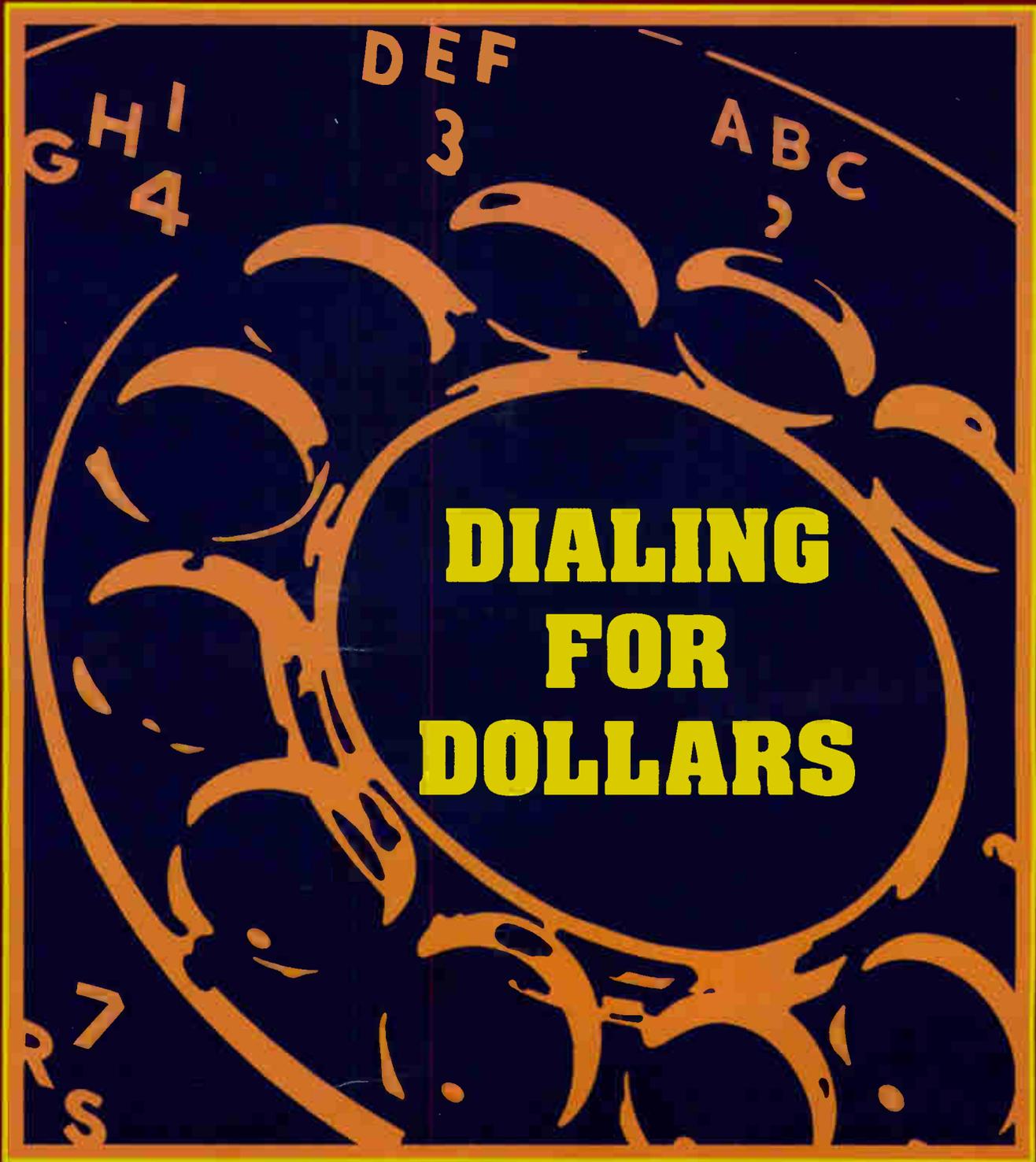


# CATJ

OFFICIAL JOURNAL OF THE COMMUNITY ANTENNA TELEVISION ASSOCIATION  
OCTOBER 1984

A DECADE OF PROGRESS **cata**





## A condominium is only as good as the amplifier that feeds it

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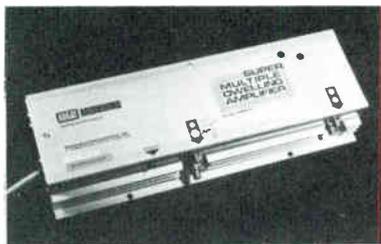
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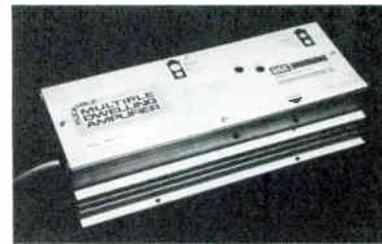
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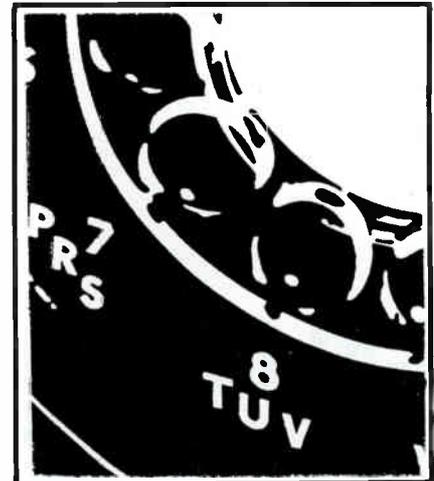
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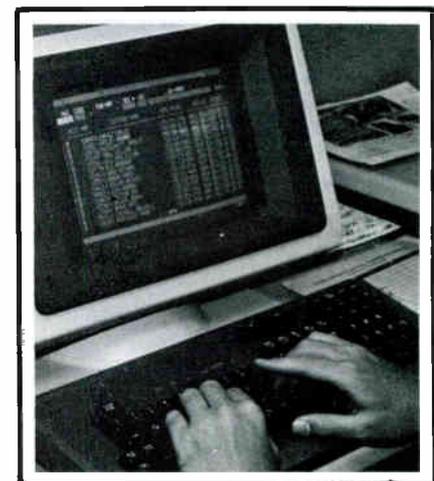
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#### ABOUT THE COVER

The telephone and its dial plays an integral part in our daily lives, and the October cover features a telephone dial to highlight two of our feature articles contained in this issue. The telephone dial — our connection with our customers, suppliers, friends, family — the ultimate in communication.

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# catatorial

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## Cable's Answer To The "VCR Challenge": WE DELIVER!

---

by Carl Schamauder  
CATA President

**I**t's almost impossible to pick up any newspaper or magazine focusing on the cable television industry these days without seeing an article or three about the impending competitive challenge to the industry by video tape recorders, and tape sales and rentals. We all know by now that by the

year 1990 it is estimated that there will be more VCRs in people's homes than there are cable subscribers — I wouldn't be surprised if that didn't happen even sooner.

We also know that video tape sales and especially video tape rental of movies has absolutely taken off — there are tape rental stores on just about every corner these days, and the drugstores and the supermarkets are starting to move in as well. The fact that it is obvious there will soon be a shakeout in that industry is a story for another day. For now, let's just concede that it is very convenient to be able to see a movie when you want to see it at a price that is extremely competitive with just about any other entertainment delivery mode.

Yes, many homes will have video tape recorders. And yes, lots of folks like the idea of having control over their television viewing. After all, it is the ultimate in convenience to be able to stop the movie any time you want for an "intermission" and then come back not having missed a word of it! But does that mean that cable is in trouble? Does it mean everyone is going to drop their premium cable subscription in favor of driving down to the local tape rental emporium each afternoon and then be sure to get the tape back within twenty-four hours so they don't get charged for an extra day? Of course not. From my point of view what it means is that cable has a great opportunity to take advantage of the sensible habits of our subscribers — they want to see movies. They want to use their video tape recorders to control time diversity, and they DON'T want to have to pick up tapes at some store every time they are interested in seeing a film! Let's face it — we have the best (and one of the oldest) sales slogans going for us — WE DELIVER!

I see the "VCR Revolution" as very invigorating for the cable industry. Rather than viewing it as a threat, I see it as an opportunity, and I suggest that you look at it that way too. Some studies recently completed on this subject seem to back up my seat-of-the-pants reaction to this whole new dimension in viewer/video interaction. Some cable companies were sufficiently concerned about the entire VCR situation that they commissioned studies to see exactly what was going on. The results are just now starting to come in. First of all, folks who have VCR's are not automatically those who then drop their "pay" channels. As a matter of fact, a high percentage of pay channel subscribers interviewed feel that the VCR enhances

their enjoyment of the pay channel — why? Because now they don't have to get home by a given time on a given night to see the movie they want to see. They can tape it and watch it at their leisure. The "intermission" capability comes into the equation here too.

There are now cable companies, such as Media General in Fairfax, Va., with a new, ultra-modern system on line that have the capability of full addressability. With that marketing tool, combined with an enlightened approach to pay-per-view, the company is offering first run pictures repeated throughout the day on a particular PPV channel. The subscriber only pays for the one time his set (with VCR) "tunes in" and "watches" the movie. Of course the multiple showings also aid the folks who just want to watch the movie at some time other than 8:30 or 9:00 in the evening, but for VCR owners, it is ideal since the machine can be set to record the movie at any time during the day, thus not interfering with other potential uses during the day.

The bottom line in the situation just described is that the cable company can truly advertise that "WE DELIVER" since subscribers can get the tape at home and then view it whenever they wish — a far more convenient approach than renting the tape, rushing home, viewing it the same night, etc.

Do you have to have a super addressable system to accomplish the same thing in your community? Of course not. If you are already providing your subscribers the option of a "pay" channel then you can legitimately start advertising that you, too, deliver. One way to make it even easier for your subscribers is to offer additional hook-ups, at low or no fee for the VCR. That is the type of service that will win you satisfied customers for many years to come.

The point here is a simple one; what some folks view as a serious challenge to the cable industry can easily be converted into a new sales and customer retention opportunity. It's just the way you look at it. □

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# INCREASE COST-EFFECTIVENESS OF PAY-TV TRAPS AND FILTERS

By: Terry Owens  
Glyn Bostick

MICROWAVE FILTER COMPANY, INC.

**NOTE:**

*This time we were to give results of trap RF leakage tests, using the equipment discussed in the last installment*

*(CATJ September). Alas, am still in the middle of testing, due to some late sample arrivals. Catch you up on leakage next time.*

**Make sure they'll do the job — before you install them**

### SUMMARY

Simple tests on just a few traps predict success (or failure) of large production lots, before they're installed. The result of adopting correct sampling techniques will be to reduce theft of services drastically and to increase sign-up of trapped subscribers. Some trap performance specifications and corresponding test methods are proposed — for use by the factory or the system engineer.

### THE NEED FOR INDUSTRY-WIDE TRAP PERFORMANCE STANDARDS

Pay TV security is expensive: in 1983, CATV systems spent over \$40 million on video traps alone.<sup>1</sup> Hit that with a multiplier

for installation costs. To be justified, this outlay must produce at least as much revenue. Traps of poor or unknown quality don't encourage premium sign-up of the trapped subscriber and it's hopeless to cure this condition after installation. Therefore, meaningful, pre-installation sampling is indicated. But sample what? And how?

The short, ten-year history of trapping hasn't yet produced a universally accepted performance specification responding to realistic service conditions. Theoretically, the requirements for a cost-effective trap are simple: it must last several years while performing its intended function well — wiping out the picture. Universally accepted performance specifications, and corresponding test methods, would assure a ready supply of acceptable traps from alternate sources and would create a clear criteria for rejecting unacceptable shipments. It's probably too early to expect this to happen. So here we

propose some sensible performance specifications and suggest how the typical CATV system can test economically. The results: an accurate prediction of trapping effectiveness, before installation.

