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OFFICIAL JOURNAL OF THE COMMUNITY ANTENNA TELEVISION ASSOCIATION
JULY 1982

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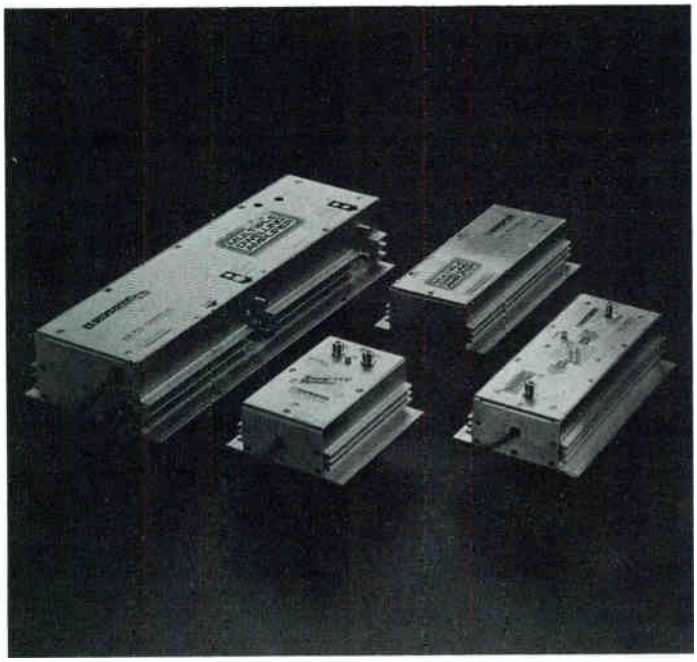

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Model	Gain	Bandwidth	Output Capability*
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SMDA-300	20 to 40 dB	50-300 MHz	+49/44 dBmV
SMDA-440	20 to 40 dB	50-440 MHz	+47/42 dBmV
Reverse Amplifier	10 to 30 dB	5-32 MHz	+50 dBmV
Multiple Dwelling Amplifier			
MDA-300-30-T	30 dB	50-300 MHz	+49/44 dBmV
MDA-440-30-T	30 dB	50-440 MHz	+47/42 dBmV
Signal Stretcher™ - Two-Way			
SS-300-15-T-2W	15 dB (flat)	50-300 MHz	+45/40 dBmV
SS-440-14-T-2W	14 dB (sloped)	50-440 MHz	+41/36 dBmV
Reverse Amplifier	0 dB	5-32 MHz	N/A
Signal Stretcher™ - One-Way			
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SS-440-14-T	14 dB (sloped)	50-440 MHz	+41/36 dBmV

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CATJ SALUTES CCOS '82 AT NASHVILLE
JULY 3 - 6, 1982

WHERE CATA STANDS ON ALL THE MOST RECENT ATTEMPTS TO LEGISLATE CABLE TELEVISION

This has been the year for cable legislation. Not that any of it has passed, or has much of a chance for passage, at least in this session of Congress. But it is significant to note that the activity generated in Washington over cable legislation is certainly an indicator of things to come. Cable is growing. We are finally being recognized as a medium in our own right. The latest survey results indicate that cable is now in one-third of all television homes — some 28 million of them. With that type of clout there is no wonder that we have finally attracted attention.

The attention has come in the form of various proposed pieces of legislation in the Nation's Capitol. Some of them have been generated by the cable television industry itself, others from our competitors. In all cases the issues are complicated and the stakes are high, so Congress is going slow, as we believe they should.

Because of all this activity it seems like everyone is confused as to where the major actors in the ongoing drama stand. To be sure the positions of the various groups on the Copyright issue have shifted around so drastically that anyone not following closely would be in total shock to see what the advocates are saying today. I thought it was about time to clarify what the position of the Community Antenna Television Association is on the pieces of legislation now before Congress.

It should come as no surprise to anyone that the bottom line position of CATA is that in most instances the government should stay out of the business of telling us what to do or how to do it. There is overwhelming evidence that government interference with business and commerce is one of the biggest problems we face. It is certainly not safe to assume that the government knows how to do it "better" than private enterprise. That is our position in almost all cases where legislation or regulation is proposed for the cable television industry.

There are, of course, exceptions. Those exceptions primarily relate to situations where the government has already done something, generally to, or for, another industry group and the result is that the open marketplace cannot work since there is already a bias injected into it. Examples would be the copyright situations, where the broadcasters can compete for programming with far more money because the government has given them their spectrum space for free while we have to pay for our delivery of programming to the home. Another example would be the funding, by the government, of telephone companies at low interest rates to go into the cable television business. The solution in both of these cases is either to equalize or eliminate the preference. Where there are no preferences to begin with, we prefer that the government stay out of our business. Unfortunately, that has not been the history of government in the past, and, given the spate of bills before Congress now, the future is likely to be littered with communications legislation that affects cable.

So where do we stand on the various bills? Let's take a look at them one by one:

HR 5949 — COPYRIGHT

CATA has made its position very clear in the copyright area. We have been editorializing on these pages over the past year very actively in support of the existing Copyright law and the fact that there is no need to alter that law at the present time. We maintain that position. HR 5949 (formerly HR3560) does not need to exist except for one provision, and that one provision is so important to us that it may outweigh our original position. As you all know, a Court in upstate New York has ruled that microwave and satellite common carriers ARE subject to copyright liability for carrying broadcast signals to cable systems. We do not for a minute believe that that decision will be sustained on appeal, but in the meantime it could cause havoc in the industry. HR 5949 corrects that problem. It also puts to rest the ongoing dispute over copyright at the expense of reinstituting syndicated exclusivity and the "must carry" rules. That is quite an expense to pay. CATA has told Congress that we support the COPYRIGHT provisions of HR 5949. We do not, and will never support the inclusion of the "must carry" rules in any legislation.

CATA was originally very strongly opposed to the so-called "Copyright Compromise". It was in part because of that vocal opposition that the compromise was altered (and we dubbed it "Son of Compromise"). As it finally came out, the compromise solved a lot of our first problems. We still do not like the reimposition of the syndicated exclusivity rules, however it may be a reasonable price to pay for solving the "EMI problem". Regardless of whether the bill passes or not, and there are growing prospects that it might, Congress is on

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Ben V. Willie,
President of CATA

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notice that CATA's membership at the very least, and we suspect the whole industry will continue the fight against mandatory carriage of broadcast signals as a violation of the First Amendment and an illegal and unwarranted preference for broadcasters over other programmers.

HR 5158 — AT&T LEGISLATION

This is a very complex piece of legislation with many facets. The one of most importance to us, of course, is that part deals with the ability of AT&T to get into our business. Here we have to look at the philosophical leanings we have away from any government interference in the marketplace against the fact that AT&T is such an overwhelming presence in that marketplace. HR 5158 balances those two considerations and comes to a reasonable conclusion which allows AT&T to compete in some markets and not in others. We support that solution and consequently we favor the passage of HR 5158.

S. 2172 and S. 2445 — The Cable Telecommunications Act

We are forced to combine our consideration of these two bills. While they are very different in content, their proposed goals are similar. Both bills try to deal with the sticky issue of the appropriate mix of government regulation (Federal, State and local) and free enterprise, recognizing that cable has grown up in a regulatory environment.

The first question is why should there by any bill? We believe some sort of legislation IS necessary in this case because regulation at the non-federal level has gotten out of control. That regulation must be checked, and the only way to do it is with a bill from Congress that calls a halt to the unreasonable demands now being made on the industry. Both S. 2445 and 2172 accomplish that result.

The bill, however, approach the problem from different directions. In S. 2172 Senator Goldwater has proposed to limit the powers of the city and state regulators by comprehensive federal preemption of cable regulation. In S. 2445 Senators Cannon and Hollings opt for the approach of specifically defining out of regulatory jurisdiction specific areas of cable activity while leaving other areas to the state and city regulators.

These are very complicated bills, and CATA will be providing details on both in an upcoming issue of the CATAcable. However it can be said now that in principal we support the concepts behind both bills. A great deal of work will have to be done, however, before either is ready for a vote. There is language in both bills that would not only be detrimental to the cable industry but would lead to ambiguities that would be litigated for years to come. We can well do without that! We are going through that experience with the Copyright Act right now.

Naturally politics play a part in any legislation and it should be obvious, since S. 2172 was introduced by the majority party in the Senate and S. 2445 was introduced by the minority party in the Senate that this set of bills is particularly vulnerable to political considerations. We would hope that everyone involved in the effort to get either bill adopted refrain from taking a strong "political" stand for or against provisions of either bill. There are things to recommend both of them. Ideally, in the end what emerges will be a combination of the best thoughts from all sides. We doubt that either bill, by itself, will be adopted without significant revisions. Hence we are hoping that Senators Goldwater, Cannon and Hollings, and all the other Senators who undoubtedly will become involved as these bill progress, work together to accomplish a result that they all seem to agree upon; the deregulation of the cable television industry. We, of course, agree with that proposition as well. Now it is time to jointly create the mechanism to see that that ideal becomes reality.

There is no question that there will be lots of fighting over these bills, probably over the next year or so. It is unlikely that any comprehensive bill can be expected out of this session of Congress — but next session poses a new opportunity. The structure of any cable legislation, we suspect, will be found in a combination of the two bills now on the table. It is for that reason that it is important for all of us to focus on them now.

CATA represents the thoughts, needs, and desires of many independent cable television operators throughout the country. Our position on any particular piece of legislation may or may not be similar to that of other industry trade groups. What it is, however, is consistent. We would prefer no legislation when that is possible. When it is not possible we will support that legislation that assures as little government interference as possible. CATA members believe not only in the free marketplace, but in our own ability to compete in it. Let's keep it that way.

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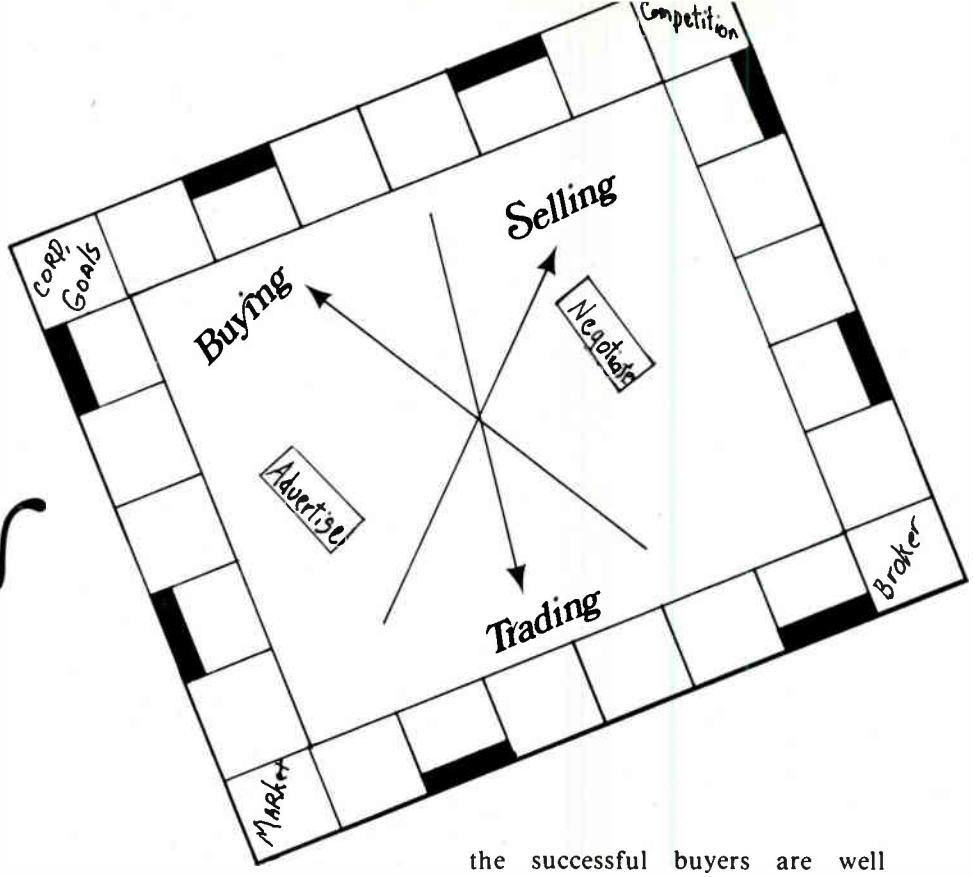
LEGISLATIVE MILL

Playing Cable Monopoly



by J. Patrick Michaels, Jr.
Communications Equity Associates
Tampa, Florida

During the period 1979 through the spring of 1982, there has been a tremendous turnover in ownership of the industry. While there are present indications of a softening in the market prices for existing systems, conditions are still conducive to a seller's market. The highly competitive nature of the acquistion process has created a unique opportunity for the experienced buyer. The essential reasons for this are as follows:

1. **Knowledge of the Market.** The active buyers are well known to prospective sellers and to cable TV brokers and investment bankers Hence, the aggressive buyers with an established track record are eagerly sought out and essentially enjoying a priority position with sellers or their intermediary. By being active in the marketplace, they are well aware of the prices being paid for various types of acquisitions. Additionally, acquisitions frequently result in chain reactions in that one acquisition may lead to other prospective sellers and/or buyers. For example: (a) satisifed sellers will frequently discuss their recent transactions with friends; (b) advertisements and press releases generate the interest and curiosity of prospective sellers and buyers; (c) buyers and/or their agents contact adjacent owners and franchise holders; (d) many times, several branches of a family will own different systems, and peer pressure can often provide inquiries from other family members; (e) also, most active buyers have well established industry contacts which are frequently rewarded with finder's fees.

2. **Ability to Move Quickly.** Many of the more aggressive buyers have a corporate organization specifically assembled to analyze and negotiate transactions. Once an opportunity is discovered they can move very swiftly. Most importantly, the senior decision-making process has been streamlined for acquisitions, and there are no lengthy delays in reaching critical decisions. Also, the most successful buyers have established corporate goals and philosophies which do not have to be reassessed with each prospective acquisition. Finally, they generally have well thought out criteria for analyzing acquisitions, as well as sophisticated computer programs to expedite the analysis process.

3. **Access to Financing.** Many of the successful buyers are well capitalized and financed, and generally do not rely on deal by deal third party financing. Those that must, such as the syndication groups, are willing to put up sizeable amounts for good faith deposits or non-refundable option fees. In this era of high rates of interest, sellers are most concerned that buyers be financially qualified.

4. **Flexibility.** The successful buyer will be able to structure offers to accommodate the seller's needs and desires, as well as tax considerations, yet still conclude a transaction on a favorable rate of return basis. Part of the ability to be flexible is a result of sophisticated knowledge of the market, which results from doing many transactions, coupled with sophisticated tax expertise. This knowledge of the market and tax expertise may also be obtained by dealing with a reputable and knowledgeable investment banker/broker.