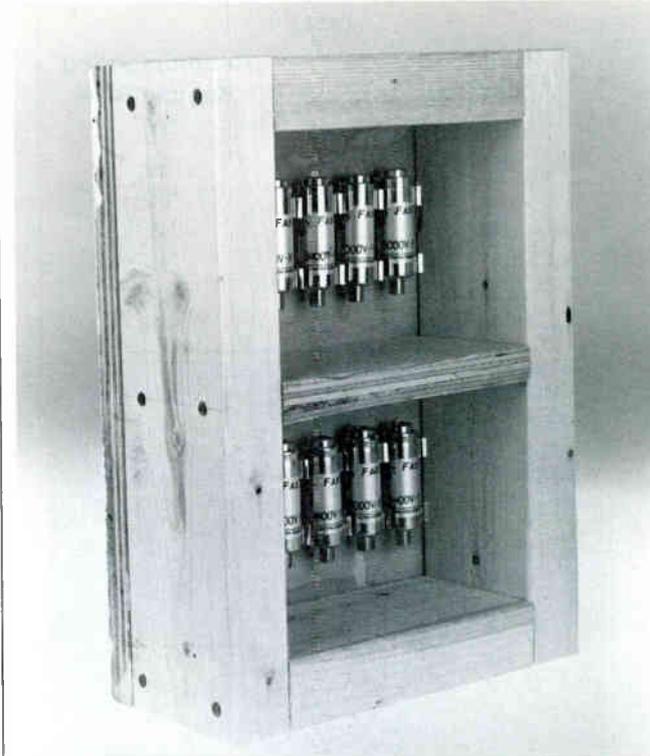
### WHAT TO TEST AND HOW TO DO IT

**Picture Wipe-out:** We want to be sure the trap performs this prime function under all the significant conditions likely to occur in our specific system. So, the appropriate tests are purely mechanical ones, reasonably simulating our location conditions, in conjunction with trapping effectiveness.

**Moisture Ingress to the Trap** is our most devastating environment factor: resonant circuits just do not function when wet (even a little bit). The popular "water immersion" test leaves much to be desired. Depending on the encapsulating material (if any), it may take days for moisture to work its way to the circuit



Trap moisture ingress test. At least 50 PSI of forced air is recommended. Trap should be under water. No bubbles should be allowed.



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

elements. Forced air will find the opening immediately — and create visible bubbles (see Photo 1). So use it for a **quick, reliable** test of what will happen in the field.

**Shock** tends to detune sharply resonant circuits which depend on their physical shape, and proximity to other elements, for proper operation. The amount of shock required depends on how well the circuit elements are cushioned (encapsulated) to stay in or return to their original positions. The popular “15 foot drop onto a hardtop” is not very useful. If you dent the connector threads, you couldn’t use the trap anyway. You just want the circuit to stay put under the level of shock it’s likely to get in your system, such as shake-up in shipping, bumping around in the installation van or knocking against the pole in the wind. See the Photo #2 for a sensible, non-destructive test fixture. Then, drop it, say, 4 feet (but 15 foot, if you insist).

**Temperature swings** can uncover the picture, in the case of unstable traps. So the trapping

function should be tested at the temperature extremes **normal** for your location. A sensible specification seems to be about  $-30^{\circ}\text{F}$  to  $+120^{\circ}\text{F}$ , which covers the vast majority of locations in the USA. There may be some rare exceptions. But we must stop somewhere if the designer is to produce an **affordable** trap. (Hawaiian systems would surely bridle at the price of a  $-70^{\circ}\text{F}$  to  $+200^{\circ}\text{F}$  trap!). The test should include cycling between hot and cold several times (6 recommended) to simulate several seasonal changes. Test trapping before you begin and again on the last “Hot” and “Cold”.

**Mechanical Ruggedness** is needed to withstand normal wrench torque on connectors and axial pull due to tugs on the drop line. It only requires about 15 inch-pounds of torque to fully tighten an F59 nut. So why not test samples with a torque wrench calibrated at, say 30 inch-pounds, for safety (see Photo 3). A 75 pound yank on the drop line will probably wreck the tap anyway.

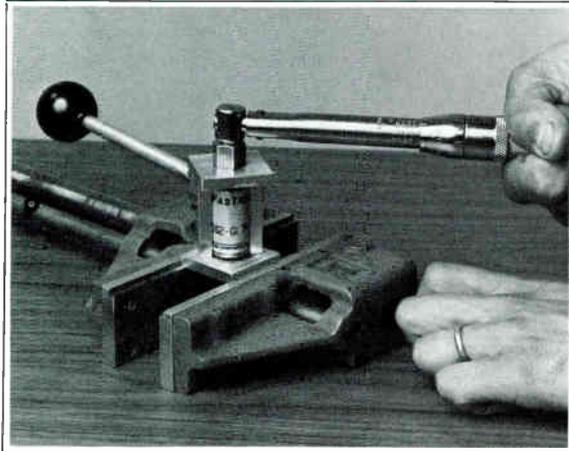
So why insist that the trap take more? How about testing with a 75 pound weight (see Photo 4).

#### HOW MUCH TESTING IS ENOUGH?

The only way to be **absolutely** sure you never put a bad trap out on the line is **not affordable**: test **each** trap for **each** of its characteristics. For thousands of traps, this is a lot of testing and escalates the **real** cost of traps. Correctly testing a few truly representative samples can predict your percentage field failures very closely. Then you can make a value judgement. Our defense establishment consumes over 50% of the electronic products produced in the USA and has developed procurement sampling procedures which accurately predict the failure rate of large production lots, by testing only a few samples. Table 1 shows a sampling schedule from a representative (and usable) table from MIL-STD-105.<sup>2</sup> It can be seen that the sample batch is proportional to the **square root** of the production lot size — not

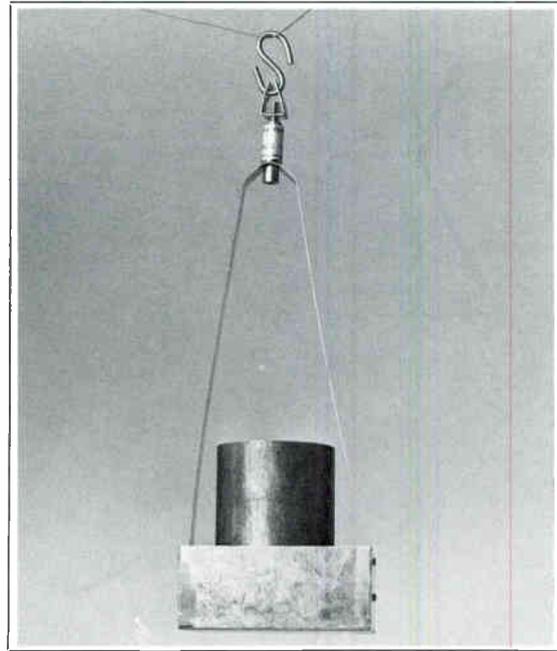
TABLE 1

Production Lot Size	Recommended Sample Size
16-150	13
151-500	50
501-1,200	80
1,201-3,200	125
3,201-10,000	200
10,001-35,000	375
35,001-150,000	500



Use a calibrated torque wrench to check torque withstanding of connectors. 15 in-pounds is sufficient to fully tighten an F59 unit. Recommended test is 30 inch-pounds.

▼ Simple pull-apart test. 75# weight recommended.



directly proportional to it. So it is never necessary to test a large **percentage**. You may get a copy of MIL-STD-105 and pursue it in spades, if you like. But, in the following section, we will sensibly depart from its detailed practices, while observing its principles. After all, a plane is not going to crash if just **one** of your traps malfunctions!

### SUGGESTED PROCEDURE

Only **representative, random** samples lead to valid conclusions. The lot which you sample must consist of units of production produced under the same circumstances: produced at the same time, using the same batch of components and put together with the same workmanship. In a large continuous production order, this can vary from shipment to shipment. So, if you are receiving traps in a series of shipments, sample each shipment. After testing the samples, count up all the **failures**: if a given trap fails **two** different characteristics, count **two** failures. Divide the total failures by

the number of traps tested. This will somewhat overstate the percentage of field failures. Are you willing to install a batch with this **percentage** of failures? If not, you have three alternatives, in the order of **least added cost** to you:

1. Document your test results and return the entire lot to the manufacturer with a request that he cull and return them. Be sure to retest. If the second test shows acceptable improvement, install. If not, make final return and procure elsewhere: either (a) he can't test the failed characteristics, (b) he can't do better (c) he doesn't care.
2. Make a second, random sampling, combine results with the first and refigure. This action is indicated if the results of the first sample test was just under your acceptance criteria. If no improvement, go back to (1).
3. If you really must install now, devise a rapid test for the **failed** (or most failed) characteristic and cull the entire production lot. Subtract fail-

ures for this characteristic, in your sample test, and refigure. Return the culls for credit.

### NEXT TIME

Honest-to-gosh, we **will** present the results of RF leakage test performed on a cross section of traps from the industry.

### ACKNOWLEDGEMENTS

Thanks to: Carol Ryan — for editing away the egg on my face, Chris Bostick — for his COOK sketch, Dave Skeval and Steve McIntosh for photographs, Jack Gaffield — for the water test apparatus, Bill Buck — for the drop test fixture, and George Slack — for the torque and pull set-ups.

### FOOTNOTES:

<sup>1</sup>CABLE TV TECHNOLOGY, Paul Kagan Associates, Vol. 68, March 27, 1984.

<sup>2</sup>MIL-STD-105 Details production lot sampling procedures. You can get a copy from the local U.S. Government "DECASO" office — which inspects local vendors on government production contracts. □

# CHANNELIZER

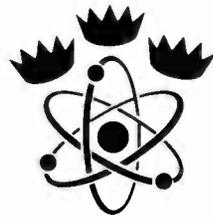
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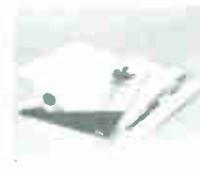
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recognized him as a good prospect to present a weekly high school news show. Jeff recommended a format, but he says the young student "did all the work of finding news, getting people on for interviews and, in general created an interesting program. We were quite proud of his achievement and I mentioned it to Senator Fred Harris during a conference. He was impressed and inserted a story about it in the Congressional Record."

During his youth, Jeff had been in high school plays, the band, instrumental ensembles and had entered many contests playing trombone solos; performing was not foreign to

him, so stepping in and putting on local shows came almost naturally. "We did a weekly show which included some local news, video tapes of trips to the lake, and trips to just about every place we went," he says. "These programs were well received and added enjoyment to the lives of many of our customers who were unable to make such trips themselves. We got a lot of positive comment from them. The shows always ended with playing three games of bingo and cash prizes were awarded to the winners. People would phone our office number when they had a bingo and we checked it there while on camera. It is amazing the

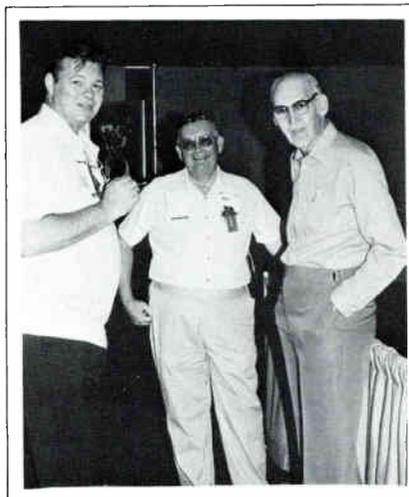
number of unexpected complications which can arise during this kind of program. It called for some fast thinking at times, but basically it was a lot of fun and did help us grow at a time when we desperately needed it."



*Lila Krumme in a familiar setting at the typewriter in the Krumme's cable office; admittedly, Lila was the office management for many years.*



*Carl Schmauder and Wayne Sheldon are enjoying their visit with the Krumme's son-in-law, Terry Shutts, who has been a regular at CCOS and at Ralph Haimowitz' technical seminar.*



*Ralph Haimowitz, CATA Director of Engineering, G.H. Dodson, CATA/and CATJ Founder, visit with Jeff on the exhibit floor at CCOS '84.*

During his years in the business, Jeff has been an active association man, and is past president of the Oklahoma Cable TV Association, (he proudly displays his plaque and gavel) and was on the association board for several years. He is also past president of Mid America Cable TV Association and has served on that board of directors for about eight years.

Jeff is one of CATA's first members. He says, "I was well acquainted with Kyle Moore because we were both in the Oklahoma Association. Most of that group joined CATA as soon as membership was available. I'm proud to be with (this) truly unique group." He

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*A familiar sight — Lila and Jeff Krumme visiting with fellow cable system operators on an exhibit floor at one of the cable trade association meetings.*



*(Above left) Jeff with son, Paul Krumme, at a construction sight. (Above right) Also assisting Jeff on construction was Paul Trammel. (Below left) Lila Krumme had the pleasure (?) of handling the bingo games over the cable system. (Below right) Jeff dealt with laser holography at North American Rockwell as part of his responsibilities.*

says that CATA is the only representation for small operators, and its membership and staff must not forget its origins. "We should work with other groups to achieve our common goals as much as possible. Compromise is the main thing Washington understands. It is OK within reason, but some things must not be compromised. The 'quick fix' too often is not a fix. The same issues return to haunt us."

As a long time CATA supporter, he is the proud owner of one of the limited edition posters which helped to raise funds for the Gridley case, "Hiding the Headend Underground Didn't Fool Them, Kyle."

One of the biggest problems facing the cable industry he says, "is the apathy of too many system operators and managers." An outspoken man with strong convictions and boundless energy, he believes it is a matter of survival for system operators and managers to expand their horizons and become actively involved in cable associations in order to stay current with what is happening in the industry, particularly in the area of regulation and legislation. During his many years of active participation in cable associations he was often distressed to notice some "operating their systems like they were on an island, totally unconcerned that Washington was getting ready to do something to them." Instead of getting to know their congressman and senators and working for favorable legislation, they are looking for ways to cut their budgets by staying out of associations or

minimizing their dues by enrolling only the smallest of their several systems, "so they can have all the privileges members do, without spending any money. This is the kind of thing that allowed many groups to do us in," he says.

On the surface Jeff appears to be a simple man, but he is, in fact, a very complex person with high intelligence and a multitude of interests. He enjoys many of life's ordinary pleasures such as travel, nature and good health; yet he grasps and understands complicated ideas and likes to tackle complex issues.

He says, "Basically I prefer a peaceful environment where I can pursue my interests, but find myself continually engaged in controversy because someone is trying to pass laws which favor their group against others. Cable TV is an example. I get irritated with people who will do nothing to defend their interests. The World War II motto, 'Eternal vigilance is the price of freedom' is a fact of life. I believe in freedom."

He was born in Tuskegee, Oklahoma, where his father "operated a general merchandise country store, a cotton gin and 2,000 acres which he leased from a rather well to do Indian" according to Jeff. "I learned to drive a Model T car at about seven or eight years of age in the hayfields. When I got to be 14, I couldn't understand the highway patrol not wanting me to drive a car in and around Bristow where we then lived. I'd been driving for years by then, (as) no license (was) needed in the hay field or around Tuskegee."

Jeff says that he met his wife Lila "by plan. I had been struck by her beauty when I first saw

her. I was in the eighth grade." Today they have two grown children and four grandchildren. Their daughter, Karen, and her husband, Terry, are the parents of seven year old Terry and four year old Suzanne. Their son, Paul, and his wife Lagenia, also have two children, Kristy Leigh, who is seven, and Cliff, who is four. Paul is in the real estate investment business with Jeff, so the entire family is closely involved with shared business enterprises as well as family activities.

As a youngster, Jeff was always a part of his own parents' business enterprises. He says, "I really grew up in business. The entire family helped out in the store or whatever my father and mother were running. I learned many

good business practices and principles from them. I also learned that no man is the same as his father, nor does he need to be. I'm grateful for having been blessed with good and loving parents."

After serving three years in the United States Army (Eighth Armored Division) during World War II, Jeff joined his father in an automobile, truck, tractor, and farm equipment dealership. During the early 1950's, he and his father owned and operated a cotton gin north of Plainview, Texas. Jeff adds, "During this time the children were small and I bought a combine and truck and made two wheat harvests — Texas to Montana."

Jeff says, "I think a lot of people, when they pass thirty, start appraising, (asking

August, 1984

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themselves) am I really doing what I want to do? It looks like just one time around." At this point in his life he decided to go to college, and he earned a Bachelor of Science Degree, then a Master of Science Degree, and eventually a PhD in Physics with research on semiconducting diamond.

He went to work in the

power structure first hand and saw the Peter Principle in action. After a number of years he decided to leave because he says, "We each only have a certain number of hours on earth, and I didn't want to wind up spending hours doing things only because somebody felt insecure, (things) that had no particular pertinence to

behind the lines for the big battle that lay ahead. Jeff says, "I began to have sleepless nights when I got into cable. I can't recall the time ... that there hasn't been some gigantic problem, and in many cases three or four of them, nipping at our financial goals, caused by some group or somebody who was wanting to do us in for their own commercial interests."

He says, "The thing that happened - our industry grew up (due to) a whole bunch of entrepreneurs that were willing to gamble, willing to work hard and willing to go out there and learn a business and provide a service, but the regulators and the big commercial interests wouldn't leave us alone. We get along great with our customers, generally speaking they get along with us, and we're out there doing a service that they undoubtedly feel is worthwhile, but along come these people who don't know what we do, It still staggers me to talk to the people in Congress who think they know about cable, but if you get very explicit at all with them, you find out quickly that they don't know what it is. The FCC, right now in 1984, is regulating us as though we were a big wealthy broadcaster... They think we all have Washington law firms, but that's not the nature of cable TV... We are not broadcasters. We don't use the public spectrum. In fact, they passed rules to be sure we don't do that. So, since we are not using any public domain, then why have all this regulation on us?"

He offers several suggestions for what cable people can do to



*Following his doctorate in Physics, Jeff spent many years with various aviation firms and is shown in his research office at North American Aviation, 1968.*

aerospace industry, "working in a company that had assembled an incredible amount of talent," he says. "I could work with virtually dozens of fellow scientists." His work included laser holography and electromagnetic signature studies. Coming from a small business background, Jeff found that while he liked the work, from the political standpoint, the big company environment was stifling. He says he learned about the

achieving any goals. If I wound up wasting time, I wanted it to be because I wasn't smart enough to figure out how not to waste my time. ...I guess that's the main reason I decided to get back into small business."

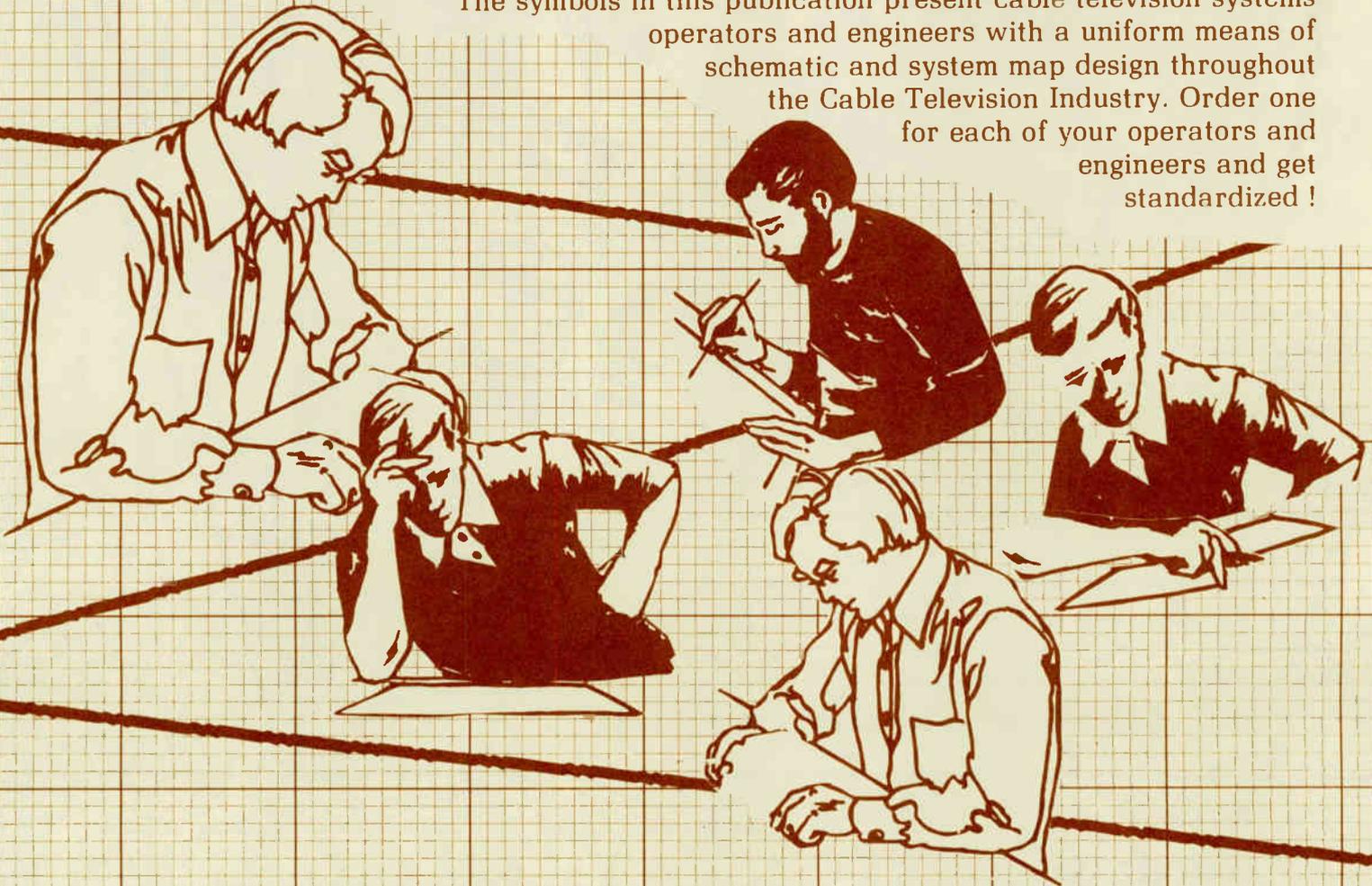
That decision eventually led him to cable television. Jeff laughs and says that Kyle Moore likes to rib him about getting into cable because he thought he would become rich. As it turned out, his earlier experiences were just training

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help themselves. For starters, they should leave their comfortable offices and support cable associations with both their time and their money. Some don't even realize how much the associations are doing for them, and Jeff emphasizes that there is a need for both national and regional associations. The Board of Directors of the Mid-America Association spent hours going through HR 4103, line by line, in order to understand its implications and long range effects on the industry, and concluded that it was definitely not a favorable bill, that it contained too many features which simply were not acceptable, even though the two national associations were recommending support at that time. The Mid-America Board urged their members who were employed by big companies to contact their home office or someone in the organization who would pay attention, and try to get them to read the bill for themselves. Jeff says, "This is not a cable bill; it's an outrage. We're far better off not to have any legislation than to have 4103."

"The trouble comes about," he says, "because we all hire ourselves a lawyer, because Washington has set us up that way. You know, long before any of us alive today were born, the legal fraternity was passing laws and getting things set up so that you had to have (attorneys.) ...The mistake we make is having our attorneys do all of our negotiating, because regardless of what a marvelous talent and marvelous capabilities and marvelous charm (they have) they've never run a cable system, they've never made a

house drop. ...As we sat there at the Mid-America board meeting, reading (4103) it was clear that (our Washington negotiators) did not recognize some things which would be serious problems to many cable operators. Consider the whole regulatory environment. We have an FCC passing rules and regulations, and they don't really understand what cable is. Most of them think of it as broadcast - except that they passed rules to be very certain that we are not broadcasters. They can't drop some old concepts. So we really live in a very strange world, and unfortunately many cable operators won't pay enough attention to what's going on."

Jeff says there is a serious need for more interaction

between cable operators and the people in Washington D.C. Leaving it all up to the industry's representatives in the capital will lead to trouble. If Congressional Committees and other Congressmen only talk to Association Attorneys, Executive Directors and Presidents of a few Major MSO's, they will fail to sense the view and wishes of the public. System personnel, those who work for MSOs, as well as as owners and operators of small systems have direct contact with the public and need to communicate this knowledge. They should spend some of their money and time to be aware of what is going on and not assume that the cable associations can or will take care of everything. They should

July, 1984

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be talking to the associations' staffs, the FCC staff and the legislators. The contact has to be initiated by these people. They are the ones who are in personal contact with the public, who know what is reasonable for a system operation, and who face the anger of the subscribers if adverse regulation causes cable rates to increase. The "must carry" for multichannel sound now being considered by the FCC may well cause a significant reinvestment for cable operators which will require such rate increases.