5. **Knowing the Competition.** More and more frequently, prospective acquisitions come to market without an asking price. If the properties are brokered, the selling process generally becomes a sophisticated auction. In this circumstance, it is important to know who the competitors are that are interested in the property and what their criteria are

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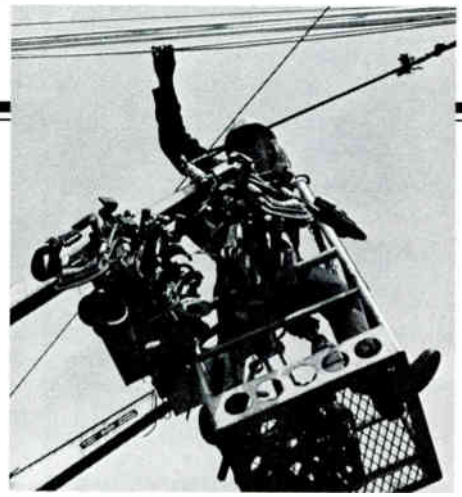

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in their evaluation process.

6. **Knowledge of the Broker (where applicble).** Unlike most industries, there are very few reputable brokerage and investment banking firms which specialize in cable television. Two firms controlled the majority of all the acquisitions and mergers in the industry in 1981, estimated at a value of $1 billion. These firms generally enjoy a good reputation, although they are very competitive among themselves, particularly the top two firms which have a lion's share of the deals. These firms each have their own corporate personalities and industry alliances. In addition, each firm is composed of many investment bankers and brokers with ranging degree of contacts, knowledge and expertise. Most active buyers maintain continuing contact, if not contractual relationships, with these companies.

7. **Psychology of the Market.** The most difficult ingredient of the acquisition and merger game in cable television is understanding the ever-changing psychology of the buyers and sellers, and their thinking regarding demand and supply; the availability and price of financing; stock market conditions; perception of future services; the regulatory atmosphere; technological changes; competition in franchising, construction and rebuild costs; effect of the activities of certain key buyers; perception of Wall Street analysts; condition of the equity markets; current tax laws and predicted future changes; and the independent operators own thinking of seeing themselves as a long term player in a growth industry or vanishing breed in an industry they no longer know. Added to this list should also be considerations such as trade magazine reports on sales and mergers; reports by industry analysts, such as Paul Kagan; trade show seminars; the impact of decisions being made by large MSO's regarding acquisitions; and finally, the psychology of the buyers not yet active in the industry.

Once an understanding of the marketplace and those factors affecting it are fully comprehended

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relative to both the industry as a whole and how these influence a particular potential seller, then an analysis of the particular cable system or company comes to bear.

1. **Rules of Thumb are Dangerous.** Each system and/or franchise has its own unique characteristic and must be analyzed on an individual basis. Even though comparative yardsticks such as cost per subscriber, cost per combined subscriber or multiples of cash flow have become the coin of the realm, they generally are not useful for acquisition analysis. The problems of arriving at a definition of subscribers or cash flow have become almost ridiculous. For example, when one talks about a subscriber, is it a basic subscriber, an EBU, FCC equivalent subscriber, pay equivalent subscriber, combined subscriber, etc.? With regard to cash flow multiples, is the definition one of trailing cash flow, annualized cash flow, projected cash flow, reconstitued cash flow, cash flow after deduction for maintenance oriented capital expenses, etc.?

Another dangerous rule of thumb is cost per home passed by cable. For example, what kind of cable plant is there — 12-channel, 36-channel, 52-channel; with or without convertors; type of security? Have headend and/or home office costs been allocated on a per mile basis? Some other key questions are what type of homes — high rise apartments, individual homes, low cost government subsidized housing, mobile home parks? How many dwelling units are within 150 feet of distribution and how many can be classified as legitimate plant extensions? Are there any impediments to obtaining access to rights-of-way either public or private? Have multifamily units been cabled properly? Are homes not passed by cable plant but within the franchise area readily available?

2. **Real Market Prices are Difficult to Ascertain.** It is almost impossible to ascertain what market prices are really being paid on an industry-wide basis, except in the acquisition of public companies. Unlike the broadcasting business, the FCC does not require the reporting of the selling price of cable systems. In a few instances in certain states with regulation at the state level, there are requirements for disclosure which are a matter of public record, however, as a whole, these figures are not widely publicized.

Since most of the acquisitions and mergers are handled through industry brokers or investment bankers, these firms are generally the only ones with a wide knowledge of the comparative prices being paid. In most cases, regardless of whether the broker represents the buyer or the seller, the brokerage firm is precluded by contract from revealing the prices and terms of any transactions. Additionally, very few buyers or sellers release details to the trade press.

Next to the brokers and the active buyers, the lenders that specialize in cable probably have the best knowledge of prices and structures; however, they are generally very reluctant to share corporate information, due to confidentiality requirements. Even the consultants and appraisers frequently have problems in obtaining accurate comparative information.

3. **Special Factors are Important.** It is a simple fact that each acquisition opportunity has its own unique characteristic, to some degree shaped by the sellers' goals and psychological make-up. This means that certain prospective buyers may have a competitive edge in certain types of transactions.

For example, some sellers will only consider a tax free exchange of shares with a certain type of company. Hence, this might rule out private companies, syndication groups, etc. for consideration. A typical example of this would be the fact that the incremental cash flow from an acquisition will usually be greater to an adjacent operator which would provide a competitive edge over non-colocated prospects.

An additional example involving more unusual circumstances, but a signficant one, would be the acquisi-

tion of a system very heavily saturated with mutli-tiers of pay. A large MSO who buys pay services at very substantial discounts, could automatically improve the cash flow of the acquired system by applying it's corporate discount. This would be particularly true if the acquired system was individually owned and paying the highest retail rates to the pay TV suppliers.

Finally, every contemplated acquisition has its own unique tax consequencies (as discussed in a previous article) which impact on the price and structure of the contemplated deal.

4. Structure and Pricing of Each Deal is Unique.

While most opportunities initially proceed on a cash for assets, or cash for stock basis, there has been an increasing flexibility on the part of sellers in recent months regarding the type and structure of acquisitions. This is, in part, due to the continued high interest rates, as well as the recent tax reforms, and perhaps to a gradual softening of prices to more realistic levels.

Obviously, the entity under consideration for purchase frequently defines the range of structures available. For example, in the case of purchasing a system owned by a partnership, the basic choices are the purchase of assets or the purchase of partnership interest.

Most sophisticated buyers are aware that the structure of an acquisition impacts on the pricing, and that the two are really inseparable. Any buyer of cable television systems would be well advised to retain the services of a law firm specializing in tax and/or an accounting firm with the same expertise.

While it is difficult, if not impossible, to cover this complex subject of pricing and structure in the scope of this article, it is possible to highlight some important factors.

With regard to establishing a price range based on alternative structures, it is first necessary to carefully analyze the prospective opportunity on the basis of what a buyer can realistically expect to do with the property. In general, the first year's projections should be heavily based on historical experience, except where major construction has recently been activated. This historical basis is prudent since it generally takes a great deal of time to realistically effect changes.

A model should be designed to incorporate all of the ingredients required to carry out the buyer's prospective management plan, including realistic schedules for subscriber growth, addition of new services, rate increases, cost of debt, attendant capital expenditures, etc., etc.

Once this has been accomplished, a detailed list of assumptions should be developed and refined. The first sets of cash flow projections should be run on these assumptions, using a basic cash for asset pricing with related tax consequences in the context of the buyer's structure. After refining these projections, a determination of the internal rate of returned base on discounted cash flows and assuming various price levels should be made to determine what pricing is acceptable.

The next set of projections should

look at other possible ways to structure the transaction. It is helpful at this stage to ascertain from the seller, or his agent, what other types of structures might be contemplated. This is the critical stage, particularly if the buyer is aware of the acquisition philosophy of potential competitors. It is almost always worthwhile to consider a price based on cash for stock if the proposed acquisition is a corporation, since this is generally the favored method of sellers.

In ascertaining alternative structures, it might also be worthwhile for a public company to consider a price on the basis of a tax-free exchange of shares when appropriate to the buyer's philosophy, as well as to the current market rate of the buyer's stock. This may also be possible for a closely held corporate buyer if there is some ability to provide liquidity to the seller. Also, it may be possible to look at a combination of stock and cash on a tax-free basis, as long as the proposed reorganization meets the IRS Code guidelines.

It is often wise to consider the possibility of assuming the seller's long-term debt. While this is generally precluded by most loan agreements, it is possible, on occasion, to find alternative long term debt at fixed, or attractive rates, which can be assumed. If one is buying stock, it is important also to consider any prepayment penalties which might result under the loan agreement, in the event the lender may compel the borrower to repay the indebtedness.

Of course, the most attractive opportunity is in obtaining seller financing. This can take the form of long-term senior debt at an attractive rate, or in some cases, improving leverage by getting the seller to take back some subordinated debt. Creative financing can often result in giving the seller his "price," yet preserving the buyer's projected rate of return by the "present valuing" of the seller financing. In all cases, one must be aware of the IRS regulation regarding imputed interest if the interest on a note is less than nine percent (9%) per annum.

Until recently, the practice of using noncompete and consulting agreements for cable acquisitions has been relatively nonexistent. Noncompetes have become more popular since the reduction of the maximum tax on unearned income has been reduced from seventy percent (70%) to fifty percent (50%). Additionally, with franchise renewals becoming more competitive, there is more justification for a noncompete from a tax point of view.

Moreover, some sellers are becoming more inclined to accept consulting agreements as a form of compensation. In both cases, the consulting and the noncompete agreements. it is necessary to realistically justify the contract from an IRS point of view. If, in fact, the amount is too great a percentage of the deal, the IRS may classify the fees as part of the franchise price, possibly jeopardizing the deductibility to the buyer at some future date.

Another consideration in developing price and structure relates to the real estate holdings be-

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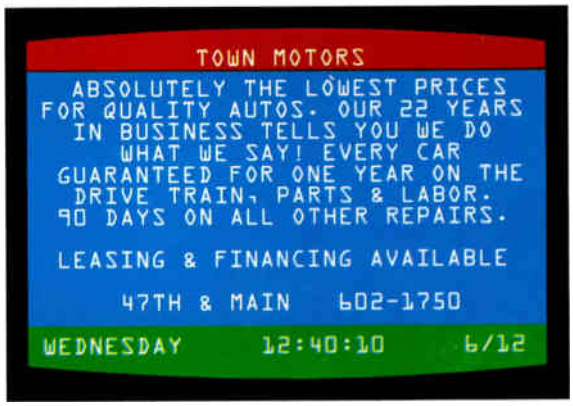

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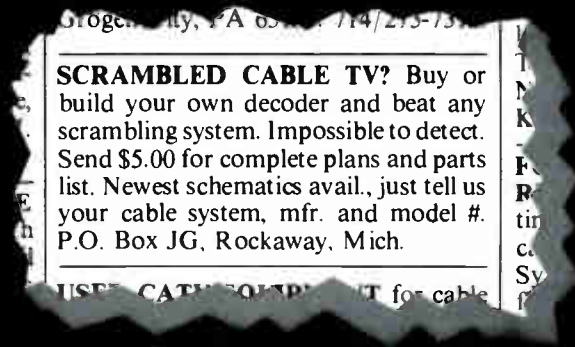
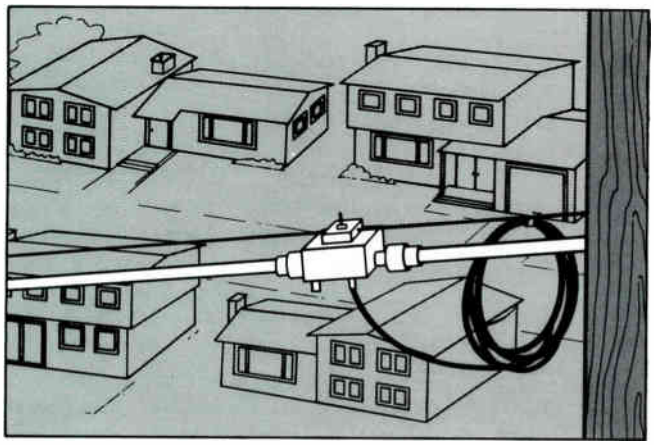


SCRAMBLED CABLE TV? Buy or build your own decoder and beat any scrambling system. Impossible to detect. Send $5.00 for complete plans and parts list. Newest schematics avail., just tell us your cable system, mfr. and model #. P.O. Box JG, Rockaway, Mich.

HOW TO STOP IT.



Vitek multi-channel traps provide more security for your premium channels.

No matter how sophisticated a scrambled Pay-TV security system is, as long as the service goes into a home, it's vulnerable. For once it's inside the home, subscribers can clip wires, un-do security screws, buy "black boxes" and come up with ways you haven't even dreamed of to take your Pay-TV service for a ride.

Industrywide, theft of service translates into an operator's nightmare of up to $140 million annually*. And as cable systems increase their Pay-TV services by adding 2, 3, 4 and more premium channels, the temptation to cheat will increase just as dramatically.

Trapping outperforms scrambling.

That's why major MSO's and independent cable systems alike are turning to Vitek traps to protect their programming and their revenues. They already know how trapping outperforms scrambling schemes in effectiveness and in reducing costs.

Traps are more effective because they can block out up to 4 separate channels or other combinations of tiers, *before* they enter the home. That eliminates the chance of cheating by subs who don't pay for the service. And, best of all, trapping means zero degradation for your pay subscribers, compared with reconstituted decoding techniques.

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Vitek is the most effective trap.

When it comes to Pay-TV security, the most effective method you can use is trapping. And the most effective trap is Vitek. That's why over a thousand cable systems are already using Vitek single and multi-channel cable traps to protect their revenues.

Make sure you maintain the profit in your pictures by calling Vitek today at (201) 287-3200—before anyone else tries to steal your show!

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Edison, N.J. 08817
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I am concerned about my Pay-TV revenues! I am interested in:

- ☐ Upgrading System
- ☐ Rebuilding System
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Name _____

Title _____ Telephone _____

Cable System _____

Address _____

City _____ State _____ Zip _____

Based on a Kagan report of monthly revenues in The Pay-TV Newsletter, April 30, 1981, and conservative estimates of a 10% piracy rate.

VITEK a subsidiary of AUGAT **VITEK Electronics Inc.,** 4 Gladys Court, Edison, N.J. 08817 Tel. (201) 287-3200

continued from page 12

ing acquired. If real estate is a significant part of the transaction, it may be that:

(a) the seller will keep the property and lease it to the buyer on a long-term favorable lease;
(b) the property can be sold to a third party and leased;
(c) the property can be acquired with seller financing; and/or
(d) the property can be financed on a more attractive third party mortgage than through conventional commercial financing.

Another alternative is the concept of purchasing less than one hundred percent (100%) of a venture. Many independent sellers are reluctant to leave the industry. They want to sell for a variety of reasons, yet if they could continue to participate in management and equity, they would consider a more favorable transaction from the buyer's point of view.

There is an increasing trend in the industry for certain MSO's to invest in smaller MSO's through the use of the partial buy-out or joint venture approach. This allows for the investing company to generally receive a position on far more favorable terms and acquiring 100% of the company. Often the smaller MSO or independent is able to obtain equity funds for acquisition, expansion, rebuild, construction of a new franchise, or to retire expensive senior debt at a rate far more favorable and with less effort and up front cost than through a venture capital firm. One additional major consideration is that this type of arrangement may also build in prospective buyers through a right of first refusal or other type of option to purchase arrangement.