This is another outrage says Jeff. "Once again...the FCC is considering taking our property away from us and making us spend some of our hard earned money to buy different equipment for our systems so that subscribers will receive certain signals which their TV sets are not going to convert anyway. Why is it that they're doing this? To satisfy the private commercial interests of another business group. There is no evidence that it's in the public interest. I point out that the FCC virtually never talks to the public. They talk to Association people, Company Presidents, the Washington Legal Fraternity, various people promoting some new technology, Broadcasters, and their own FCC staff lawyers, but they fail to talk to the general public. We need every cable operator in the country to file on this MTS inquiry."

On the local level Jeff says that the operator is in an excellent position to lobby their town through their regular mailings and with the use of a character generator and advertising avails. Just by

letting subscribers know what is going on, they can generate local support for both national and local rulings, especially those which effect the channels available and the rates charged. Operators "have to allocate some small part of their lives to doing something to help their career industry," he says. "Once in a while you find a manager of some MSO cable system saying, 'Why should I take money out of my pocket to contribute to somebody's campaign?' Well, if you live in this country and your career is in cable you should help elect good men to office who will give you a fair hearing. It's not just your company's responsibility. Unfair cable legislation hurts employer and employee alike."

Jeff lives what he preaches and is in frequent contact with Mike Synar, Oklahoma representative, who was among those who recently introduced H.R. 6164, a copyright bill which would grant two exceptions to the 3.75% rate for independent distant signals. Congressman Synar is on both the House Judiciary Committee and the House Energy and Commerce Committee.

"Any business deal that's not good for both sides is not really a good deal," says Jeff. This is particularly true in the agreements between cable operators and program suppliers. "It seems to me," says Jeff, "That we all need to back off a little bit, take a deep breath and ask where are we, where are we headed? ...I remember when I really needed something else to put on my system, ...and how thrilled I was when I realized that Ted Turner was putting on something that was different,

and that Showtime and HBO and (all the others) were getting on the satellite."

Satellite programming was good news for cable operators. New services meant money in the operators' pockets.

Jeff says, "Now we've reached the shake out time where a lot of foolish people have gone on the satellites and lost money...because they didn't really appraise what the situation was and...other programmers are going off because they can't make it.

The program suppliers need cable operators and vice versa. If cable companies choose to boycott some programmers over rate increases, soon there will be less of them. On the other hand, if the rate structures are inequitable, the number of cable companies will decrease.

"Both sides need to be a little more friendly toward each other, not either side pick up all the marbles," says Jeff. Some of the suppliers are so geared to traditional economics that they look at a big purchaser as worthy of less cost for their product. I guess it probably got started because they could send one salesman to one office to capture an awful lot of business. Looking at it in the short term, green eye shade type view, it didn't cost much to make the sale. ...The alternative of that is that you charge so much to the little operator that you put him out of business. You make him feel like the environment's unfriendly, (so he) sells out to the big operator who has all the benefits already, Ultimately the supplier puts all the cable systems into the hands of the one company who survives all of the take overs."

At this point the supplier would have only one customer who, for any one of several reasons, may no longer need the programmer.

Jeff says that he would like to see "The suppliers trying to be more friendly to the little operators and help them stay in business, too. We all need to recognize that we need each other, and that the enemy is *out there*. We don't want to be like Pogo and say I finally met the enemy and it is me. We don't want to put more and more (programmers) out of business, and they shouldn't want to put more and more small operators out of business by charging them more than they're charging someone else."

When Jeff is not working, thinking, sleeping cable problems, he is working, thinking and sleeping computer software. This is an outgrowth of his natural ability for problem solving. He taught himself Assembly Language which is the basis of the fastest programs obtainable and is developing programs for use in his cable operation, and, later, for other businesses. He hopes to offer complete systems for lease.

He is always alert to possible new business ventures, and in

addition to the cable systems and the real estate investment business, he has a number of other business interests. He and his wife, Lila, are beginning a management company to operate their investment activity. For years Lila worked with him in running the cable business and she sold real estate, thus finding an outlet for her enthusiasm for and interest in houses.

If he can ever put the cable industry problems aside, Jeff would like to travel in the United States on land and water, making film or tape records of the things he sees. "If it turns out that I can syndicate them, that would be the frosting on the cake," he says. The last vacation he and Lila took was driving in the Colorado mountains, fixing meals by the roadside and enjoying nature. This is an adventure he is anxious to repeat. Jeff values his health, saying, "It's not as good as it once was, but I'm grateful that I can see the beautiful world we live in, hear the beautiful music we have and the delightful sound of the voices of people I love."

Jeff often has insight into the importance of the service he

provides, but he recalls one, in particular which happened several years ago. He says, "An eighty-four year old lady made me realize the importance of our service to some of the elderly. We had one of Herschel Tyler's Weather Scan units on Channel 3 with the dials moving back and forth across the screen. One day this lady commented to me that she would often waken at 2:00 to 4:00 in the morning with nothing to do and no company except a little pet dog. She said she turned the TV to Channel 3 and the movement of the weather instruments across the screen and the (background) music helped her not to feel so alone, and that it meant a lot to her. This was a revealing look at the lives of some of our elderly and made me feel that all the hard work is worthwhile. She brightened my life with that remark, and, though she passed on several years ago, I still remember her quite well and, of course, with happiness." □

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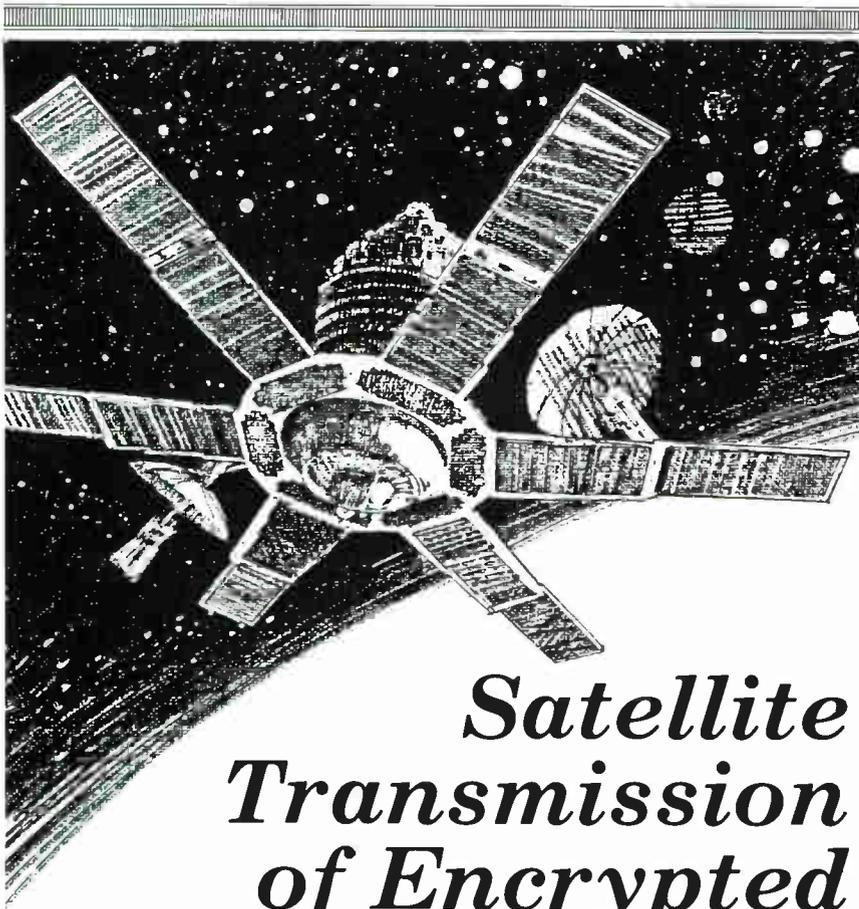
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# Satellite Transmission of Encrypted Video

by Karl Poirier  
Vice-President of Engineering  
Triple Crown Electronics, Inc.  
Mississauga, Ontario

## ABSTRACT

In the near future, all valuable television material will be secured. The present and proposed systems of hybrid scramble/encryption will place significant new demands on the satellite link. The nature of television signals which have been significantly altered by scrambling require that both the transmitter and receiver equipment undergo major modifications. Many of the required changes involve the transport of data, while others involve the transport of video without several key components. This transition can be accomplished smoothly if we are aware of the potential hazards and are

prepared to learn some new engineering techniques.

## INTRODUCTION

The scrambling, encryption, or other protection of satellite delivered television is a relatively new aspect of this industry. This trend was accelerated by the proliferation of private TVRO systems, but is not specifically directed at this element. In fact, the protection of satellite transmissions is brought about for a variety of reasons. The basis for protection, in most cases, determines the level of protection required, which can be anything from soft, to ultra hard security.

Some of the protection requirements are:-

### \* Protection of content

If a major purchaser of programming material, such as HBO, can guarantee a secure system, the potential to obtain previously unavailable markets can be realized. A movie channel could compete directly with theatres for **first run** releases rather than only second run products as is the present case. Potential pay per view (such as Superbowl games, etc.) product would also become available.

### \* Regional Diversity

Television access to program material (Sports in particular) has always been faced with blackout or simulcast restrictions. With TVRO's available in most hotels and taverns, scrambled transmission capability is vital in order to acquire distribution rights to sports events. This regional diversity is also affected by network simulcast deletion requirements when local feeds are telecast nationwide (Cancom).

### \* Subscriber Control

The ability to de-authorize a decoder is the ultimate weapon against delinquent accounts. It is the only way the DBS operator has to secure his revenue base.

### \* Program Content

Some program material is scrambled merely to separate it from normal satellite broadcast. Signals such as unassembled news feeds, network housekeeping feeds etc., are scrambled merely to discourage complaints over the program content or quality.

The program originator, depending on his requirement, must now balance the level of protection he requires against system cost and complexity. This decision is most greatly affected by the number of authorized reception sites to be provided with equipment to defeat the security.

It is this requirement of security level vs. system cost which determines whether an operator decides to employ scrambling, or encryption/scramble hybrid.

### SCRAMBLING VS. ENCRYPTION

Although the industry tends to describe any form of security

as scrambling, there is a very distinct difference between scrambling and encrypting.

#### Scrambling

In generally accepted terms, scrambling means to render the information useless unless it is processed by an appropriate descrambler. This usually involves

- 1) a non standard transmission format (inverted polarity, odd frequency etc.),
- 2) removal of some critical part (sync, timing),
- or
- 3) addition of some interfering information.

All scrambling methods have two common attributes:

- a) The information portion of the signal is *relatively unchanged* with the exception of that portion removed or added.
- b) The ability to descramble the information is contained *in the descrambler*, with control being the ability to tell the descrambler *when (not how!)* to decode.