Finally, it should be mentioned that there is a rapidly growing interest among the larger MSO's to consolidate their management districts and improve cash flow through the economies of scale generated through trading isolated systems for systems adjacent to existing operations. Traditionally, many MSO's have been hesitant to sell off or trade isolated properties because of franchising considerations. However, with major franchise contests rapidly drawing to a close, the industry will see a sharp acceleration of efforts by MSO's to consolidate through trades, as well as the selling of isolated systems and the acquisition of nearby properties. Although it is clear that we are entering into an era which will have some of the earmarks of playing Monopoly, many of the players will find that a great deal of sophistication and patience will be required, particularly in those transactions involving trades.

It is not possible within the scope of this short article, or even all of the articles in this series, to provide enough information to guarantee that a diligent reader will become an expert in the game of buying, selling and trading cable television systems. It is hoped, however, that the points covered in this series will give the reader enough knowledge to recognize the major considerations in dealing with what is often for sure, a decision of a lifetime. □

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

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

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

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

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ADDRESS _____

CO. NAME _____

ADDRESS _____

CITY _____ **STATE** _____ **ZIP** _____

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

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

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

cata

Membership Application

Please enroll my CATA system(s) in the COMMUNITY ANTENNA TELEVISION ASSOCIATION (CATA).

I understand that we have the right to cancel our membership at anytime. Please see that I receive all of the initial CATA material.

System Name _____

(group owner if any)

System Address _____

City_____ **State**_____ **Zip** _____

Individual Authorizing Membership _____

Telephone (_____) _____

About Your System—CONFIDENTIAL—For CATA use Only

1. Number of current subscribers (FCC count) _____
   Projected number of subscribers_____
2. Number of homes in franchise area____
   - ☐ Top 50 Market (35 mile zone)
   - ☐ Second 50
   - ☐ Smaller TV Market
   - ☐ Outside All Markets
3. Channel capacity_____
   System start-up date_____
4. Do you plan to build a TVRO earth station? ☐ Yes ☐ No
5. Congressional District_____

Note on Corporate Membership:

Dues for systems or MSOs with more than 16,666 subscribers are established with a dues limitation of $5,000 annually.

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SURCHARGE scale is $5.00 for systems with subscribers up to 500; $10.00 for systems with subscribers between 500 and 3500; $15.00 for systems with more than 3500 subscribers. The surcharge, PLUS 3 cents per subscriber per month determines the monthly dues charge.

Numbers of Subs_____

X .03_____

Sub Total_____

+ Surcharge_____

Total _____

PLEASE ATTACH CHECK FOR THAT AMOUNT WITH APPLICATION.

Personal memberships for those in related industries are available at $50.00 annual dues.

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When it comes to selecting an addressable system, it's like a forest. But once you know what to look for, it's easy to get out of the woods.

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The heart of addressable hardware is the computer. So you can't afford anything less than the best. That's why Oak addressable systems use an IBM Series 1 computer. It's famous for its reliability and nationwide sales and service backup.

In subscriber terminals, look beyond pretty cases and into performance. Look for things like a "favorite channel" memory for fast, easy tuning, parental control and durable membrane keyboard entry.

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Look at software performance.

See if it offers modular programs for you to pick and choose the kind of input and output you need. You want a system that takes into account versatile record access, allows entry to common menus with a single keystroke and interfaces with your billing system for highly efficient and accurate operation.

Make sure you and your software speak the same language. Your addressable system should have a simplified design with plain English menus, so your own people can be trained to use it quickly.

Finally, find the right suppliers.

Talk to someone who's thoroughly experienced in designing and building everything from 35 to 56 channel converters/decoders, and one- and two-way addressable systems. That way you'll get exactly what you need.

Only Oak Communications Systems (formerly Oak Communications CATV Division) has everything you're looking for in an addressable system. Backed by over 15 years in the cable TV business, Oak invented and introduced state-of-the-art addressability and has a proven track record of having the most addressable systems in operation in the U.S. today.

Now, here's how to get started.

For more information on Oak addressable systems, dial our toll-free phone number: 800/323-6556 (in Illinois 800/942-6345). Remember, when you buy an addressable system from Oak, you never have to worry about being lost in the woods.

Oak: The first choice in addressability.

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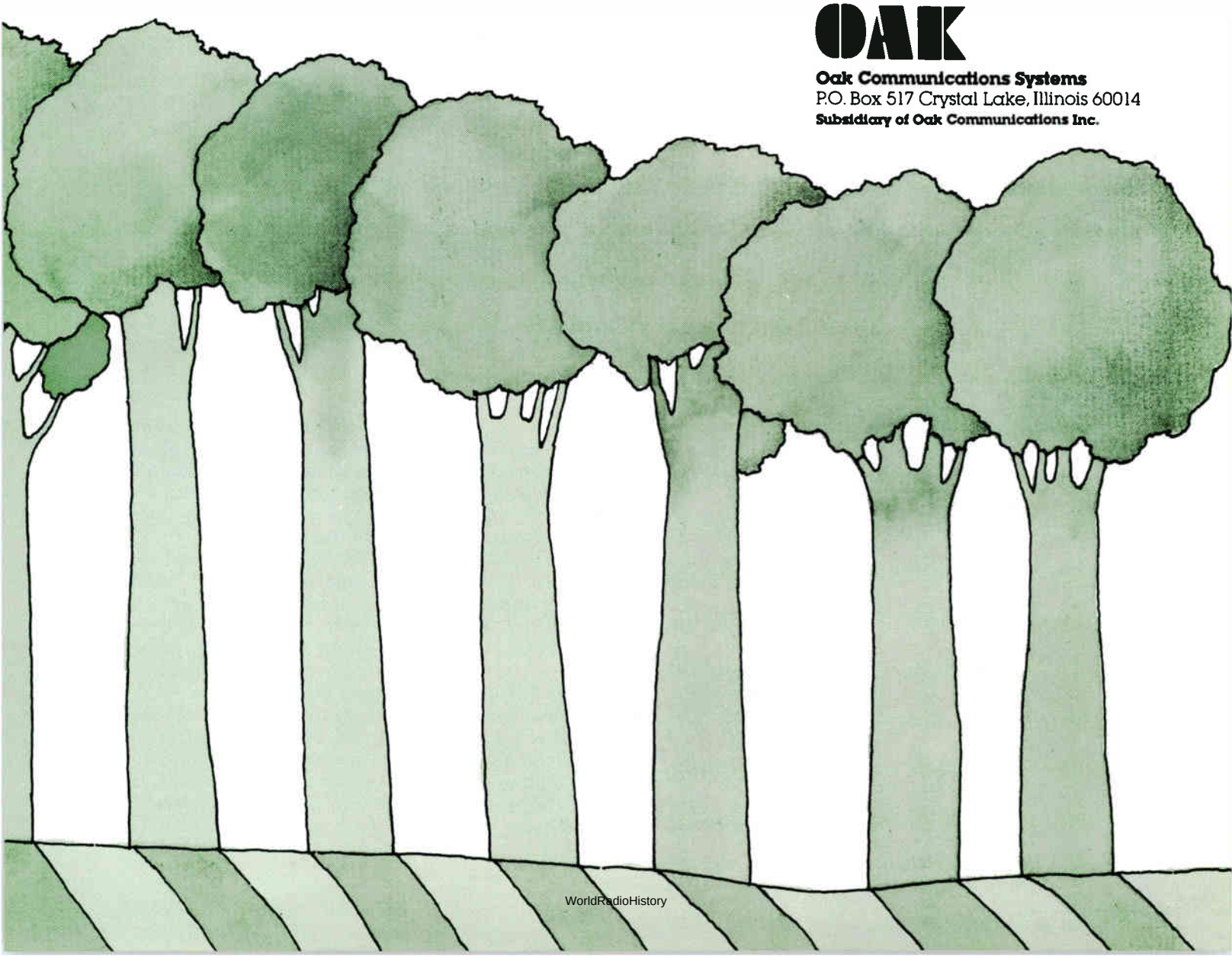


Letter

June 4, 1982

Ben V. Willie, President
CATA
4209 N.W. 23, Suite 106
Oklahoma City, OK 73107

Dear Ben

Your "CATATORIAL" about municipal ownership is right on target. I'm proud and glad you thought of this in the terms it really is. Anytime government gets into private enterprise its another step to socialism and we have already gone too far in that direction.

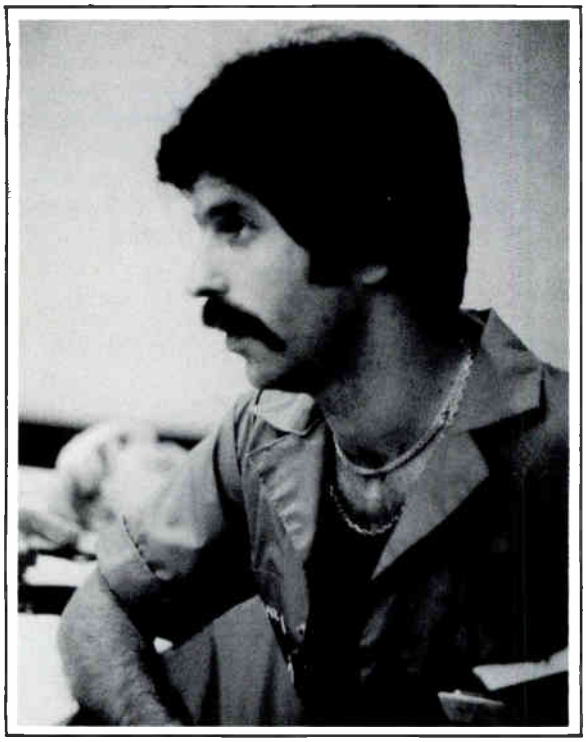
Thanks for a fantastic article. You have my vote and support.

Yours truly,

Bill Turner

Bill Turner, President
Welch Antenna Company

Memoriam



GENE FINK

1948-1982

Shock overcame us as we talked with our good friend, Danny Parsants, about the untimely death of his loyal friend and partner, Gene Fink. It is hard to believe that such a young life, full of warm personality and appreciation for his family, friends, and business associates, could be so quickly snuffed out. But we know what he would want us to remember.

Remember how happy his days were now — his wife, Jeannie, who was the love compliment to his life — his son, Adam, 11, in whom he found so much joy and pride — the pride in his and Danny's growing business and those employees who were helping to make it possible. Remember too how much he always enjoyed visiting with his friends how warmly he received them, and how interested he was to hear how things were with them.

Gene lived as a winner, and died in the same way. He and Danny were playng racquet ball; Gene went for a winning shot, and collapsed. Two doctors were playing on the next court, but it came immediately, and he was gone.

There is an emptiness, an open spot, a void, but life goes on and we have to adjust. More importantly, our lives were nicer because Gene Fink lived, and that is what he would want us to remember. □

A Serious Science-Fiction Fable Exposing Some of the Mythology Surrounding the Decibel

The Gravelizat

IN A TIME-LINE DIFFERENT FROM THE ONE

By Ken Simons
Consultant, WAVETEK

"LOG" is used on many hand calculators to mean "the logarithm to the base 10". It will be so used in this paper.

General Benjamin Washington was eating his favorite lunch of boiled spinach one day when he came down hard on a piece of gravel and broke one of his famous wooden teeth. He was angry! He called in the world renowned Philadelphia physicist and philosopher, Dr. George Franklin. "George," he said, "I want you to take immediate steps to control the gravel content in the army's spinach supply."

Dr. Franklin pondered a while, then he instructed the army commissary to issue a directive to the New Jersey spinach growers requiring them to limit the amount of gravel in their product to "0.03 parts by weight."

Unfortuntaely the growers were simple farmers who didn't understand decimal fractions, so they didn't comprehend what they were supposed to do. A clearer language was needed! Dr. Franklin thought this over for several days and finally came up with an inspired idea: "Even farmers can understand whole numbers;" he said, "we will restate the directive in this simpler way: First the grower must weigh a sample of the spinach. Second he must wash out the gravel, weigh it, and multiply its weight by 100. Third he must divide the spinach weight by this number. If the result is less than 3 he can sell the product to the army."

This idea worked fine. The growers were happy, the General was delighted, and Dr. Franklin was ecstatic! He liked this cute procedure so much that he decided to formalize it. "From now on," he said, "this process will be called 'Gravelization' and the unit in terms of which the result is expressed will be called 'Franklins.' Thus the gravelization of a given sample of spinach will be expressed in the following manner:

$$\text{Gravelization} = 100 \times \frac{\text{Weight of Gravel}}{\text{Weight of Spinach}}\ \%$$

(He introduced the symbol "%" (a sort of formalized letter "f") to indicate the unit "Franklins.")

Finally he made a statement which was to set the human race back at least a hundred years! "Because this procedure is so specialized," he said, "it may only be used **correctly** as a measure of the Gravelization of Spinach. No other use can be allowed or great confusion will result."

The years went by, and the weight of Dr. Franklin's prestige was such that almost no one dared to use "Franklins" (%) for any other than the prescribed purpose. There was, at one time, a rumor that some daring vice-president of Morgan Guaranty Trust was using it to express interest rates in a simple way, but this scandalous idea was quickly hushed up. So Savings and Loan Associations explained that their interest rates by stating that they would "give back each year six cents for each dollar invested." Weathermen, on a damp day would say, "the humidity is fifteen-sixteenths," and the President would brag about the success of his economic program by saying that the Gross National Product had increased, in the preceding year, "by one eighty-second part." So — in **that** time line — due to Franklin's prohibition, the human race was deprived of the tremendously convenient technique of multiplying any inconveniently small ratio by a hundred so that it could become an easily-expressed number (usually an integer) and called "percent."

Happily this is not the way it came about in **our** time-line. Today millions of bankers, students, financiers and housewives simplify their everyday lives by the use of "percent" for a wide variety of purposes. They are blissfully unaware of the fact that, by some quirk of fate involving Washington's teeth, they **might** have been deprived of this convenient device. Unfortunately, however, something very similar **did** happen in our technical history, and it did result in a senseless restriction on the use of the "decibel" idea — a mathematical

ion of Spinach

WE'RE IN — THIS COULD HAVE HAPPENED:

trick very similar in effect to the "percent" idea, and potentially even more useful!

In the mid-1920s a group of engineers working on the Bell Telephone Laboratories became concerned with finding a more convenient way of expressing the "transmission efficiency" on their telephone lines — the effect, very important on those lines, which causes the signal to get weaker as the line gets longer. The fundamental measure of this effect is the ratio of the electrical power coming out of a given section of line to that which goes into it. Finding the cumulative effects of several such sections in succession is inconvenient because it involves multiplying these ratios together. To get around this these engineers decided to use logarithms. After several false starts (involving the "Transmission Unit" and later the "Bel") they decided to define a property of the line called "attenuation" which was measured in "decibels". The number of decibels of attenuation in a given line section was defined as ten times the logarithm-to-the-base-ten of the ratio of the input power to the output power (or, what is the same thing, the logarithm to the base "the one-tenth-root-of-ten" of that ratio).