Common scrambling methods include:

- \* the use of non-standard fre-

FIGURE 1A

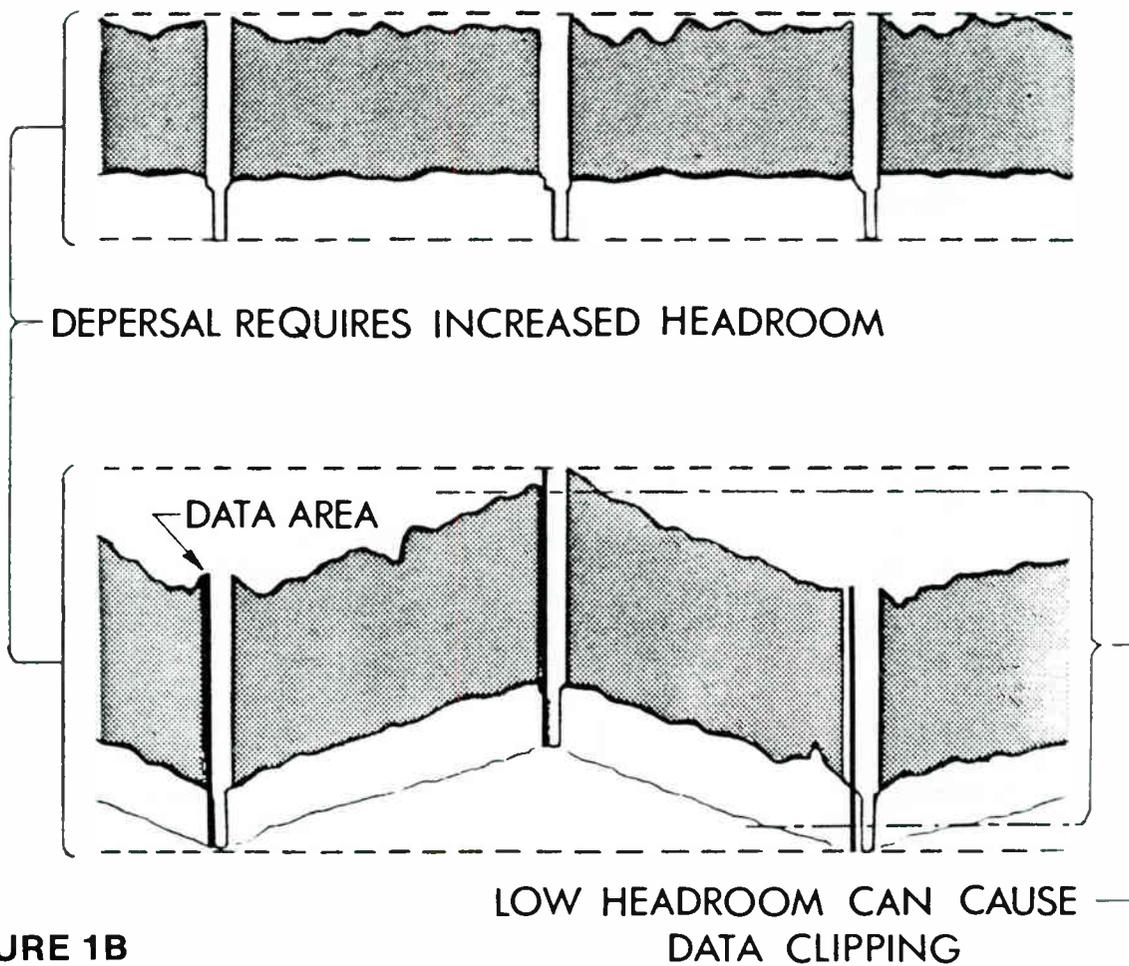
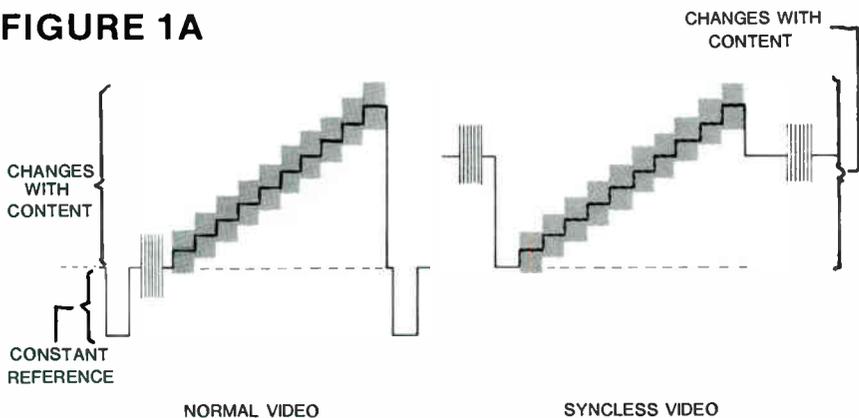


FIGURE 1B

quencies such as sub low, or inverted aural/visual frequencies

- \* polarity inversion of the video information on a continuous or alternating sequence
- \* suppression or removal of synchronization information
- \* addition of an interfering signal such as an RF carrier or baseband tone
- \* reorganization of the time sequence of the information

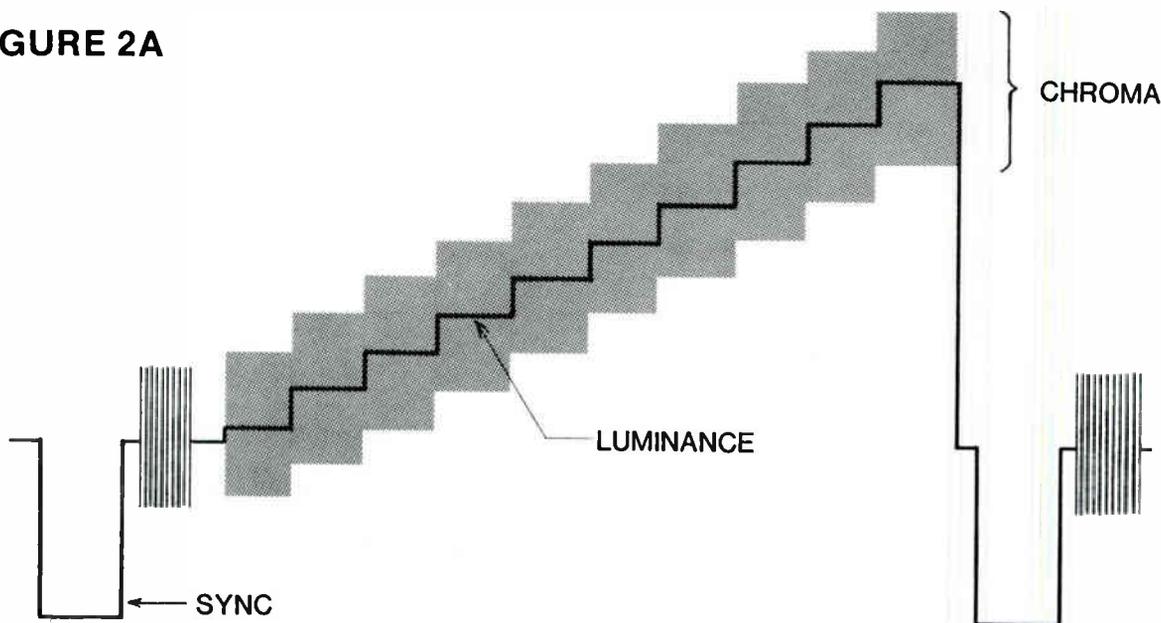
### Hybrid

Most products being developed for satellite security are actually hybrid scramble/encryption systems. These usually combine a scrambling security mode, with an encrypted control system. The reason for this is that the digitization of video requires very wide transmission bandwidth, and would be very spectrum inefficient for satellite or cable television systems. Thus, to date, no

requires a single decoder per channel for an entire CATV system. In this type of operation, the security can be as complex as required as the entire system must support only one decoder per channel.

The DBS market is quite different, with the allowable cost being in the \$300.00 area per decoder. Obviously some security trade must be accepted in order to make DBS viable, however,

FIGURE 2A



via repetitive or identifiable routine

### Encryption

Encryption can be defined as breaking information into pieces, and reassembling the pieces in an apparently incoherent fashion. Encryption in its true sense can be applied only to a digital or numbered sequence information mode.

An encrypted video system would be characterized by two primary factors:

- a) The transmitted signal information is *meaningless* in spite of the removal, rearrangement, or addition of any components, and
- b) The descrambler must be told *how* to decode the signal as opposed to just when to decode.

fully digital video encryption has been employed, with the exception of some slow scan or still frame transmission for teleconference security.

### EXISTING AND PROPOSED SATELLITE SECURITY SYSTEMS

Security systems for present and near future operations tend to fall into two categories. The first is the heavy security for network or pay television, while the second somewhat lighter security is proposed for DBS. The primary difference lies in the allowable cost for the end use decoder.

The security systems employed for pay or network application are designed to interface with CATV system head ends. This

this trade also makes DBS vulnerable to pirate activities.

The heavy security market is presently being addressed by three major contenders.

### Oak Orion

Oak Orion was the first system to be commercially employed in full time satellite transmission. The system is based on scrambled video with digitalized audio and computer control of decoder functions. The primary security consists of sync removal plus video polarity inversion. Security is hardest in the digitized audio, which is essentially unrecoverable to the backyard decode artist. Requirement to receive equipment include the exclusion of hard clamp circuits and clear data headroom.

**Ma/Com Linkabit Videocipher**

This system was selected by HBO but has yet to be made operational. The primary security involves time shuffling of the video information keyed to the DES algorithm. (Data encryption standard: National Bureau of Standards). The system includes two (2) channels of digitized audio, and encrypted decoder address and control. Requirements to receive equipment include the exclusion of hard clamp circuits and transparency to 2 MBS DATA. Two video outputs to the decoder are required.

**Digital Video MAC (S.A.)**

The MAC or multiplexed analogue component system operates with a quite different concept from most other scramble systems. In the MAC, the luminance and chrominance components are separated, reorganized, and reassembled into a new baseband which is quite unlike NTSC video. The system includes DES algorithm encryption and up to four (4) digitized audio channels. Receiver requirements are quite intensive, and require that the clamping, filtering, and emphasis filtering be by passed. In clear mode, a normal video output to the decoder must also be provided.

In the DBS security, the prime contenders are:

- \* TELEASE MAAST
- \* OAK PD (PERSONAL DECODER)
- \* CIPHER VIDEO II (MA/COM LINKABIT)
- \* GENERAL INSTRUMENT (SSD)

A brief description of each system follows.

**MAAST:** Sync removal with encrypted recovery data and encrypted audio

**OAK PERSONAL:** Compatible with Orion transmission

**VIDEO CIPHER II:** as yet undisclosed  
**G.I. SSD:** as yet undisclosed

**TRANSMISSION REQUIREMENTS**

The transmission of scrambled or encrypted video presents some new challenges to both the uplink and downlink portion of the satellite system. In particular, the satellite video link operates

to some parameters which are specifically designed for NTSC video. The encrypted or scrambled video often alters these basic parameters, and requires that the link operating mode be changed from a normal video transmission mode.

The parameters which can effect the link operation (both receiver and uplink) can be examined individually, although a given system will often involve changes to several of these items.

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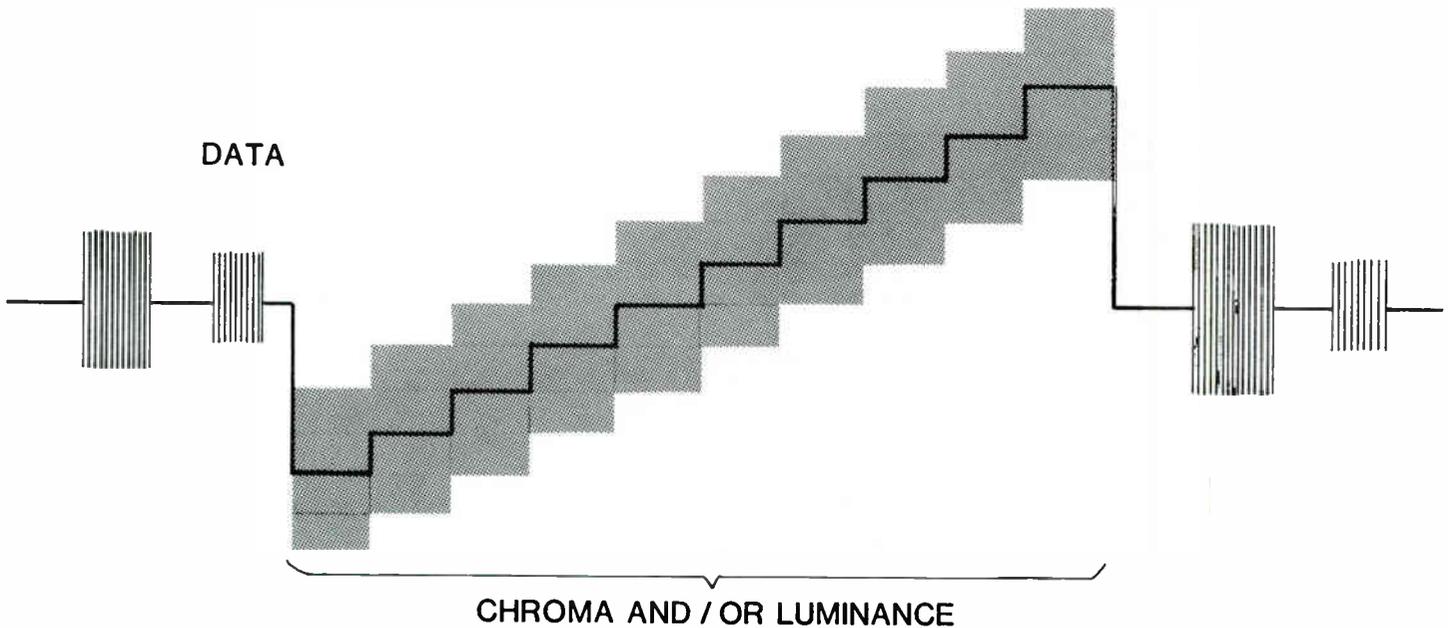
**Sync (or lack of)**