This choice had several very convenient features. The change in loudness at the receiver corresponding to a one decibel change in attenuation (a ratio of input to output power of the tenth-root-of-ten, or 1.2589. . .) happened to be about the least change detectable by the human ear. Thus, for most purposes, attenuation figures could be expressed as integers with adequate accuracy. The greatest convenience, however, resulted from the fact that the attenuation numbers expressed in decibels are logarithms, and to find the total attenuation of several successive sections of line it is necessary only to add the decibel attenuation numbers. Thus a section with an attenuation of 5 decibels (a power loss of 3.2) when followed by a section with an attenuation of 7 decibels (power loss of 5) would give a total attenuation of 7 + 5 = 12 decibels (since 3.2 x 5 = 16, and ten times the logarithm-to-the-base-ten of 16 is 12).

The real tragedies, the things that "set the human race back a hundred years" in **our** time-line were a number of unfortunate misconceptions and mis-usages which developed in relation to the decibel. With the enormous prestige of the Bell Laboratories behind them (although that organization was responsible for only a few of them) these "myths" have persisted for more than half a century. Their existence has limited the use of the decibel concept to a tiny fraction of what it might have been had the subject been clearly understood.

Some of the worst of these myths are the following:

Myth Number One: "The Decibel is a UNIT in terms of which a quantity called 'Attenuation' is measured."

THIS IS NOT TRUE! Attenuation, like length or voltage is a 'Physical Quantity', i.e. a measureable property of some physical system. Unlike length (which requires a standard like one foot or one meter), or voltage (which requires the definition of a standard volt) no standard is required to measure attenuation.

No standard is required to measure the loss of a piece of cable, for example. If the output power is found to be 1/10 of the input power, it doesn't matter whether those two powers are measured in watts, milliwatts, or, for that matter horsepower! If that ratio is 0.1 we can so state, we can say "The output power is 10% of the input power.", or we can say "The attenuation is 10 dB." In all three cases we have supplied precisely the same information about the loss of the cable, we have just used different number languages to get it across.

In none of the three cases was a unit involved. When we say "The output power is 10% of the input power." we add the funny little sign "%" to show that the actual ratio is found by dividing the number "10" by 100, we turn the uncomfortable

continued

fraction "0.1" into a comfortable integer "10%" so we can talk about it more easily. When we say "The loss is 10 dB." we put the funny little abbreviation "dB" after the 10 to show that that number was found in a very special way — i.e. by taking the actual ratio of output power to input power (10), taking its LOG (giving 1), then multiplying the result by 10. Why did we go to all this trouble? Because it gives us a number language that is very convenient when dealing with losses or gains in communications equipment.

Myth Number Two: The Notations "dBmV", "dBm", and "dB uv/m" are "Incorrect".

NOT TRUE! Although some international committees think otherwise (Ref. 1), the fact that these abbreviations have been used for almost 50 years, and their meaning is understood throughout the technical world makes them correct! Every engineer who sees it knows "dBm" means "the ratio of the given power to one milliwatt, expressed in dB". How then can it possibly be incorrect? As any student of language knows, the correctness or incorrectness of a word is not determined by the people who write dictionaries, but by the people who use words. The dictionary simply reports what words are used, and what it shows changed as the language changes. Fifty years ago "thru" was incorrect, a misspelling of "through" — today it is universally used.

Myth Number Three: dB Language Cannot Properly be Used to Express the Size of a Physical Quantity

NOT TRUE! Those that hold this view (see (1) and also (2)) are, in my humble opinion, simply confused! A clear-headed view of the subject will, I think, reveal that a number, expressed as a LOG, is still the same number. LOGs are just one of many possible number languages. The following statements convey **precisely** the same information (except for the rounding of the decimals implied in the last two):

The number of cows in the field is VIII.

There are 8 cows in the field.

There are eight cows in the field. (The **symbol** changes, not the meaning.)

The cows in the field are 10% of a herd of 80 cows.

The LOG of the number of cows is approximately 0.9031.

The decibel ratio of the number of cows in the field to the herd of 80 is 10 dB.

The second statement is certainly the most **convenient,** they are all **correct.**

Any statement reporting the result of measuring a physical quantity must include, in some form, two essential pieces of information: the number (expressed in any convenient numerical language) and the unit in terms of which the measurement was made. It is completely meaningless to say "The height of the tower is 200." We must say 200 somethings — 200 **metres,** 200 **feet,**

continued

200 **inches.** The second part of the statement has as much to do with the size we are stating as the first, and can't be omitted. For the same reason, in stating levels in a TV system we cannot say "The level is 38 dB." We have indicated only what number language we are using, and what the number is stated in that particular language, but we must also say in terms of what unit of power the measurement was made. "The level is 38 dB." is a statement as meaningless as "The height is 200." It makes almost 50 dB of difference whether we say "The level is 38 dBmv," or "It is 38 dBmW!" (I fully agree with Ward (2) that we should express decibels with a reference of one milli-watt as "dBmW" rather than as "dBm." The letter "m" is universally used as a symbol for metres, whereas the abbreviation "mW" is equally accepted as the symbol for milli-watts. If the reference is one milli-watts the symbol should be "dBmW.")

The following statements all mean precisely the same thing (again excepting for the rounding implied in those statements involving LOGs).

1. The power output of the transmitter is 200 watts.
2. The power output of the transmitter is 200,000 milli-watts.
3. The LOG of the power output of the transmitter in watts is 2.3010.
4. The power output level of the transmitter is 53 dBmW.
5. The power output level of the transmitter is 102 dBmV.

Notice that, although the amount of power described in each case is the same (within the limits of accuracy set by the form of expression), the number, in each case, is different! In the first two cases we did not have to indicate what number language we were using, since Arabic numerals have become pretty widely accepted in the last 1000 years or so! We did have to indicate the power unit involved. In the last four cases we had to indicate not only the unit of power, but also the number language being used, since in those cases the languages were not usual. The word "LOG" in case 3, and the abbreviation "dB" in cases 4 and 5 are completely essential parts of the **number** in those cases, since they tell us what

number language is being used. The word "watts" in case 3, and the abbreviation "mW" and "mV" in 4 and 5, are equally essential, since they let us know in terms of what basic unit of power the measurement was made.

Myth Number Four: People Prefer "Real" Numbers to Logarithmic Ones

Many years ago I received a letter in regard to logarithms in which the writer said "I don't like those logarithmic expressions, **people** prefer **real** numbers." (my underlines.) Words like "proper" and "improper", "real" and "unreal," have no place in a discussion of what symbols best represent the results of a measurement. The symbol "2" describes this many asterisks ** to us simply because long ago a group of men got together and agreed that it should. Another group of men got together at a later time and agreed that the symbol "3 dB" meant essentially the same thing as the symbol "2." Neither symbol is more "real" nor more "proper" than the other, it is strictly a question of convenience. If we are counting cows in a field, the use of Arabic numerals is certainly indicated. For expressing the measurement of power levels in a CATV system the dB language is infinitely more convenient. Try telling a CATV technician that a level of 40 dBmV is less "real" than a power of 133 micro-watts!

What you **will** find, if you observe human behavior rather than listening to learned scientists, is that people do prefer numbers in the simplest possible form. This is why we use percent, "6%" is easier to say, and to use, then ".06." This is why the Metric System has such an enormous family of prefixes. "Two millimeters" is the same distance as ".002 metres," but the use of the prefix makes the number simpler. This is the whole reason for the existence and popularity of the decibel; it allows the expression with very simple numbers (usually integers) of very large power ratios, and, with a suitable power refer-

continued

ence, of very small, as well as very large, amounts of power.

Myth Number Five: The dB Can Only Properly be Used to Express Power Ratios

NOT TRUE! What is proper? Are we going to say that the acoustics engineers who express **power density** ratios this way have been doing something wrong for the last 40 years or more? Are we going to say that the Broadcaster is not "allowed" to express Field Strength in dBs in relation to one micro-volt per meter? Power density ratios are not the same thing as power ratios; field-strength ratios are not power ratios; and yet the decibel variety of numerical language is used, and used with great benefit for these purposes! Let's bring the dB out from under the table and recognize that it is available for any use we care to put it to, as long as we remember that "dB" means **only** "the preceding number was found by taking the LOG of another number and multiplying by 10" and are careful to say to what that other number applies. (3) The director of the Harvard Psycho-Acoustic Laboratory proposed in 1955 that the dB scale be applied to Optics (4). It is one of the tragedies of our time that nobody paid any attention. We are stuck instead with measurements relating to the "Candela", concerning of which Danloux-Dumesnils says in his marvelous book "The Metric Syustem" ". . . the official definition **which gives it the spurious appearance of being a physical unit,** is insufficient . . ." (5) (my underline).

Myth Number Six: (The worst of the lot!) **Gain or Loss is Equal to 20 Times the LOG of the Voltage Ratio**

NOT TRUE! To be precise TRUE ONLY IN SPECIAL CASES! The confusion probably arises from the fact that, when decibels were first used there were, in telephone practice, no power meters. Lacking them, measurements were made with voltmeters. Power loss was determined by measuring the line voltage at two points, squaring the voltage ratio and finding the dB loss by taking 10 times the LOG of the resulting number.

Since the line impedance was always 600 ohms, the power at various points was proportional to the square of the voltage ratio, so this worked. Unfortunately someone found a shorter way to do it!

Let P_{in}, V_{in}, and R_{in}, represent the input power, input voltage, and input resistance, respectively, of a section of transmission line. Similarly let P_{out}, V_{out}, and R_{out} represent the corresponding output parameters. The loss of this section is then $10 \text{ LOG} \frac{P_{in}}{P_{out}}$ dB. But $P_{in} = \frac{V^2_{in}}{R_{in}}$ and $P_{out} = \frac{V^2_{out}}{R_{out}}$. If these values are substituted in the loss expression, the result is:

$$\text{Loss} = 10 \text{ LOG} \left[\frac{V^2_{in}}{R_{in}} \times \frac{R_{out}}{V^2_{out}} \right] \text{dB}.$$

Here's where the short-cut becomes possible: If, **and only if,** $R_{in} = R_{out}$ (as it usually does in telephone systems) $\frac{R_{out}}{R_{in}} = 1$ and

on page 36

At $695, SAM Jr. isn't the lowest-priced signal level meter you can buy. But it's the only low-priced meter that doesn't ask you to make sacrifices.

You don't have to give up performance with SAM Jr. The ±.75dB amplitude accuracy is lots better than the closest competitor. And it holds for the entire −35 dBmV to +60 dBmV range.

SAM Jr. doesn't ask you to compromise reliability and construction, either. The drawn aluminum case is tightly sealed and has a lexan-clad backprinted panel. Everything about SAM Jr. is built to take all the banging about a signal level meter has to expect. And it weighs less than 6 pounds.

SAM Jr. is available in a VHF version that covers 10 to 300 MHz in five bands of all-electronic tuning. (No adapters or compensators are needed). A 450 MHz range extension is optionally available. If you need to go even higher, we have a UHF version that covers the 470 to 890 MHz spectrum.

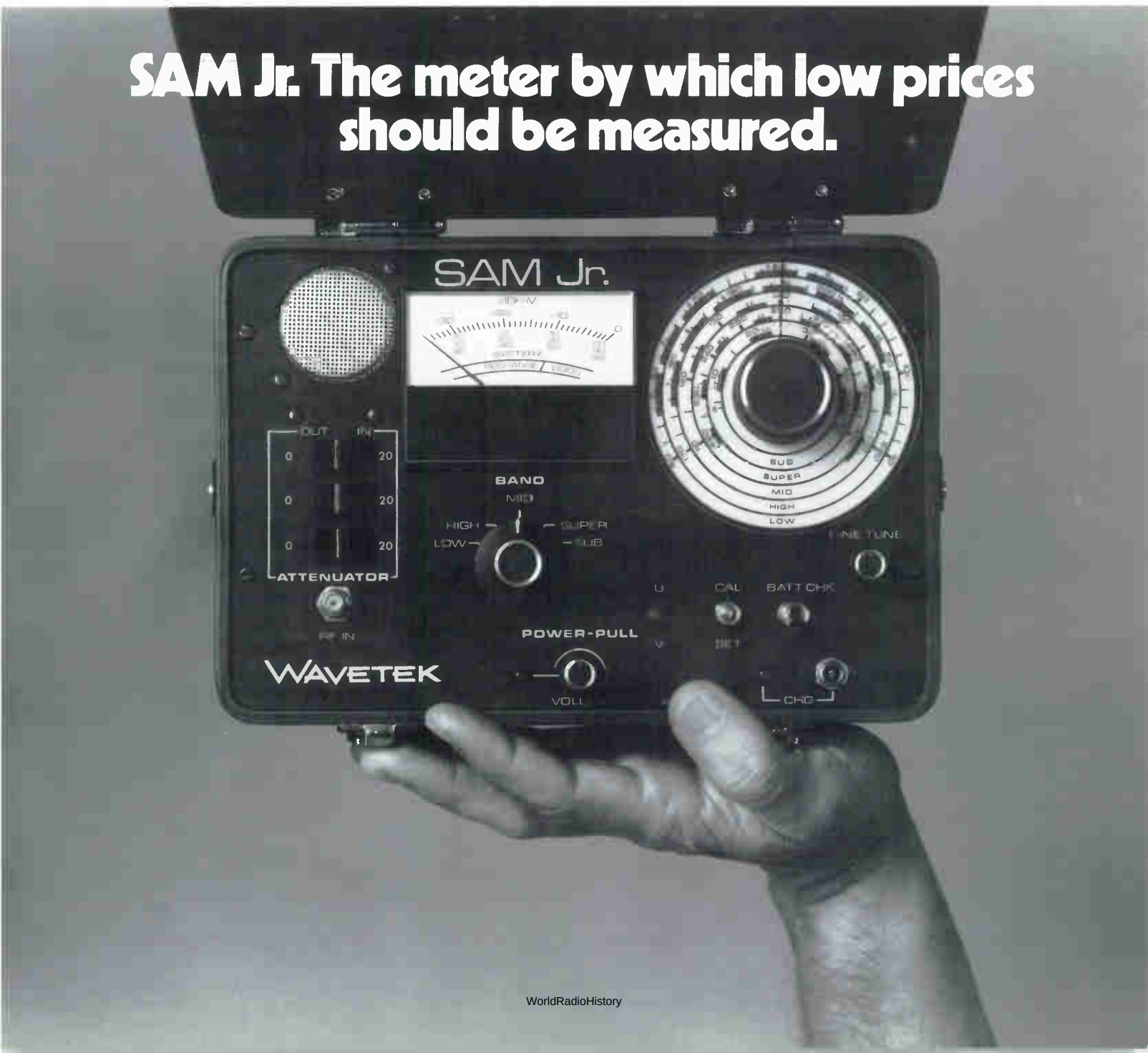
Another thing to remember: SAM's price includes rechargeable batteries and charger—usually offered as options on other meters.

Sure, you can pay a few dollars less for a signal level meter. And pay, and pay, and pay.

For details, contact Wavetek Indiana, Inc., 5808 Churchman, P.O. Box 190, Beech Grove, IN 46107. Phone Toll Free 800-428-4424. In Indiana (317) 787-3332. TWX 810-341-3226.

WAVETEK®

SAM Jr. The meter by which low prices should be measured.



Keeping Up With The Birds

BY: Ralph A. Haimowitz
CATA's Director of Engineering

One of the most difficult tasks for cable operators is staying current on satellite programming. With all of the changes, additions, deletions, new satellites, etc., it becomes almost as comic as the old Abbot and Costello baseball routine of "Who's on First?" CATJ will continue to print update information on satellite services approximately every quarter, but we sometimes find that changes occur even between the time that the information is assembled for an article and the time that the issue is printed and distributed.