Transmission of video less sync is the most common difference

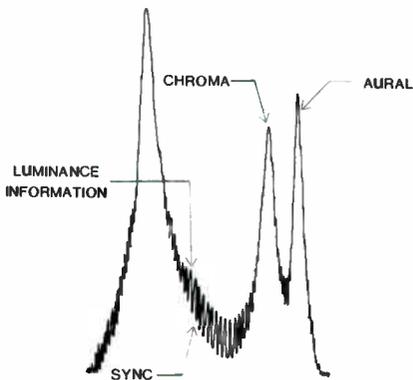
In the link transmission of video, the downlink transponder amplifiers are carefully control-

signal is, in fact, very forgiving, and operates satisfactorily in the presence of group delay and

**FIGURE 3A**



between secure and clear video. In a normal video waveform (baseband), the sync portion contains the *only* absolute level calibration point of the signal, as



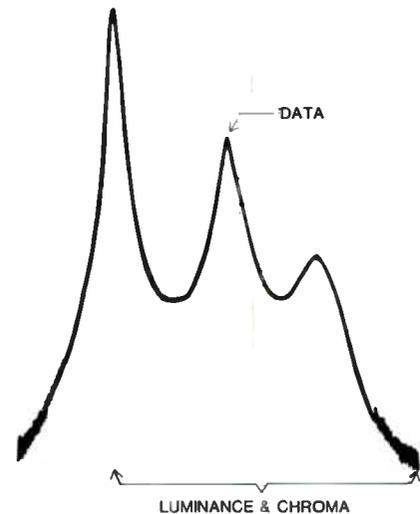
**FIGURE 2B**

the luminance portion changes constantly with content (Figure 1A). The lack of sync does pose some difficulties for some satellite uplink exciters, and, in fact, Video Cipher provides a short duration artificial sync pulse to avoid these difficulties.

led with regards peak carrier power. In order to reduce power under low modulation conditions, a dispersal signal is applied to the uplink video. The lack of sync can aggravate this problem, requiring that even greater dispersal levels be employed. This requirement can adversely affect the deviation/bandwidth relationship of the information portion of the signal; in particular, clipping of high level data is the most likely effect of increased dispersal levels (Figure 1B).

**Addition of Data Components**

Most satellite links and receiver systems were not designed with high rate data streams in mind. In a video link, only the lower frequency components are required to retain edge timing capabilities. The timing of television receivers is dependent on the square shape of the sync pulses; all other information relies on frequency or phase information. The NTSC television

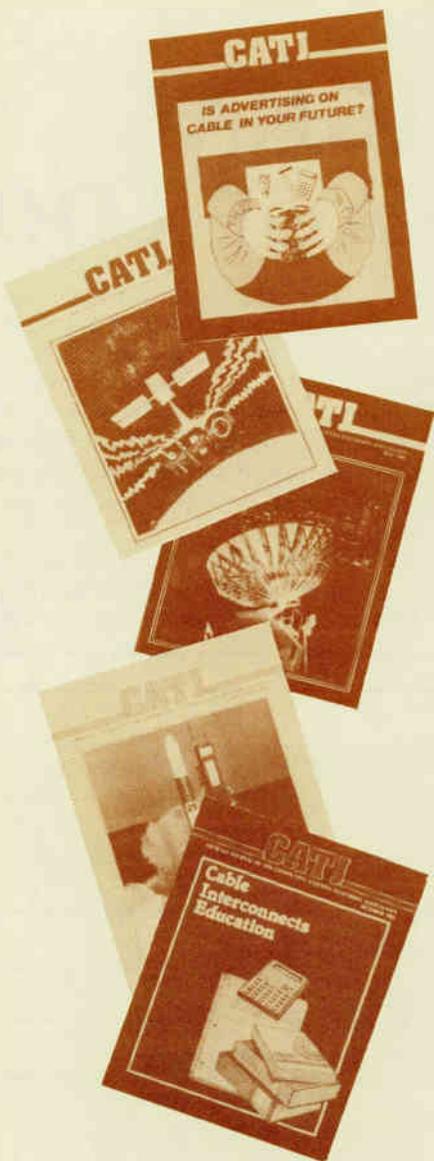


**FIGURE 3B**

linearity problems. This is not the case with high speed data. The inclusion, in most security systems, or very high speed (2-5 MBPS) data streams can be adversely affected by such things as emphasis curves, roofing filters, and amplifier headroom.

Perhaps an examination of normal video link and its NTSC video related parameters as compared to a theoretical secure video transmission may illustrate the

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

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

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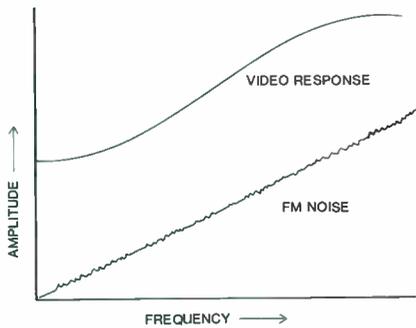
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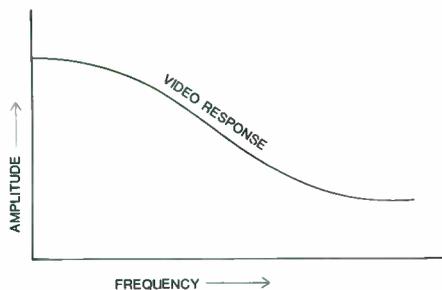
problems which could be encountered. In Figure 2A, a normal video baseband wave form is shown, and in Figure 2B, the resultant spectral equivalent is shown.

Figure 3A and 3B show the same signal with a theoretical security system involving sync removal, relocation of various frequency components, and additional data components. The headroom problem can be alleviated by employing a predetermined rolloff in the data pulse shape, (i.e. raised cosine) however, this is sometimes overlooked.



TRANSMITTER VIDEO RESPONSE

FIGURE 4A



RECEIVER VIDEO RESPONSE

FIGURE 4B

### Link Response Shaping

A normal NTSC FM link has been optimized for television performance in several significant areas. Due to the triangular noise characteristic of FM transmission (Figure 4A) the video signal is shaped (pre-emphasized) to maintain overall noise performance over various frequencies. The TVRO receiver frequency response has been similarly (al-

though inversely) shaped so as to maintain the required flat response (Figure 4B). The response curves of the pre-emphasis and de-emphasis filters bear a specific relationship to the type of signal being carried. Several security systems alter the frequency components/function relationship of the signal, and can require that major modification to the system response be undertaken. This can result in major alterations be performed to both the uplink and the receiver, and can also render the link incapable of operating in a standby normal NTSC video mode. This can require, as in at least one system,

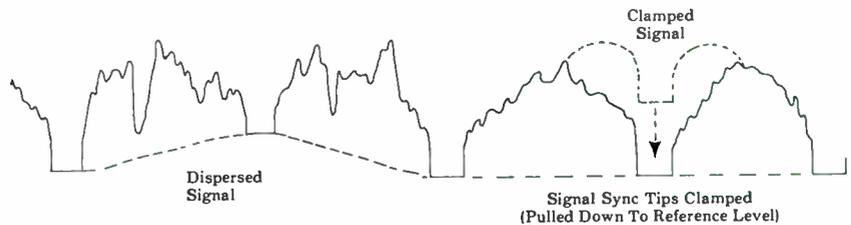


FIGURE 5A

the capability of the link to switch in, or bypass, several receiver/transmitter functions when a clear to secure transfer is performed.

### Clamping

The method by which the dispersed signal is removed at the satellite receiver can cause severe problems. The most common clamping circuits are classed as hard clamps. These circuits locate the sync pulses and force them to a constant DC level (Figure 5A). During absence of sync, these circuits will normally locate and act on *some similar component* such as data, with devastating effects (Figure 5B). Nearly all security systems specify that all clamping circuits be disabled. Only active clamp circuits, such as energy dispersal waveform feedback, can handle both normal video and secure video without damage.

## TESTING AND OPERATING

To a link user, such as a TVRO maintenance engineer, the testing and monitoring of a secure system presents several distinct problems. In the worst case, measurements may have to be limited to the decoder output. This results in serious confusion over whether a fault lies in the receiver, uplink, or decoder equipment. In most cases, the actual secure video is almost unrecognizable to the unexperienced engineer. The testing difficulties fall into three primary areas:

1. Test Equipment
2. Fault Recognition
3. Unfamiliar Technology

1. Most video/audio baseband test equipment relies on the presence of sync (or colour) information in order to operate properly. In many cases, waveform monitors, test demodulators etc., will not operate on secure video. Even if the equipment is able to recognize and display the signal, the presence of high frequency added components can make proper examination impossible.

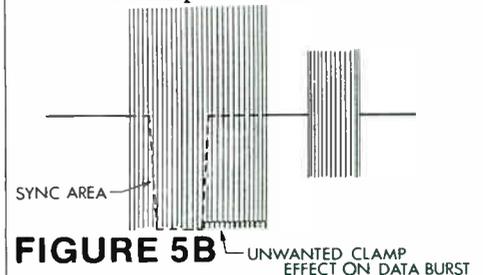


FIGURE 5B

2. Should the signal be accessed and displayed, the second problem becomes "what to look for". With normal NTSC, the

measurement of level, for example, becomes fairly simple. The measurement of level in the absence of sync or white reference can be extremely difficult. The accepted method, of measuring in non-secure mode, may be in error if the transition to secure involves bypass or addition of various sub-systems.

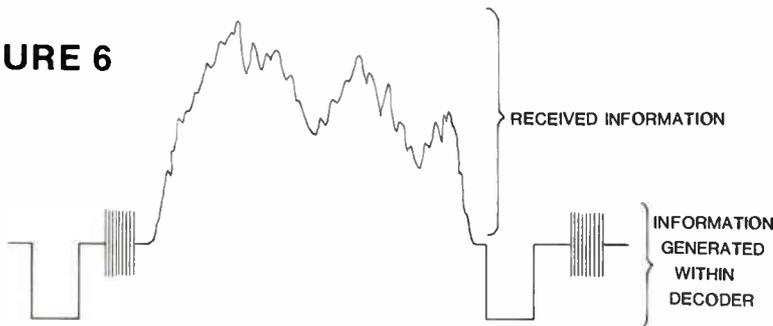
In the measurement of the signals after decoding, one

hardware manufacturer, and they may not be available for assistance.

In fact, there are only two test methods open to most CATV operators who must troubleshoot security systems. These are:

- a) *Test the receiver equipment on a non-secure channel (and hope that most transmission parameters on the secured channels are similar).*

**FIGURE 6**



other problem can arise. Very often the decoded video signal will consist of received components, and components generated by the decoder (i.e. reconstructed sync, colour burst etc. (Figure 6)). Unless the operator is familiar with the operating details of the system, serious confusion can occur.

- 3. Several components of the secure signal, such as data and reconfigured frequency contents may be totally beyond the scope of available equipment or skill to test and troubleshoot. These items may only be within the capability of a few experts from the security

- b) *Test decode equipment by substitution, if no success can be achieved from the normal available test information.*

Certainly the interaction between the RF and digital portion of the system will be the cause of many a headache to system engineering staff in the future.

### OBSERVATIONS

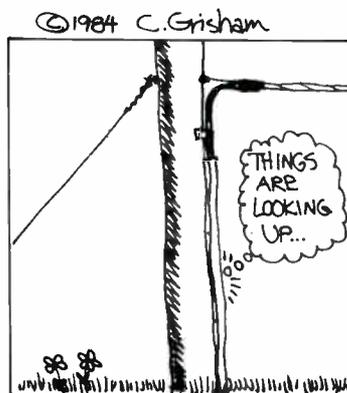
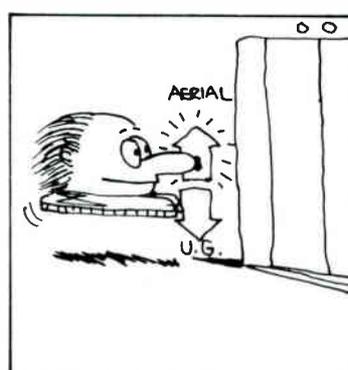
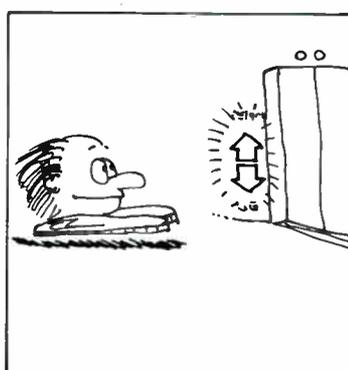
While at first glance, we may see only the negative side of secure transmission, it is important to remember that in the near future, all valuable communication will probably be secured. The modern age of advancing electronics allows the

average person tremendous (often unauthorized) access to communication.

Most of the problems associated with the first satellite scrambling endeavors have been solved, and the lessons hopefully learned. There will, however, be interface problems with new systems, and they must be met and overcome. We have, however, some advance experience which will prove invaluable. The manufacturers of security systems, historically experts in data transmission, are beginning to become aware of the real world of noise, intermod, hum and distortions that exist outside the lab. These factors are now being taken into consideration in new designs for security systems. The cable operator, who sometimes has been guilty of overlooking performances will be required to handle secure video. There is however, a great deal to learn about the potential interface problem. This is obvious to those operators who have already installed a terrestrial system. This, coupled with the satellite link which is, in itself, a relatively unknown quantity to the average CATV technical staff, presents great potential for misunderstanding and confusion.

The key, as proven with Cancom, will be active co-operation between the security and the transmission equipment suppliers. This will make, or break, the successful operation of the system. □

**LIB** NO. 12





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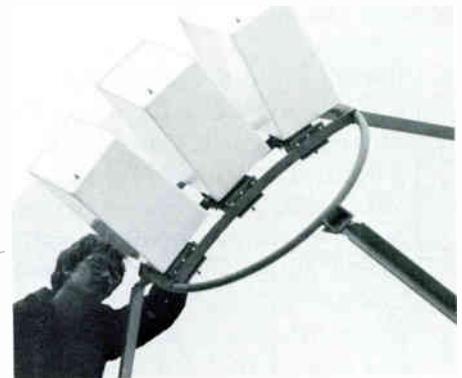
Existing Microdyne antennas can be easily retrofitted to accommodate this new system. Only the struts and brackets of the feed support hardware

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## Appropriateness

The question of when to use the telemarketing is one that is continually being asked. The problem is that different people will give you different answers to that question. Some of those who swear by its unfailing effectiveness are allowing their proprietary interest to fog up the objective windows of their mind. What we will attempt here, as a company which includes telemarketing as one of many tools, is not to offer a hard answer to the question. Rather, we will try to point out some of the common considerations one must look at in order to arrive at the decision. Some of these considerations are:

1. For an in-house operation, do you have adequate physical facilities and telephone lines to accommodate such an undertaking?
2. Are you prepared to provide supervision during prime telemarketing time, which is about 5:30 - 9:00 weekdays and 9:00 - 12:00 Saturday morning? While there can be limited success at other

*confusion and campaign failure. If you are using a telephone campaign to soften the market, that is one thing. However, if you plan to attempt a sale of a complex array of new services and pricing, the campaign may collapse before you are withing shouting distance of desired penetration levels. In the former, you are "introducing" consumers to the new products and indicating that they should look in their mail box, read the newspaper or listen for a knock at the door to obtain further information on which to base a buying decision. In the latter situation, you are asking them to make a buying decision based on a bewildering volume of information without graphic illustration and only limited opportunity for questions. The most successful telemarketing sales campaign in which we have participated have been those involving only minor changes at basic and only one or two new premiums. This type of message can be succinct, clear-cut and brief,*

*efficient approach to executing a marketing campaign. You can canvas literally thousands of homes in a relatively short period of time. However, this can create other problems, and speed should only be important if other considerations are met.*

5. What is your budget? *Telemarketing is generally going to be less expensive than a direct sales campaign. Thus, you may be faced with a situation where you would not normally use telemarketing but may be forced because of budget constraints. We should say, however, that we cringe a little on this one, because it is our position that a marketing decision must be evaluated not only on the cost side but on the revenue side as well. Too often, we accept considerably less sales and revenue than could have been accomplished with only marginally more expenditure.*

## Sales/Retention/Scripts

We have already discussed some of the considerations you might have in determining the appropriate use of telemarketing in a sales campaign. While sales represents a major area of interest for telemarketing, operators should look at the possibilities in the areas of consumer reinforcement, community surveys and reselling of disconnects or those threatening to disconnect. We have instituted effective programs in all areas, and programs are available which will provide a virtual step-by-step approach to each of these activities.

---

***"...we cringe a little . . . because it is our position that a marketing decision must be evaluated not only on the cost side but on the revenue side as well."***

---

- times, these represent the best access to consumers.*
3. Is the message you need to deliver relatively complex or relatively simple? Our experience indicates that a complex message is more difficult to convey on the telephone and can lead to

- allowing the consumer to make a buying decision comfortably.*
4. What are your time parameters for execution of the sales, retention or other marketing programs? *Telemarketing probably represents the most time-*

One of the critical components in any program is the script, whether it is an entire word-for-word sales pitch or a flexible, interactive guide for handling threatened disconnects. We will attempt

with the customer to assure that the sale is supported.

Another case was in the non-sale community survey area. In this particular case, the survey was aimed at uncovering customer problems, and

### Turf Management/Tracking

In an earlier section we talked about the time efficiency of telemarketing programs. This has its benefits, but can also have its drawbacks. The primary problem that it creates, in our view, is that it moves so quickly that you can "burn" half your system before you know it. If you are not on target it may be too late to take corrective action. The "speed freaks" among you are not going to like what we recommend, because it basically involves a slow-down tactic in the early going.

Before you make the first telephone call, you should spend the time necessary to develop forms and reports which will tell you exactly where you are on a daily basis

---

*"...ask 'How's it going?' and the answer is almost always 'Fine!' "*

---

here to provide some general approaches and considerations which should be helpful.

We almost hate to say this, but the first step of the process is to determine exactly what you are attempting to accomplish from the telephone call. Let us say (over the boos and hisses) that we have seen many scripts which were well-organized and eloquently phrased, but which failed miserably to accomplish desired results. A particular case involved a cable product script which went to great lengths to describe the products, expand on all of its subtleties and then kind of dropped off the page without really asking for the order. This was further compounded by the fact that the product was well-known and needed little explanation. Our approach was to use a brief description of the product, give a quick look at the promotional deal (free install or whatever), and ask for the order. If the customer balked, we would then enter a kind of second stage of reinforcement and explanation, followed by another close attempt, and so on. The point is that we were there to sell - and the only way to sell is to ask for the order and ask for it frequently. Once the sale is made we can follow up with specific reinforcing materials and communication

complaints, while also accumulating useful marketing information. When we meet someone in the shopping mall and ask "How's it going?", the answer is almost always "Fine!". Now, if we had asked about their toes, kneecaps, head, or specific members of the family we might have

---

*"...we have seen many scripts... well-organized and eloquently-phrased, but which failed miserably to accomplish desired results."*

---

uncovered the real truth. Frankly, without the real truth, the survey would have been of little value. Yet, there it was, a document full of "How's it going?" questions awaiting all those "Fine!" responses. After considerable rework, we finally built a meaningful document which accomplished its purpose.

We say all this simply to say that you need to zero in on the specific purpose of the script - the end result at which you are aiming. Then, almost word-by-word and sentence-by-sentence measure the entire content against its direct correlation with the objective. If there is none, get rid of it...and, for Pete's sake, ask for the order.

in terms of homes passed, contacts, sales etc. Then, we feel it is in your best interest to conduct a preliminary trial run with a small portion of the universe, not only measuring results but identifying weaknesses in the script or tracking systems. You can also get some ideas about how quickly the campaign may develop and will know the frequency with which you must dip into the process to assure adequate time for reinforcement and corrective action. It is not an infrequent occurrence to find operators who were shocked to find their telemarketing canvas was over and they were nowhere near their targets. Some of this could

be due to the fact that they were using the wrong tool, but it was often a function of not really understanding where they were on the path to completion.

### Compensation/Motivation

We can't really talk about telemarketing or telemarketers without some discussion of compensation and motivation. We participated in a study conducted by an international consulting firm which gave us insight into the telemarketing personality. While we can't provide all the specifics of their findings it is not necessarily a stereotypical sales-type. In fact, we have found some of the most successful telemarketers to be those with no sales experience and no real interest in sales. It was rather through their attitude toward the work place, a sense of team, and strong work habits that they achieved their success. In some measure, they are motivated by the opportunity for earnings, but recognition by peers and superiors and frequent acknowledgement of work quality seemed to be more important.

The different approaches to compensation range from a commission-only approach, to an hourly plus commission or bonus, to a straight hourly. In this regard, we find ourselves somewhere in the middle for a variety of reason. First, a totally commission-driven system can sometimes result in marginal sales. The telemarketer is faced with an all-or-nothing situation and will either push for something or retire from telemarketing very quickly. Secondly, a plan with only hourly wages does nothing to provide incentives for performance beyond expectation. Thus, an hourly

component will help to pay for their time on a bad night, but should not represent the total income opportunity. Providing either a commission or bonus award program should result in the proper mix for a successful program.

### Recruitment

We are only going to address the recruitment issue briefly, and only to say that you may not want to look in the same old places for telemarketing help. They can be found in homes, schools and other places, but probably not looking in the sales section of the classified section. In fact, they are more likely to respond to advertising in the general "help wanted" section.

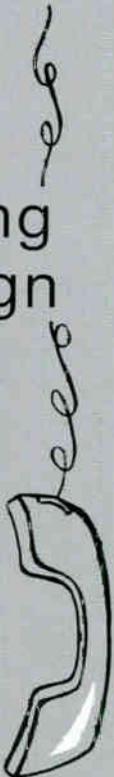
It is important to have them call in first and preferably to the person who will make the selection. After all, remember it is that "voice" you want — one that can move consumers to action even at arms length. Also, be certain they understand working hours and compensation, since many will have other obligations during this period. Finally, plan to recruit regularly, as there will be sufficient opportunity to infuse new people as time goes on.

### Summary

There are many ways to approach a telemarketing program. You can handle it alone, bring in an outside firm for startup, or leave it to an outside firm altogether. Too, it can be done on your premises, or in a location which may not even be in the same state. Regardless of your choice, telemarketing can prove to be a valuable part of your overall marketing effort, but should be approached with the caution and care we have suggested. □

# HELLO! HELLO!

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# The Effects of Customer Telephone Handling on Field Service

by Robert J. Dattner, Fairfax, Virginia

**W**ith the growing awareness in the cable industry of the importance of customer service comes an understanding of the effects proper subscriber handling on the telephone has on the installation and service technician group in the field.

Field calls are expensive. They are affected by travel time and the length of time spent with the subscriber. It is as important to correct the subscriber's problem psychologically, as it is to repair the cable system. We talk about "fixing the subscriber" before we "fix the system". A subscriber who is not emotionally satisfied will magnify every imperfection, regardless of the quality of the repair work.

It is equally important to reduce the number of field calls and properly route them. We have found that a good 30% of the incoming calls, with a service related problem, can be handled on the telephone. This number is conservative in a newly cabled area where many of the calls are educational in nature. Subscribers often "test" the cable company to find out: if calls are really free; if the pictures are as good as they can be; and to see how long it takes for service. Handling a subscriber "on the phone" should be recorded in the subscriber's service file and given just as much credit as a field call. These calls save the cable company money!

See diagrams on Page 34 and 35.

## The Subscriber

Callers with problems are pitchers needing to be emptied. They may feel victimized, down on the cable service or its people. They may feel, "here we go again" one person against the big impersonal corporation". The customer service representation must dispell that immediatedly. (This section is loosely based on Paul Rega's Persuasive Communications Courses, Chicago, Ill.; 1981)

We use a 7 step approach:

1. Listen, listen, listen!
2. Isolate to today's problems.
3. Discuss how to fix today's problem
4. Try to handle the problem on the phone.
5. Record the information.
6. Dispatch the call.
7. Follow up.