In this update of satellites and program services we have listed those changes that **should** have taken effect by the time this issue of CATJ is in the reader's hands.

SATELLITES

RCA AMERICOM

Satellite	Location
SATCOM F1	135.0* W
SATCOM F2	119.0* W
SATCOM F3	131.0* W
SATCOM F4	83.0* W

WESTERN UNION

Satellite	Location
WESTAR W3	91.0* W
WESTAR W4	99.0* W
WESTAR W5	123.0* W

COMSAT GENERAL

Satellite	Location
COMSTAR D1/D2	95.0* W
COMSTAR D3	87.0* W

TELSAT CANADA

Satellite	Location
ANIK B	109.0* W
ANIK 2/3	114.0* W

SATELLITE PROGRAMMING

SATCOM F3 VIDEO SERVICE

TR. #	SERVICE
1	Nickelodeon
1	ARTS
2	PTL
3	WGN
4	Spotlight
5	The Movie Channel
6	WTBS
7	ESPN
8	AETN
8	CBN
9	USA Cable Network
14	CNN
15	CNN 2
16	HTN Plus
16	ACSN
16	Good Stuff
16	NJT
17	Cable Health Network
18	Reuters Monitor Service
19	C-Span
20	Cinemax (E)
21	HTN Mini Service

9	BET
10	Showtime (W)
11	MTV
12	Showtime (E)
13	HBO (W)
22	The Weather Channel
22	MSN
22	Daytime
22	USA Blackout Network
23	Cinemax (W)
24	HBO (E)

WESTAR 4 VIDEO SERVICE

TR. #	SERVICE
5	CBS Cable
6	SIN
8	Satellite News Channel
10	FNN
10	Selec TV
11	Satellite News Channel
14	Satellite News Channel
16	Satellite News Channel
18	Satellite News Channel
19	EWTN
19	EROS
22	SPN
24	GalaVision

WESTAR 5 VIDEO SERVICE*

TR. #	SERVICE
3	WOR
—	CBS Cable
—	SIN
—	Satellite News Channels

*Note: These services will relocate from WESTAR 4 when WESTAR 5 becomes operational. WESTAR 5 is scheduled for launch June 5, 1982.

SATCOM F3 AUXILIARY SERVICE

TR. #	SERVICE
2	Satellite Radio Network
3	WFMT-Chicago
3	Bonneville Broadcasting System
3	Seeburg/Lifestyle Music
3	Electronic Program Guide
3	Satellite Music Network
3	Moody Broadcast Network
6	Dow-Jones Cable News
6	North American Newstime
6	Reuters News View
6	UPI Cablenews Wire
6	View Weather
6	SSS Cable Text
14	CNN Radio Network

SATCOM F4 VIDEO SERVICES

TR. #	SERVICE
6	Bravo
7	Escapade
7	NCN
8	The Entertainment Channel
17	TBN
18	HBO (E)
19	The American Network

SATCOM F4 AUXILIARY SERVICE

TR. #	SERVICE
6	Bravo
7	Family Radio Network (E)
7	Family Radio Network (W)

WESTAR 2 VIDEO SERVICE

TR. #	SERVICE
2	Independent Network News

ANIK - B SERVICE

TR. #	SERVICE
6	CBC North
8	CBC French (EST)
10	CBC North/English (AST)

ANIK 2/3 SERVICE

TR. #	SERVICE
1	CANCOM CHAN (PST)
3	CBC Parliament/French
4	CANCOM CHCH (EST)
8	CANCOM/FRENCH (EST)
10	CANCOM CITV (MST)
12	CBC Parliament/English

SATELLITE LAUNCH SCHEDULE

LAUNCH DATE	SATELLITE	LOCATION
August 12, 1982	ANIK AD	104.0* W
November 1982	ANIK AC	—
November 1982	SATCOM F5	—
March 1983	SATCOM FIR	139.0* W
May 1983	Galaxy G1	—
July 1983	Telestar T3A	—
September 1983	Galaxy G2	—
October 1983	SATCOM F2R	—
February 1984	Spacenet S1	—
May 1984	Telestar T2B	—
June 1984	Galaxy G3	—
July 1984	Telestar T3C	—
July 1984	Spacenet S2	—
June 1985	Spacenet S3	—

PROBABLE FUTURE PROGRAM SERVICES

DATE	SERVICE	SATELLITE
August 1982	Satellite News Channels	Westar 5
August 1982	WOR	Westar 5
August 1982	Kid Vid Network	Unknown
Mid 1982	UTV Involvision	Satcom F4
Mid 1982	Cinemerica	Unknown
September 1982	The Cable Newspaper	Unknown
September 1982	RCA Ad Supported Network	Unknown
October 1982	Black Music Television	Satcom F4
October 1982	Home Music Store	Westar 5
October 1982	Biz Net	Unknown
Late 1982	FEP/SSS Telectext	Satcom F3
Late 1982	Family Entertainment Network	Satcom F4

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Haimo Wits

RALPH HAIMOWITZ, CATA'S DIRECTOR OF ENGINEERING

A lot has happened in the past two months that has involved the Engineering Office. In March, we attended **Southcon,** a high technology electronics exhibition and convention, in Orlando. Southcon was a huge show with two full exhibit halls and five days of workshops and seminars. The three days of seminars and registration were free, while the five day workshops were individually priced from $125 to $200. Although this show is aimed toward the Department of Defense and major electronics contractors and manufacturers, a small amount of the material presented could be of interest to those of us in the cable industry, such as the workshop on Electrical Protection of Computers and Other Electronic Equipment Exposed to Power and Lightning Surges.

In the exhibit halls there was an abundance of computer hardware and software displays, including mini and micro computers, EDP peripherals, data communications, control systems, and test equipment. Other exhibits had components, microelectronics, fiber optics, and production and packaging equipment.

We found several displays of surge protection equipment, connector security, and test equipment that were of interest, and many of these product manufacturers had a line of items for CATV. For those of our readers who may be interested in this type of show, **Wescon** will be held in Anaheim, CA. Sept. 14-16, **Midcon** in Dallas, Texas Nov. 30-Dec. 2, and **Southcon** in Atlanta, GA. Jan. 18-20. To receive a brochure on any of these call 800-421-6816.

We held our first basic seminar in Oklahoma City, April 5-7, and it was very well received. Some attendees who were new to the cable industry stated that this seminar gave them an excellent understanding of cable television and how it works. A large number were technicians and installers, in our industry up to two years, who expressed the opinion that this seminar gave them a better understanding of their jobs and would improve their effectiveness and job performance. One attendee stated that he found the course to be much more informative than he had expected and that perhaps we should call it an **Intermediate** rather than a Basic seminar. Regardless of the terminology, the Basic Seminar seems to fill the need for training of those cable technicians who have yet to reach the level of Senior Systems Technicians, and provide the knowledge required to understand the material in the Advanced Technical Seminars better.

The seminar in Oklahoma City also gave us the opportunity to visit the expanded offices of the CATA Administrative Office and the facilities of CATJ Magazine. The entire staff made us feel right at home and helped us in every possible way to make our seminar a success. CATJ was in the final stages of layout for the May issue and we were able to see and understand the tremendous job that these people do every month. This staff is truly a group of skilled professionals and we take our hats off to them.

The Advanced Technical Seminar in Albany was at full capacity even though the NCTA show in Las Vegas was going on at the same time. We owe a great amount of gratitude and appreciation to the equipment suppliers who somehow were able to provide us with what we needed for the seminar when they also had to demonstrate their equipment at the NCTA exhibit hall. A super job, as usual, from this group! If it were not for their unselfish backing and support, we would not be able to present these seminars and accomplish as much as we think we are now being able to do.

One final comment about Albany. Several members of the New York State Cable Commission attended this seminar and we were impressed by their knowledge and dedication. This group performs an invaluable service to the cable systems in the state, providing assistance in every area to insure that the cable systems meet all of the state and federal requirements and regulations. They even go so far as to do the annual Proof-of-Performance tests for the smaller cable systems that do not have the expertise and equipment required for these tests. This Commission is there to help the cable systems provide proper service to their subscribers. We believe that this kind of organization in every state would be most beneficial to the cable industry. A very special thank you to the N.Y. State Cable Commission for making two of their vans available to our group to explain what they can do and show the sophisticated equipment that they have in use. □

Performance...Operator Efficiency...Maneuverability...

THE NEW 350SX: THE PLOW

The new Ditch Witch 350SX is a compact, mid-range lawn plow with new features that let it outperform and outproduce anything in its class.

The superior 350SX performance starts with Ditch Witch design: a variable speed shaker system delivers the force needed to maintain maximum blade movement at cover depths from 12 to 24 inches, and allows you to build to maximum power as soil conditions become more difficult. You'll hold your traction while you're doing it: greater weight — up to 4,250 pounds — and better weight distribution keeps the 350SX working when others slip or stall.

The 350SX is loaded with innovative features that make it a standout in its class . . . features that give you outstanding plow performance, more maneuverability, and greater operator efficiency.

New chute design and blade choice offer wide-ranging versatility. Handle delicate TV cable with a 10-to-1 bend on a floating chute. Standard telephone or electrical cable goes down efficiently through either fixed or floating chutes. Pull blades are available for plastic pipe. Cover depths for all blades are 12, 18 or 24 inches.

Unitrolley design provides a one-piece trolley for the shaker system for longer life and less maintenance.

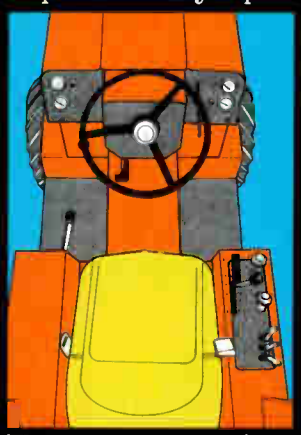
You get increased stability from the new hydraulic plow assembly. When moving into position, hold the plow assembly in place until you start to plow, then position it for best balance. There's no back-and-forth movement.

Standard 26-inch tires offer added stability and traction, and optional 23-inch high-flotation tires make the 350SX **the only machine in its class that can clear a 36" yard gate.** Maneuverability

Ditch Witch®

YOU'VE ALWAYS WANTED.

and control is increased by standard 4-wheel-steer: you can steer front and rear wheels independently, to work more effectively on slopes. Dual-lift cylinders provide the force required to vary depths in even the most difficult plowing conditions. The plow lift linkage provides greater blade clearance and allows a greater angle of departure on uneven terrain.



And the 350SX is "human engineered" for its operator. He sits in a rider module, facing the front. There's no body overhang, no awkward movements to reach the controls. They are grouped on the right rear fender in easy reach. The steering wheel is adjustable, up and down. Retractable seat belts add to the efficiency of operation. Maintenance is at a minimum, and the "instant-test" warning monitor offers early warning to potential problems.

Choose the 350SX with 35-HP-class diesel or gasoline engines, and equip it with optional reel carrier or horizontal boring attachment.

Call your nearby Ditch Witch dealer to arrange a demonstration. When you see it in operation, you'll understand what we mean: the 350SX is everything you've ever wanted in a plow — and more. The Charles Machine Works, Inc., P.O. Box 66, Perry, Oklahoma 73077

Ditch Witch.
Don't settle for less!

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the loss expression boils down to:

$$\text{Loss} = 10 \text{ LOG}\left[\frac{V^2_{in}}{V^2_{out}}\right] = 10 \text{ LOG}\left[\frac{V_{in}}{V_{out}}\right]^2 \text{dB.}$$

It is one of the principles of logarithms that

$$\text{LOG } X^2 = 2 \text{ LOG } X, \text{ so}$$

in this case (when $R_{in} = R_{out}$):

$$\text{Loss} = 2 \times 10 \times \text{LOG}\frac{V_{in}}{V_{out}} = 20 \text{ LOG}\frac{V_{in}}{V_{out}} \text{ dB.}$$

So for 50 years everyone has thought that, as soon as we are faced with a voltage ratio, we must multiply by 20 instead of 10! To restate the **only** case where this works: If we want the dB **Power** loss, **and** the input and output impedances are the same, then **and only then** we can say that the loss ("the loss" meaning the dB **Power** ratio) is equal to 20 times the LOG of the voltage ratio.

Some people have even used the "dBV," pretending that, to express a **Voltage** ratio in dB one multiples its LOG by 20! Why should we multiply the LOG of one kind of ratio by 10, and the LOG of another kind by 20? Suppose you wanted to express the ratio of the number of people in Paris to the number in New York City by dBs. Who would decide whether to multiply by 10 or by 20? If "dB" **always** means "the preceding number is 10 times the LOG of a certain ratio: all confusion is avoided.

Just to see the problem, consider an audio amplifier with an input resistance of one megohm which requires an input voltage of 10 millivolts to put out a power of 20 watts into an 8 ohm loudspeaker. What is its gain, expressed in dB? If my calculator is working right, 10 times the LOG of the **power** ratio is 103 dB, 20 times the LOG of the **voltage** ratio is 42 (I refuse to say "dB"!), and 20 times the LOG of the **current** ratio is 144! Can there be any confusion as to which number represents the "gain" of the amplifier? Do the second two results have, in fact, any useful meaning at all?

My case rests!

References

1. Chester H. Page "Logarithmic Quantities and Units" Proc. IEEE (Lett. October 1973, pp. 1516-1517. Replies by A. Ziermann, M.N. Lustgarten and K.A. Simons
2. William W. Ward "Another View of Dimensions and dB" Proc. IEEE (Lett.) Vol. 60 p. 743, June 1972. Reply by Bruce B. Barrow
3. K.A. Simons, "The dB-Anything" Proc. IEEE (Lett.), Vol. 61, pp. 495-496
4. S.S. Stevens, "Decibels of Light and Sound" Physics Today Oct. 1955, pp. 12-17
5. M. Danloux-Dumesnils "The Metric System" published by the Athlone Press of London 1969 p. 121 □

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DATE	SERVICE	SATELLITE
Late 1982	HBO	Satcom F4
Late 1982	Warner Amex	Satcom F4
Early 1983	The Disney Channel	Westar 5
Early 1983	WOR	Westar 5
1984	Southern Baptist Network	Spacenet 1
1984	Classic Movie Channel	Spacenet 1
1984	Women's Programming	Spacenet 1
1984	Talk Show/How To	Spacenet 1
1984	International Network	Spacenet 1
1984	The Pop Network	Spacenet 1
1984	Midwest Radio and TV	Spacenet 1
Unknown	Univision	Westar 4
Unknown	KUSK-LPTV Network	Unknown
Unknown	Shopping By Satellite	Unknown
Unknown	Don Krishner Network	Unknown
Unknown	Video Music Channel	Unknown
Unknown	CSPANN (Senate)	Satcom F3
Unknown	Gamma	Unknown
Unknown	USA Today	Unknown
Unknown	Future	Unknown
Unknown	PBS Cable	Unknown
Unknown	Window	Unknown
Unknown	PET	Unknown
Unknown	Women's Sports Network	Unknown
Unknown	Don King Sports & Entertainment	Unknown
Unknown	CBS/Fox	Unknown
Unknown	Getty/ABC/ESPN Sports Network	Unknown
Unknown	Campus Entertainment Network	Unknown □

CCOS '82
Welcome to Nashville!