The listening part is usually the hardest. The customer service representative must allow the pitcher to be emptied. Otherwise, the telephone call and the field trip will be lengthened. The caller may have a long list of problems. He/she may produce a history of cable that predates the franchise, but the caller must be allowed to "let it all out". A few deep breaths, (with the phone covered), are a good way to handle stress.

Once this is done, any anger and resentment should be exhausted. The customer service representative must be responsive and empathetic without accepting blame or promising miracle cures. "Perfection" is only possible in the next life. Cable is a people business, not a technology, and the representative must convey this to the caller.

The customer service person



*Open Customer Service area*

*Telephone answering*

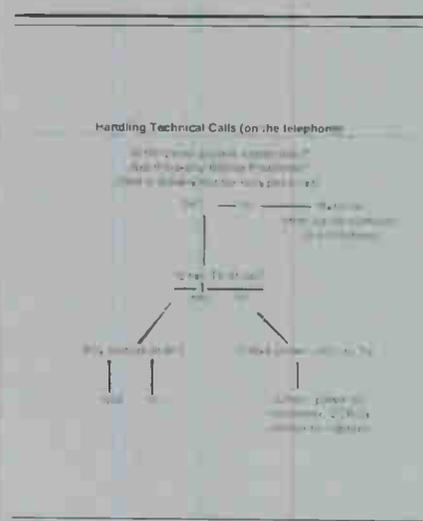
wait around all day for a call. This is a dilemma which must be carefully handled. Obviously, the telephone companies and appliance repair companies have the same problems, but cable's problems are not always readily accepted.

Here the Customer Service group can really earn their pay. Subscribers must be sympathetically handled, but timed calls can mean field inefficiencies that result in lower overall service. We say we will "try" to get a technician out in the AM. (8AM TO 1PM), PM, (Noon-6PM), or evening, (5PM to 10PM). But we cannot guarantee the appointments. This must be explained carefully to the subscriber or the technician will spend most of his time "fixing" the subscribers. We overlap the times to give the technicians more leeway. The problems of running technicians back and forth across town to meet appointments remain how-

ever. Communication with the subscriber is the key. The inside group must be properly staffed to support the field staff: calling subscribers before traveling to a call, notifying subscribers when an installer or technician is running late. These are the keys to keeping a communication company communicating.

**Hiring and Training, (and Moral Support)**

Training should involve classroom theory on the technology, programming, paperwork systems, and telephone techniques. Riding with the service and installation group for a couple of days will add "real world" to this theory. It will also expose the outside staff to the new inside people. This training should be repeated 3 to 6 months after a new employee comes on board. On the first trip, new hires may not yet know what questions to ask.



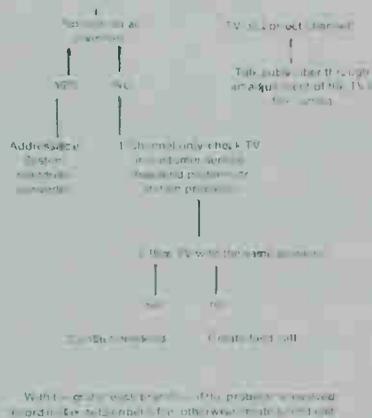
**Physical Facilities**

A real moral problem can develop in Customer Service since the preponderance of telephone calls are rarely complementary. The design of the physical atmosphere in which the employees work can adversely effect their performance. The noise of a ringing telephone is effective in get-

ting someone to answer it, but does little for hassled nerves. Greenery. (ie. plants), and an open airy office are in vogue and seem to do much toward a more relaxing atmosphere. The ability to walk around, look out windows, and interact with the other representatives are also vital to

mutual support. Informal communication between employees and departments is what makes the formal paperwork system work. It should not be discouraged.

The key to good service is hiring good people, training them, and keeping them satisfied. It is important to take full advantage of the desire of most employees to deliver quality service. It doesn't pay to enhance short term profits by sacrificing the long term profits good service will deliver. Many dollars can be saved in recruiting and retraining expenses due to turnover with a good training program which appeals to and retains quality employees.



### Management Aides

Management is organizing, motivating (training), and control. In the control area, numerous telephone and service call statistics are vital to the allocation of scarce human resources. The number of calls per hour over a seven day period and over the billing cycle is an accurate way to determine the number of

### Employee Motivation

MBA programs spend alot of time oversimplifying what makes people work. Without claiming to have discovered any great solutions, consider the following ideas:

*The "pure" engineer:* Quality is the driving factor. The perfect machine, the solution to a complex technical problem, are their own rewards.

*The "pure" manager:* A "win" is the driving factor. Set up a game plan, (the budget), and keep score. Meeting the numbers is the reward.

*The "pure" service oriented person:* A "smile" from a subscriber, (customer), is the proper result from long hard work. A thank you is more important than meeting the numbers or fixing the machine.

A successful cable television business will meld all three personalities to create a team which equates "quality" with a "smile" and within a winning budget.

**L-1 CABLE LINE LAYER**

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## Important Telephone Statistics

(plotted by the hour each day)

- Calls per hour.
- Lost calls per hour.
- All trunks busy.
- Calls answered within 3 seconds.
- Calls put on hold.
- Average holding period.
- Maximum holding period.
- Average length of time with representative.
- Maximum time with representative.
- Telephone Representatives per trunk.

incoming telephone lines and the ratio of customer service representatives per telephone trunk. Measures of holding time, lost calls, (when a subscriber hangs up before being answered), and busy signals to incoming subscribers are important figures of merit.

The service call controls are equally useful but not as easily mechanized. The breakdown of calls handled in the field versus on the telephone; the scheduling of all day calls versus timed appointments; the service level required on non-peak hours, holidays and weekends is vital to the "service" cable television delivers.

Some on-line billing and custo-



Phone answering location

mer information systems have been expanded to produce this kind of data. More needs to be done in this area. The methods we use to measure picture quality are extensive and well understood. The methods for measuring human productivity are not as clearly defined, but no less important in a service industry.

### Conclusion

Cable Television's major product is service delivered by people for their neighbors. When we treat the business as regulatory or technology driven, it is easy to

lose sight of what we really have to sell. Better techniques for delivering the service begin with the Customer Service telephones and sometimes are completed in the field.

The quality of our service and the cost of providing it depends on the coordination between the inside and outside service groups. Service oriented employees are usually not difficult to find, but it is the challenge of management in the cable industry to take advantage of their talents and nurture them within the objectives of the organization. □

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November 1-4, 1984, Kunst & Kongresshaus, Lucerne/Switzerland

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give lectures on the technical, media-political, legal and economic fields. The CATCOM exhibition informs about the latest technical developments, such as fibre optic cables,

satellite TV, Pay TV, etc.

Organisers:

VSK, Union of Swiss Cable Television Services

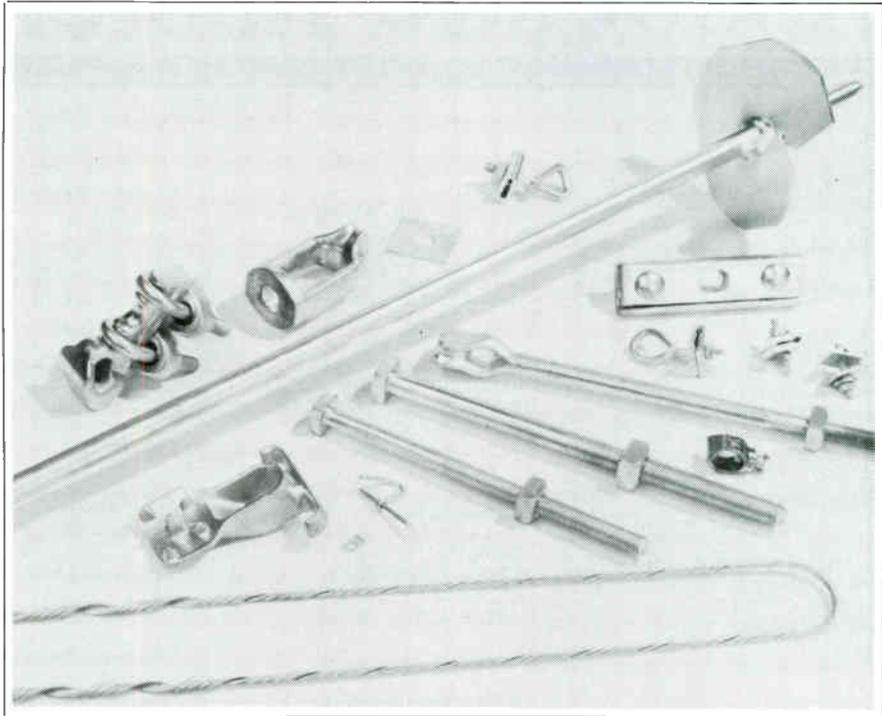
Inquiries and documentation through: Sekretariat CATCOM 84, Oberdattenberg 1, CH-6005 Lucerne, Telephone 041 - 41 85 33 + 35

# Showcase

## POLELINE'S PRESTIGE SERIES

**Poleline Corporation**, a wholly-owned subsidiary of RMS Electronics, Inc. proudly announces a new superior hardware line... the **PRESTIGE™ SERIES**. The Prestige™ Series is manufactured to meet or exceed ASTM Specifications. Although it is a comprehensive and complete line as it stands, this line of products is continuously growing, and our catalogs will be updated with new products from time to time.

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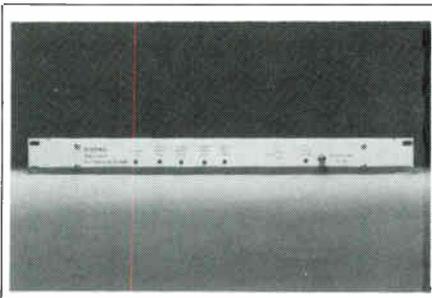
erence listing other manufacturers' part numbers. Qualified Industry personnel may obtain a free copy

of this catalog by writing to: **POLELINE CORPORATION**, 20 Antin Place, Bronx, NY 10462 •

## CATEL OFFERS NEW MODULATOR FOR SMAT, MATV AND CCTV

**CATEL Telecommunications** has met the need for a TV Modulator which can meet the needs of the market by introducing their **TM-1400**. A low user price has been achieved without a compromise in quality or performance through innovative engineering and manufacturing. The **TM-1400** will help satisfy the requirements for **SMATV**, **MATV**, and **CCTV** applications.

The **TM-1400** TV Modulator offers **MATV**, **SMATV**, and **DBS** operators the advantage of heterodyne modulators at a price consistent with their economic objectives. Application includes **TVRO**, **Camera**, **VTR** modulator or any



use where baseband video and audio is to be converted to standard or special TV channels.

The single rack mounting frame (1 $\frac{3}{4}$ "") of the **TM-1400** includes video and audio input circuitry.

CATEL has been supplying television modulators for over 15 years, and that experience has been utilized in providing a product that is of the highest value consistent with that offered by CATEL's **TM-2400**, (RCA) **CTM11**, and **CTM20** Modulators offered at

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CATEL Telecommunications is a Division of United Scientific Corporation — a Subsidiary of Data Design Laboratories, Cucamonga, California. CATEL manufactures a broad line of video, audio, data transmission, and multi-plexing equipment for coaxial cable and fiber optics systems. CATEL recently acquired a complete line of headend products from RCA.

For more information contact: Elizabeth D. Holthofer, Marketing Services Manager, CATEL Telecommunications, 4800 Patrick Henry Drive, Santa Clara, CA 95054, (408) 988-7722, Ext. 213 •

# Associate Roster

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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D7—CATV connectors	M7—CATV connectors	S7—CATV drop installation
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D9—Other	M9—Other	S9—Other

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**RMS Electronics**  
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1-800—223-8312  
1-800—221-8857 (Poteline)  
(M4, 5, 6, 7, 9)

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

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

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

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

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

\* **Texscan Corp.,**  
3102 N. 29th Ave.,  
Phoenix, AZ 85017  
602—252-5021  
(M9 Bandpass Filters)

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

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

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

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

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

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

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

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

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

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

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

**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 Towers**  
Box 347  
San Angelo, TX 76901  
915—655-6262/653-3363  
(M2, 9 Towers)

**Zenith Radio Corp.,**  
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