As you pick up this issue of CATJ, we are at the threshold of another CCOS, and CATA is pleased that you have joined us in the historic area of the Smoky Mountains of Tennessee. We sincerely hope this will be another memorable meeting for you, as you reacquaint yourselves with other CCOS attendees and their families, and the exhibitors who have also joined us.

If you are reading this issue at home, we are sorry that you did not join us in Nashville and hope that another year will present the opportunity to make it possible to be a CCOS attendee. Following, you will see in detail program information concerning the technical and management sessions, the list of Exhibiting Companies, information concerning the various functions aside from the sessions that were part of the festivities, and other details about ladies and family activities.

As you check the schedule of sessions, we hope that there is information being presented that will truly be an asset to you — something that makes this trip to Nashville and CCOS really worth it! We have acted upon program suggestions from former CCOS surveys and from comments made to some of the directors and officers as they have attended meetings over the country. As CATA's Director of Engineering, Ralph Haimowitz, who was responsible for the formation of the program and sessions, has traveled teaching his Basic and Advanced Technical Training Seminars, information concerning what material is needed has been apparent, and this hands-on experience has once again been brought back to the CCOS program.

In regard to the "hands-on" session on Spectrum Analyzers, we hope that you have made your reservation for this session. Space is limited in this area, and we don't want anyone disappointed about not being able to get in. If you haven't made your reservation, check at the registration desk to see if there are any slots left open.

Exhibit Hours

Sometimes it has been suggested that perhaps the seminars should be held without the Exhibit Hall, but so many of our attendees feel that this is their one time when they have the opportunity to examine new equipment and talk to the various vendors concerning new programming services or new technology. We feel it is important that the Exhibitors be part of the schedule, so our planning has included thirteen and a half hours of exhibit time so you can take advantage of their exhibits and their representatives. No sessions are planned during the Exhibit Hours, and no other scheduled events, so that there is no distraction for this time in the Exhibit Hall. In fact, on Monday and Tuesday, a Walking Lunch Sandwich Bar has been arranged, **courtesy CATJ Magazine,** for the seminar attendees so that they can grab their lunch between sessions and still take advantage of the exhibits. Liquid refreshments will be served, courtesy the Exhibitors, in Ryman Hall during each exhibit time for your enjoyment.

Check the schedule of Technical and Managements sessions, and make your plans to attend those most meaningful to you in your cable operation. We encourage the Exhibitors to participate in the sessions as well; we know many of them are relatively new to the cable business, and there are several sessions that would be of assistance to these "new-comers" to clarify basic terminology, identify equipment, explain testing, etc. The cable spouses are also invited to attend if they are interested in any of the sessions.

We urge you to participate in the Open Forum on Refranchising as this issue looms as a potential danger to cable operators over the entire country. There are incredible stories that are told concerning refranchising, and this session is critical to your management and something you shouldn't miss.

For CATJ readers who are not able to attend CCOS, we hope to have some of this information reprinted in the magazine so that you may have the advantage of this presentation.

To those of you with us in Nashville, again we extend a warm welcome and offer the hospitality of the South as you visit here. We will try to make your stay pleasant and profitable. Thanks for coming.

CCOS '82 SCHEDULE

SATURDAY, JULY 3RD

1:00 - 5:00 p.m. Registration Ryman Hall

4:00 - 6:30 p.m. EXHIBITS OPEN Ryman Hall
Drinks courtesy CCOS '82 Exhibits

8:00 - 9:00 p.m. WELCOMING RECEPTION Knoxville
Sponsored by GROUP W SATELLITE COMMUNICATIONS which brings you THE NASHVILLE NETWORK, SATELLITE NEWS CHANNELS, and THE DISNEY CHANNEL

9:00 p.m. Buses leave for Grand Ole Opry

9:30 p.m. Grand Ole Opry Performance Opry House

SUNDAY, JULY 4TH

10:00 a.m. Opryland Theme Park opens
Celebrate the 4th of July!!

1:00 - 4:00 p.m. Registration Ryman Hall

4:00 - 7:00 p.m. EXHIBITS OPEN Ryman Hall
Drinks courtesy CCOS '82 Exhibitors

7:30 - 9:00 p.m. CATA Membership Meeting Cumberland

MONDAY, JULY 5TH

Management Sessions

9:00 - 10:00 a.m. SOLVING BAD DEBT PROBLEMS Natchez Trace
Michael Angus
Transworld Systems, Inc.

10:00 - 11:30 a.m. SURELY INSURED Natchez Trace
Linda Jones
Farmers Union Insurance Co.
Bill K. Webb
Franey & Parr Insurance Co.

Technical Sessions

9:00 - 11:30 a.m. WHAT IS A CABLE SYSTEM? Knoxville A
Ralph Haimowitz,
Director of Engineering, CATA

9:00 - 11:00 a.m. LET'S ANALYZE THE SITUATION Judges' Parlor
Raleigh B. Stelle III
Texscan Corporation

12 Noon - 2:00 p.m. EXHIBITS OPEN Ryman Hall
Sandwich Bar for CCOS Attendees courtesy CATJ MAGAZINE
Drinks courtesy CCOS '82 Exhibitors

2:30 - 5:00 p.m. OPEN FORUM - REFRANCHISING Cherokee
Stephen R. Effros, Moderator
Executive Director, CATA
Susan McAdams
National League of Cities
Jack Frazee
Centel Communications
Art Hill
Cardiff Publishing Co.
Selman Kramer
Southern Satellite Systems

2:30 - 5:00 p.m. BIG BUCKS IN A SMALL TOWN Natchez Trace
Richard Kirn
Wire Teleview Corporation

7:00 - 9:00 p.m. EXHIBITS OPEN Ryman Hall
Drinks Courtesy CCOS '82 Exhibitors

TUESDAY, JULY 6TH

Management Sessions

9:00 - 10:00 a.m. ADVERTISING ON CABLE PAYS Cherokee
Saralee Hymen
Cabletelevision Advertising Bureau

10:00 - 11:30 a.m. AD SPOTS ON SATELLITE PROGRAMMING Cherokee
Jane Greenburg
Turner Broadcasting
Shirley Rohn
ESPN

Technical Sessions

9:00 - 11:30 a.m. WHAT WILL TWO OR THREE DEGREE SATELLITE SPACING DO TO YOUR TVRO RECEPTION? Natchez Trace
Paul Fox
HBO
Jim Grabenstine
Microdyne Corporation
Gene Augustin
Antenna Technology Corporation

9:00 - 11:30 a.m. LET'S ANALYZE THE SITUATION Judges' Parlor
Raleigh B. Stelle
Texscan Corporation

12 Noon - 2:00 p.m. EXHIBITS OPEN Ryman Hall
Sandwich Bar for CCOS Attendees courtesy CATJ MAGAZINE
Drinks courtesy CCOS '82 Exhibitors

2:30 - 5:00 p.m. DUNGEONS AND DRAGONS — THE COPYRIGHT Cherokee
MONSTER BREATHES FIRE AGAIN
Stephen R. Effros
Executive Director, CATA

2:30 - 3:45 p.m. EQUIPMENT AND INTERFACE Natchez Trace
Bruce Uerling
Gardiner Communications
Bob Kuopus
Gardiner Communications

4:00 - 5:00 p.m. FIND OUT WHAT'S NEW ON THE BIRDS Natchez Trace
Jim Britain
Group W Satellite Communications
Don Andersson
Cable Health Network

2:30 - 5:00 p.m. KEEP THAT SYSTEM EQUIPMENT OPERATING PROPERLY Polk
Fred Rogers
Quality RF Services

5:00 - 7:00 p.m. EXHIBITS OPEN Ryman Hall
Drinks courtesy CCOS '82 Exhibitors

7:00 - 8:00 p.m. Cocktail Party Nashville Lobby

8:00 - 9:00 p.m. Banquet Chattanooga

9:00 p.m. BILL ANDERSON, Host of the nationally syndicated TV show, BACKSTAGE AT THE GRAND OLE OPRY Chattanooga
Presented by GROUP W SATELLITE COMMUNICATIONS which brings you THE NASHVILLE NETWORK, SATELLITE NEWS CHANNELS, and THE DISNEY CHANNEL

LADIES PROGRAM

Chairman: Mildred Fox

MONDAY, JULY 5TH

7:45 a.m. WAKING CREW Stagedoor Lounge
Courtesy CATA

9:30 a.m. COUNTRY MUSIC HALL OF FAME TOUR
Tour and Lunch on your own

TUESDAY, JULY 6TH

9:30 a.m. HERMITAGE TOUR for the Ladies
WAVE COUNTRY Trip for the CCOS Young People

Tours, Lunch, and Transportation courtesy HOME BOX OFFICE □

SPEAKING LOGICALLY

Before anyone can learn Digital Electronics, one must become familiar with the language. Following is a glossary of terms commonly used in digital electronics.

A GLOSSARY of TERMS

ACCESS TIME: The average time it takes for a bit or word to be read at random in a memory unit. In a serial-access unit it is half the time to go from one end of the stored data to the other.

ADDEND: A number added to another.

ADDER: A building block that can provide a sum and a carry, if required, when adding two numbers electronically.

ADDRESS: A binary number designating a particular location in a memory unit where information may be stored.

ALOGRITHM: A set of procedures whereby a given result is obtained.

ALU: Arithmetic and Logic Unit. A subsystem that can perform any of a number of arithmetic and logical operations on words sent to it, such as addition, subtraction, comparison.

AMPLITUDE: The level of electrical or electronic signals or pulses in a circuit.

ANALOG: Electrical analog information is the variable property of electricity, such as voltage, current, amplitude of waves or pulses, or the frequency of waves or pulses.

ANALOG CIRCUITRY: Any electrical or electronic circuit that varies certain properties of electricity continuously and smoothly over it's given range instead of sudden switching between levels. Also called "Linear" circuitry.

AND GATE: A device or circuit with two or more inputs of binary digital electronic signals and one output. The AND GATE produces a HIGH output when all of the inputs are HIGH, and produces a LOW output when any one or more of the inputs is LOW.

ASTABLE MULTIVIBRATOR: A pulse producing circuit with no stable states. The Q output will flip back and forth between the HIGH and LOW states producing a squarewave pulse train output signal.

ASYNCHRONOUS: Any circuitry or operation without common clock signals.

AUGEND: A number to which another number is added.

BCD: Binary-Coded-Decimal Code. A binary numbering system which symbolizes each digit of a decimal number in groups of four bits.

BINARY NUMBER SYSTEM: A method of writing numbers by using the numerical digits 0 and 1.

BIPOLAR TRANSISTOR: An n-p-n or p-n-p transistor where a small flow of current through the "base" controls a proportionally larger current flow through the emitter and collector.

BISTABLE MULTIVIBRATOR: A pulse producing circuit with two stable states. The output may remain in Q = High or Q = Low indefinitely.

BIT: The smallest possible piece of information, usually thought of in terms of HIGH or LOW, a binary digit.

BRANCH: In computer programming, that part of the program where either of two possible instructions may be selected for the next operation.

COMPUTER: An electronic brain capable of storing inserted information and releasing any and/or all portions of that information upon command. A computer is distinguished from the minicomputer or microcomputer by physical size, speed, longer word capability, larger memory, faster operation, more ALU operations, and its' greater sophistication and flexibility. A digital computer consists of at least one main frame and various peripheral input, output, and memory units.

CONTROLLER: Those portions of a programmed system that select stored instructions, interpret those instructions, and transmit control signals to the other parts of the system.

CORE: A small ring of magnetic material that stores a bit as a permanent magnetic field.

CORE MEMORY: Contains billions of cores for bit storage.

COUNTER: A type of register made up of flip-flop circuits having one input and normally a parallel output from each flip-flop that counts pulses arriving at the input and stores the total count in a code.

CPU: Central Processing Unit. That section of a computer consisting of a controller, registers, and an ALU.

CRT TERMINAL: Cathode-Ray-Tube Terminal. A computer terminal that has a keyboard and a visual display screen similar to a television monitor.

D FLIP-FLOP: A clocked flip-flop with one data input (called D) whose precise output changes at the direction of a clock signal to the state maintained at the "D" input during the clock signal time span.

DATA: Another name for information.

DATA SELECTOR: A combinational building block routing data from one of several inputs to a single output in accordance with directions from the control signals. Also called a "multiplexer".

DECADE COUNTER: A decimal counter that operates in the base-10 number system, counting from 0 to 9 in BCD Code.

DECIMAL NUMBERING SYSTEM OR CODE: A method of writing numbers by using the ten numerical digits 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. Also called the "Arabic" number system.

DECODER: A building block that converts coded information on its' input to another code on its' output.

DEDICATED: A dedicated computer system is one limited to one particular job.

DEMULTIPLEXER: A combinational building block routing data from one input to one of several outputs according to the control signals.

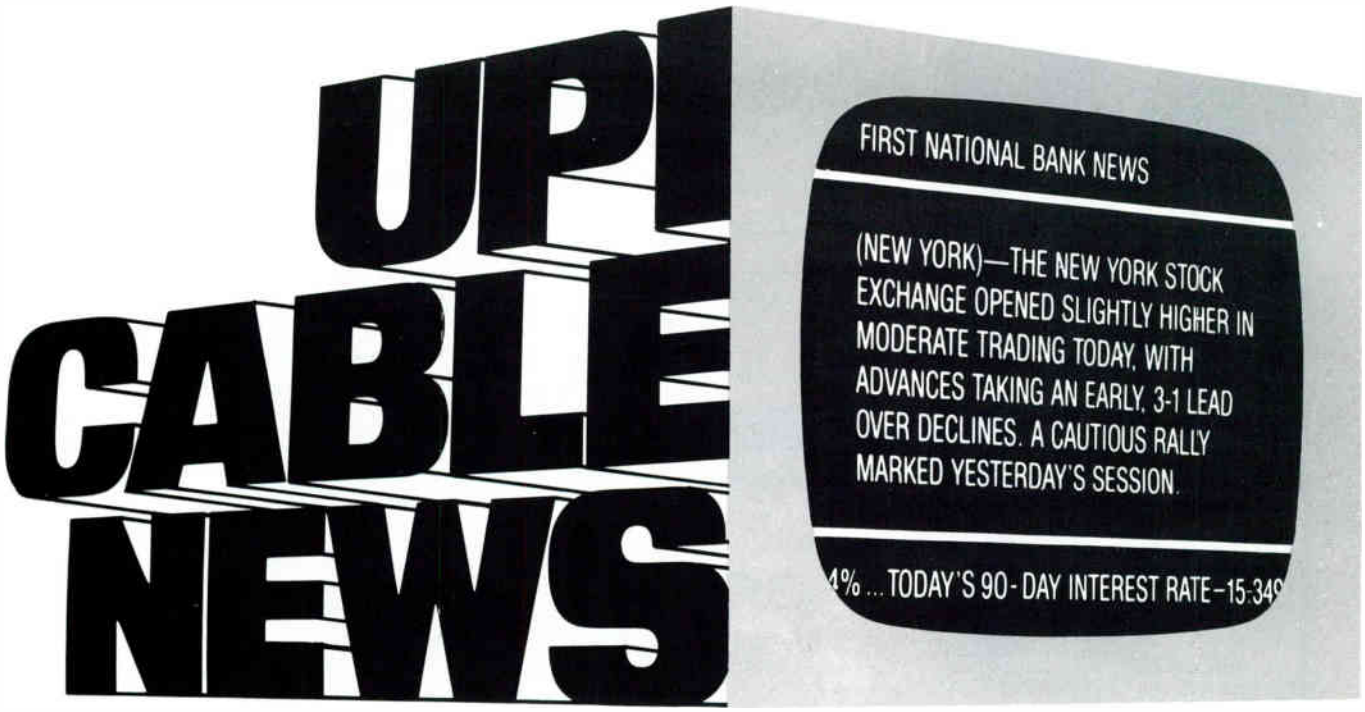
DIGIT: One of the symbols or numerals used in a number system.

DIGITAL: Symbolic of data in the form of bits or digits.

DIGITAL CIRCUITS: Electronic circuits similar in concept to relays and switches. Many digital circuits are high frequency electronic versions of simple switches that produce two states, "on" and "off".

DIGITAL COUNTER: A device or circuit that acts as a frequency divider. The two basic classes of digital counter circuits are serial and parallel. Serial counter

continued on page 44



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continued from page 42

circuits are called Ripple Counters. Parallel counter circuits are called Synchronous Counters.

DIODE: An electronic device with two electrodes, usually a rectifying p-n junction device that passes current in only one direction.

DIVIDEND: A number being divided by another number.

DIVISOR: A number being divided into another number.

DTL DEVICES: Diode-Transistor-Logic I.C. device. An improvement in operational speed over RTL devices. Now considered obsolete.

DRIVER: A circuit that provides digital signals with enough power to operate something more than a few nearby gates, such as LED displays, magnetic cores in a memory, etc.

DYNAMIC STORAGE UNIT: An electric circuit that stores one bit in the form of an electrical charge in a capacitor or capacitance type circuit.

ECL: Emitter-Coupled Logic. General design principle for a bipolar logic gate capable of very fast operation and operating in a non-saturated mode. A typical "prescaler" for a digital frequency counter is an ECL frequency divider circuit.

EDGE TRIGGERING: Where output changes can only occur during the transition period of a clock pulse. A positive edge-triggered flip-flop changes only one the LOW to HIGH transmission, while a negative edge-triggered flip-flop sees the negative going, HIGH to LOW transmission.

ENCODER: A building block that converts to a specific code rather than from a specific code.

EPITAXIAL: A thin layer of semiconductor crystal deposited on a substrate by crystal growth from a hot gas on a semiconductor slice or chip.

EPROM: Eraseable and Programmable Read-Only Memory. An I.C. memory chip whose stored data can be read at random. The data stored can be erased and new data stored, but only by a special system other than the system in which the memory is used.

EXCLUSIVE OR GATE: A device or circuit with two inputs and one output of binary digital information. The output is 1 when the inputs are 1 and 0. When the inputs are both 1 or 0, the output is 0.

FAN-OUT: The number of inputs to other gates that the output of a specific gate is connected to. It is desireable to have a high fan-out capability-gate that can drive a lot of other gates.

FLAG: A bit stored in a particular place which the system uses as a "reminder" of some operation that has been done or needs to be done.

FLIP-FLOP: A building block having two stable states that stores one bit by means of two gates, remember an input condition, and hold the same output after the data has passed.

FUNCTION TABLE: Shows the output electrical state that results from each combination of electrical states at the inputs of binary digital circuits. In binary electronic circuits the states are either HIGH or LOW, ON or OFF, OPEN or CLOSED.

GATE: A circuit that passes or refused to pass a signal in accordance with certain well defined rules. The basic

continued on page 54

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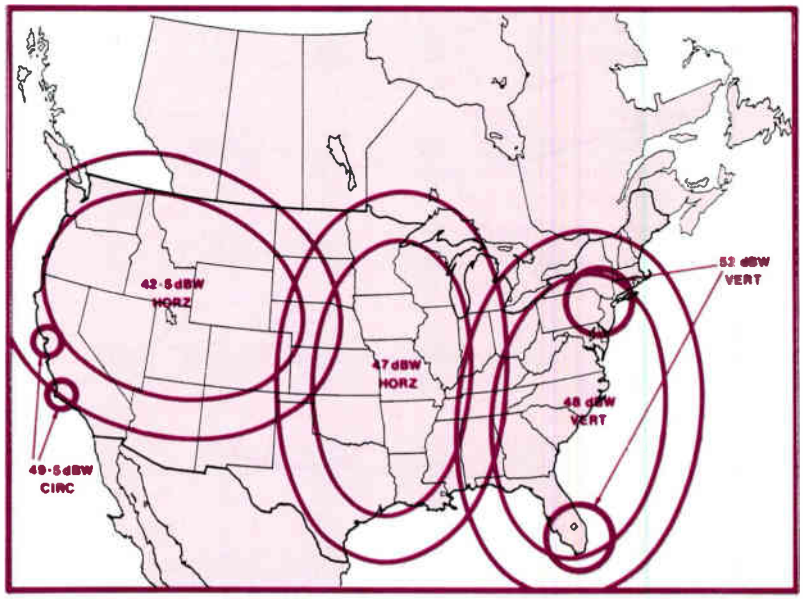

Figure 2:
Advanced Westar Typical K-Band Footprints

tion of at least 30 dB. The 2-meter dish is also shared by the TDRS payload, providing the K-Band space-to-ground link is that mode.

The remaining K-Band downlinks, the east and west zones, issue from the body-mounted 1.1-meter paraboloid. Again the same channel frequencies are used, with orthogonal linear polarizations. This antenna is not used in the TDRS mode.

Figure 2 shows the predicted footprint patterns for these K-Band beams, and **Figure 3** the associated transponder frequencies. Transponder bandwidth is 225 MHz, the same as Intelsat III, but here the wide band is designed to support digital SS-TDMA (satellite-switched time-division multiple access) communications, using QPSK (quaternary phase-shift keyed) modulation at a rate of 250 Mb/s (megabets per second) per transponder. The four K-Band transponders thus give a total data rate of 1000 Mb/s. The heart of the TDMA system is the onboard 4 x 4 way satellite switch. This can route data bursts between any pair of uplink and downlink beams within a frame period of 750 microseconds. The four main switch outputs (east, west and central zones, and east spots) drive four 30W TWT amplifiers, with two spares available. The west coast spot beams are fed from two 1.5 W TWTAs, multiplexed at IF with the western zone output. Again two spares are provided.

Hard limiting is employed at intermediate frequency in each K-Band transmission channel, making the 225 MHz bandwidth unsuitable for FDMA operation. Though designed to operate with the all-digital AW SS-TDMA network, and of course capable of carrying digital video signals, there seems to be no reason why the full power of a 225 MHz transponder could not be

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GENERAL COOKBOOK NOTE

Cookbook designs are selected for their general purpose applicability and for quick construction, using easy-to-get parts. Explicit theory is avoided and is implicit in the simple formulas for circuit elements. We will present each design in "stand alone" form: no need to go to any other technical references! Part #2 of the series follows...

Power Passing PART 2

General Purpose

CABLE TECH'S FILTER

APPLICATION

You want to pass the lower portion of the VHF spectrum (5-300 MHz) and suppress the **upper** portion. Perhaps you want a temporary trunk filter to suppress the superband while you get pole traps in place.

This simple, nine-branch filter will gnerally give less than 1 db loss in the passband (below F_c). It passes power and snaps off sharply to give 40 db at a frequency only 10% above F_c.

This design can be put together with readily available ceramic disk capacitors and hand-wound inductors.

DESIGN PROCEDURE

(1) Select your cut-off frequency F_c. This is the **highest** frequency you want to pass with low loss.

(2) Go to **Figure 1** and compute the circuit elements (in Pfd, for capacitors and u-henry, for inductances.)

(3) Select capacitors from **standard values. (See Figure 1).** If calculated values are non-standard (within 5% of standard values), parallel two or more standard values which add up to the correct value.

(4) Wind your coil inductors. See the formula on **Figure 1** and compute the number of turns required. Round up to nearest half-turn, to make circuit layout easier: you can always stretch the coil to reduce inductance to the correct value.

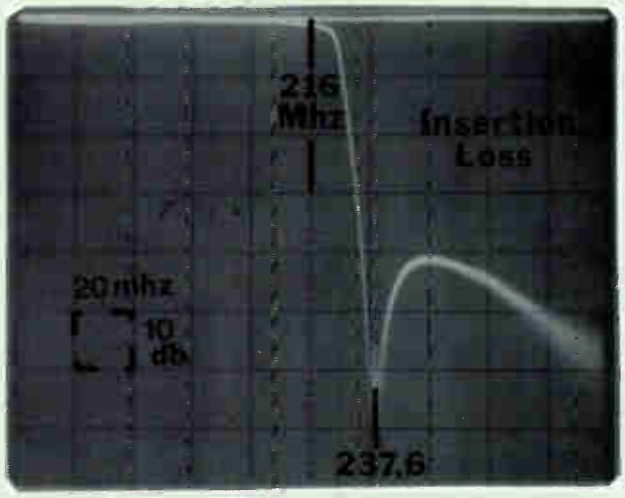
(5) Circuit layout. Position coils for low mutual coupling: adjacent coil axes should be at right angles to one another. Layout for **minimum** lead length on CM (doesn't matter of CE).

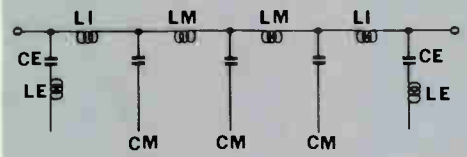
Figure 1

DESIGN of 75 ohm LOW-PASS FILTER

CIRCUIT ELEMENTS

CE: (522)/(Fc-Mhz)Pfd
CM: (3203)/(Fc-Mhz)Pfd
LE: (40)/(Fc-Mhz)μh
LI: (19.3)/(Fc-Mhz)μh
LM: (29.2)/(Fc-Mhz)μh





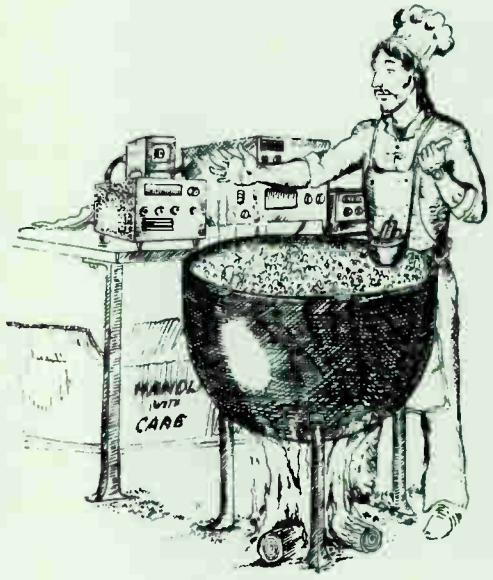
SCHEMATIC – Low-Pass Filter 75 ohms

STANDARD CAPACITANCE VALUES

Primary standard values are:

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

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



Low Pass Filter COOKBOOK

A SERIES OF DESIGNS . . .

BY: Glyn Bostick
Richard Martin
Daniel Bostick
Microwave Filter Co., Inc.

TUNING UP

(1) Sweeping insertion loss (on an analyzer, for instance), "tweek" LE (both ends) for maximum notch at 1.1 x F_c.

(2) Optimize return loss. Sweeping for return loss, "tweek" LM for highest return loss in the passband. "Tweek" LI to get sharp roll-off near F_c.

DESIGN EXAMPLE

(1) We want to suppress as much of the super-band (216-300 MHz) as possible while passing channels 2-13 (54-216 MHz). **So, our F_c is 216 MHz.**

(2)/ (4) We go to **Figure 1** and compute the required circuit element values:

CE = 2.42 Pfd (used 2.2 Pfd)

CM = 14.83 Pfd (used 15 Pfd)

LE = 0.185 uh (Computed 5¼ T, used 5 T)

LI = 0.089 uh (Computed 3.4 T, used 4 T)

LM = 0.135 uh (Computed 4.3 T, used 4 T)

(5) We now lay out the elements per **Figure 2.** Note that coil axes are at nearly right angles between adjacent coils — to minimize mutual coupling.

Figure 1 is a spectrum sweep of the completed filter.

Figure 1
DESIGN of 75 ohm LOW-PASS FILTER

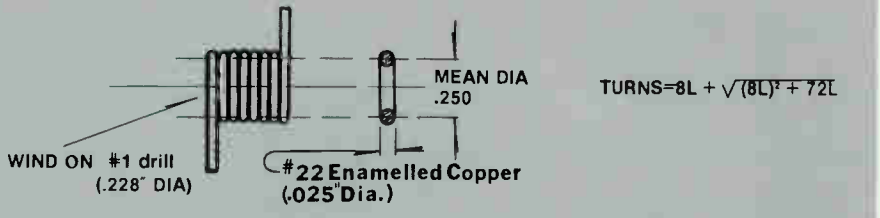
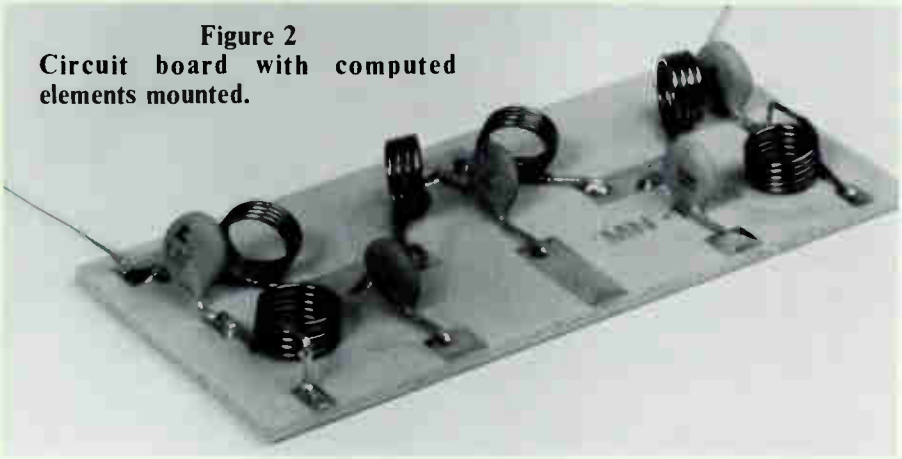


Figure 2
Circuit board with computed elements mounted.



NEXT TIME

We'll present a "quick-design" for CATV **High-pass** filters, useful for separating the VHF band into two segments (wanted and unwanted) of our choosing.

ACKNOWLEDGEMENTS

Many thanks to John Greatrex for simple, powerful line art and to Bonnie Whipple for typing/proofing. □

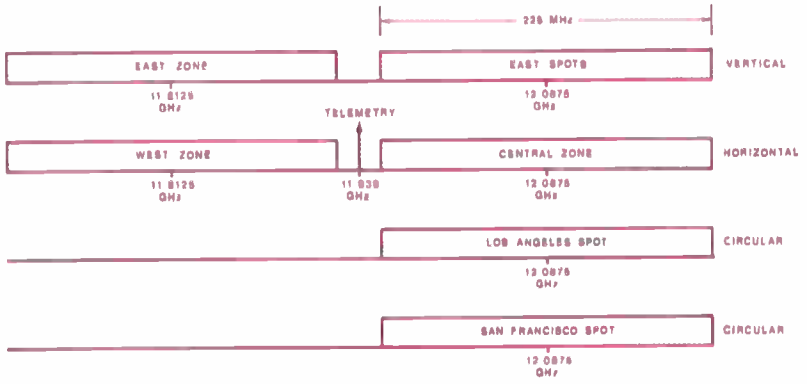


Figure 3: Advanced Westar K-Band Downlink Transponder Frequencies.

made available to a 36 MHz or 18 MHz FM TV signal within that bandwidth. The TDRS/AW 'spare' bird at 79°W is essentially uncommitted, apart from occasional contingency use by NASA, and represents a valuable resource. Western Union feels that industry will be slow to take up the high-speed data capabilities of the AW network, and that the 'spare' satellite will provide the ideal vehicle for an interim DBS-type TV service, with EIRPs high enough to serve home antennas in the 1 to 1.5m range, for 60% of American homes. Additionally, no other satellite system has sufficient bandwidth to accommodate experimental transmission of the proposed high-definition and wide-screen TV standards which may one day allow the home TV screen to do full justice to the movie-maker's product.

The C-Band payload: In comparison to what we have described, the 6/4 GHz package looks very ordinary. No new technology is involved here, in fact from a user's point of view AW will probably be indistinguishable from the earliest Westars, the Hughes HS-333 birds of Westars I, II and III. The same twelve 5-watt transponders are provided, with horizontal polarization and no frequency re-use. The offset-fed semi-elliptical reflector of 1.2 x 1.6-meter aperture seems to have changed its form between design and construction of the satellite, but provides CONUS coverage of 33 dBW minimum, plus apparently some service to Puerto Rico, and low power beams available to Alaska and Hawaii (28 dBW and 26 dBW respectively). This C-Band payload will allow continuation of service when Westars I, II and III reach the end of their useful lives. By then the 24 transponder Westars IV, V and VI will be handling most of the Westar traffic.

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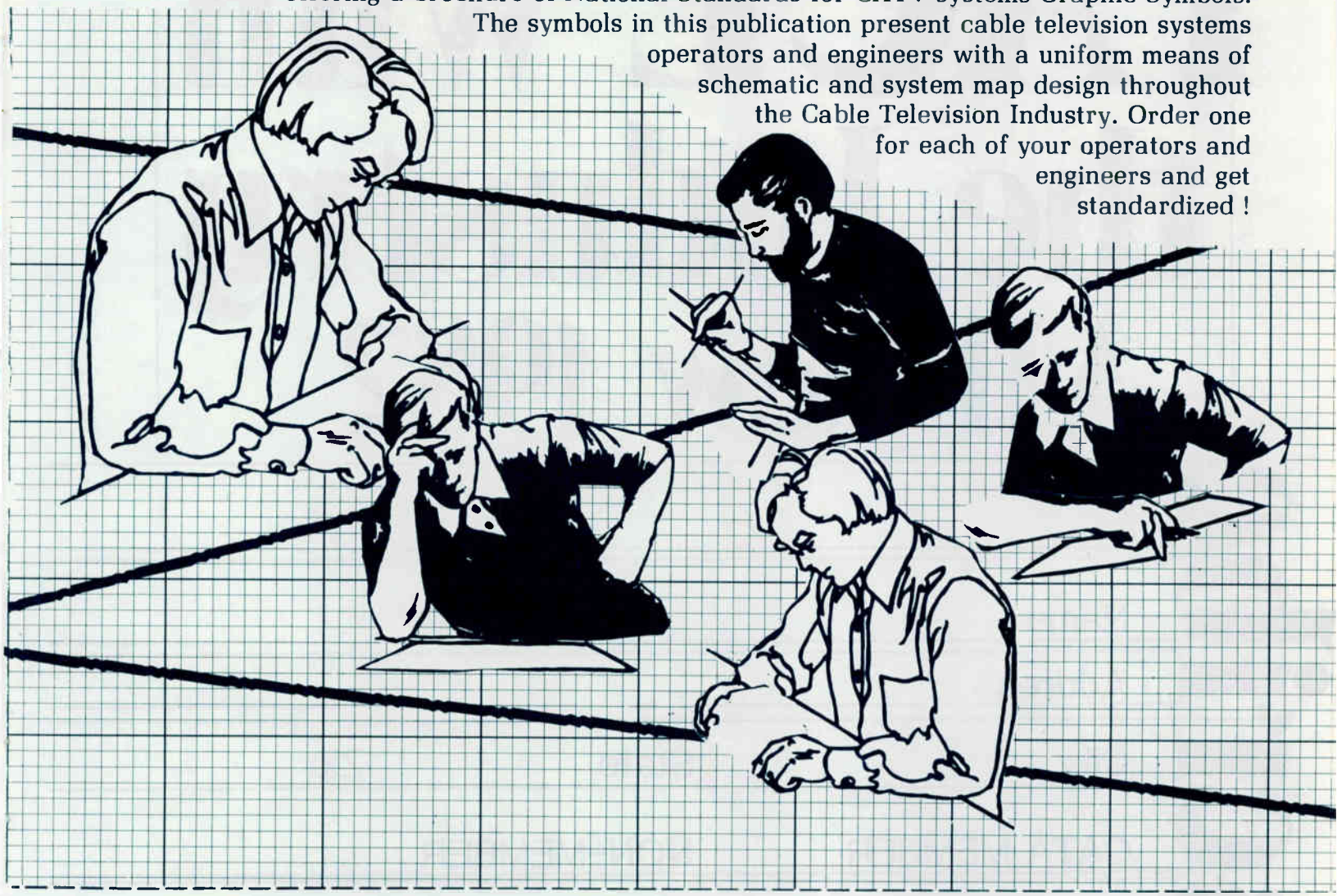

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forms of digital electronic gates are AND, OR, NOT, NAND, NOR, or XOR (Exclusive-OR) gates. The gate in an MOS transistor is the metal plate for holding the charge to control the transistor.

HARDWARE: The actual physical parts and structures that compose a system, subsystem, etc.

HARD-WIRED: A system, subsystem, or building block that does not contain stored instructions to control its' operation. It depends upon the way it is put together and upon the inputs it receives for operation.

HTL: High Threshold Logic, sometimes called HNIL (high noise immunity logic). A bipolar transistor device requiring a high input voltage to trigger a transition eliminating the problem of noise pulses activating the device or circuit. CMOS operated at high voltage values are usually used in noisy environments rather than HTL devices today.

IC: Integrated Circuit: A small package with electronic terminals, containing a chip of silicon. The surface of the silicon chip is processed to form hundreds or thousands of transistors and other devices to make up an electronic circuit.

I^2L: Integrated Injection Logic. A specific type of logic gate that uses essentially only one bipolar transistor.

INPUT: An information signal coming into a system or part of a system.

INSTRUCTION: A string of bits in a specific combination that are stored in a programmed digital system. Each instruction contains information in a special code that tells the system what operation to perform next.

INSTRUCTION CYCLE: That period of time in which a programmed system obeys a particular instruction.

INVERTER: A binary digital building block with one input and one output in which the output state is the opposite of the input state.

J-K FLIP-FLOP: A clocked flip-flop with two inputs, J and K, acting as a clocked R-S flip-flop, except that when clocked while both J and K are 1, it switches to the opposite state rather than an unknown state. Probably the most common and useful form of the clocked flip-flop.

JAM DATA ENTRY: A form of parallel data entry whereby the circuit allows a loading of data bits from parallel inputs without having to clear the register before entry is made.

LATCH: A circuit with an input and output for digital information, and a third input for a control signal is a one-bit latch. The control signal will make the output either follow the input signal or hold to its' present state. Several latches used together with the same control signal to each would be a type of register called a multi-bit latch.

LED: Light-Emitting Diode. A type of semiconductor light bulb made from a piece of semiconductor material such as gallium phosphide that appears as a light when current is passed through it in a specific direction.

LEVEL TRIGGERING: Output state changes only occur during the active clock pulse time, changing to HIGH (positive level trigger) or LOW (negative level trigger).

LOAD TRANSFER: When synchronization occurs between two flip-flop so that the second flip-flop is kept inactive when the input stage (first flip-flop) is being set up, then making the first flip-flop inactive while transferring the data to the second flip-flop. This part of the sequence is called a load-transfer operation.

LOGIC DIAGRAM: A wiring or schematic diagram using electronic symbols for gates, flip-flops, building blocks, etc., and showing interconnections between these parts.

LOGIC FAMILY: A series of I.C. devices that use the same general design style for all gates, processed in the same manner during manufacture, whose input and output signals are all compatible with one another so that they may be interconnected without regard to interfacing.

LSB or LSD: Least-Significant Bit or Digit. The bit or digit at the right end of a number with the smallest numerical value.

LSI: A level of complexity of integrated circuits, essentially a complete major subsystem having 100 or more gates or equivalent circuits fabricated into an IC.

MAGNETIC BUBBLE: A small moveable magnetized area formed under specific conditions in a thin film of magnetic garnet crystal fabricated similar to an IC. Magnetic bubbles provide very dense serial-access storage of bits.

MAGNETIC DISK, DRUM, or TAPE: Types of serial-access mass memory that stores bits as small magnetized spots in moving magnetic material, used for peripheral storage in computer systems.

MAIN FRAME: That section of a computer consisting of a central processing unit (CPU) and a random-access mass memory.

MASS MEMORY: A memory that can permanently hold and store relatively large amounts of information until the memory is replaced by the system.

MASTER-SLAVE: The procedure by which two flip-flops or dynamic storage units are connected so that the circuit allows only one output state change per clock pulse. The master unit receives and stores an incoming bit before the slave unit releases a bit that was previously received by the master unit.

MEMORY: That part of a digital system where information is stored.

MICROCOMPUTER: A computer of the lowest range in size and speed, and generally with less sophistication and flexibility than other types of computers.

MICROPROCESSOR: An integrated circuit or set of a few IC's that can be programmed with stored instructions to provide numerous functions and made up of at least one controller, several registers, and an arithmetic and logic unit (ALU).

MICROPROGRAM: Programmed systems having two levels of programming where instructions in the main or upper level cause executions of operation at the lower, or microprogrammed, level. These operational routines consist of microinstructions stored at microaddresses in a ROM, PROM, or EPROM memory unit.

MINICOMPUTER: A computer whose range in size, speed, sophistication and flexibility falls between that of the micro computer and full computer.

MODULUS: The number of states that a counter counts through before it returns to the beginning state.

continued on page 56

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MONOSTABLE MULTIVIBRATOR: A multivibrator with only one stable state. Frequently called a one-shot circuit.

MOS INTEGRATED CIRCUIT: A digital integrated circuit whose transistors are all MOS transistors.

MOS TRANSISTOR: Metal Oxide Semiconductor. A type of transistor that operates from an electric field produced by a voltage on a metal plate called the gate. The electric field reacts through a layer of oxide insulation on a semiconductor channel, controlling the depth which controls the current flow through the semiconductor channel.

MSB or MSD: Most Significant Bit or Digit. The bit or digit at the left end of a number having the largest numerical value.

MULTIPLEXER: A data selector.

MULTIVIBRATOR: A pulse producing circuit. The three basic forms of multivibrators are monostable, bistable, and astable.

N-TYPE SEMICONDUCTOR: A semiconductor manufactured from semiconductor material such as silicon, that contains a small proportion of other elements, like phosphorous, causing any current flow through the material to react primarily by the movement of negative charges.

NAND GATE: A binary digital building block that is a NOT-AND gate: an AND gate followed by an inverter.

NEGATIVE LOGIC: In the design of electronic binary digital circuits, when the more negative of the two voltage levels represents the HIGH (1) and the less negative voltage levels represent the LOW (0).

NOISE MARGIN: The difference between the voltage transmitted for each logic state and the voltage required at an input to be accepted correctly as one of the logic states. The noise margin of a gate or other digital building block defines the amount of noise level that would be required to override the proper voltage waves or pulses to cause the digital circuits to transmit and receive information erroneously.

NOR GATE: A binary digital building block that is a NOT-OR gate; an OR gate followed by an inverter.

NOT GATE: An inverter that produces an output opposite of the input signal.

ONE SHOT: A monostable multivibrator that produces one output pulse for each pulse received at the trigger input.

OR GATE: A device or circuit with two or more inputs of binary digital information and one output. The output is HIGH when any input is HIGH and LOW when all of the inputs are LOW.

OUTPUT: An information signal going out from a system or part of a system.

P-TYPE SEMICONDUCTOR: A semiconductor manufactured from semiconductor material, like silicon, containing a small proportion of other elements, like boron causing any current flow through the material to react primarily by the movement of positive charges.

PARALLEL DATA ENTRY: In parallel data entry the register must first be cleared by bringing the reset line to low momentarily, and loading the data applied to the register from the parallel inputs by momentarily bringing

the set line to HIGH. Parallel data entry is a costlier operation than serial data entry, but it is also a much faster operation.

PARALLEL DATA TRANSMISSION: Two or more bits of a group are transmitted in parallel when they are all transmitted from the same source, to the same destination, at the same time.

PARALLEL REGISTER: Two or more flip-flops with a common clock signal that are used to store bits transmitted in parallel.

PERIPHERAL: Those units or equipment outside the main frame, such as disk and tape units, keyboards, etc.

PHASE: Time intervals for each clock cycle in a system may be divided into two or more segments called phases which are defined by pulses in a seperate network for each phase. Phases provide the means for making several operations occur in the proper order during one clock cycle.

PIPO: Parallel-In-Parallel Out. A manner in which data is put in or put out of a register.

PISO: Parallel In-Serial Out. Another method of data input and output for a register.

PLA: Programmable Logic Array. An MOS read-only memory used as a network of logic gates.

POSITIVE LOGIC: In the design of electronic binary digital circuits where the more positive of the two voltage levels represents the HIGH and the more negative voltage represents the LOW.

PRESENT COUNTER: A preset counter is a counter that increments from a specific predetermined point rather than from 0000.

PROGRAM: Any group of instructions that are planned so that one instruction leads to another in computer operation.

PROGRAM COUNTER: The parts that provide a method for adding 1 to the address of the current instruction. A program counter may consist of the address register and an adder.

PROGRAMMED SYSTEM: A system that operates by following a series of stored instructions.

PROM: Programmable Read-Only Memory. An IC memory chip whose data is permanently stored by the user, cannot be changed or reprogrammed, and can be read at random.

PROPOGATION DELAY: The time a gate takes after an input is quickly changed from one state to another to make a resulting change in the output state. Propogation delay is expressed in nanoseconds or microseconds.

RAM: Random-Access Memory. A memory with numerous storage locations where words may be stored or recovered in any order at random.

REFRESH: To restore the charge of a dynamic storage unit to its' desired voltage level.

REGISTER: Two or more flip-flops organized to store multiple bits of data.

RESET: When a stored bit is brought to 0.

RS FLIP-FLOP: Reset-Set Flip-Flop. Sometimes referred to as an SR (Set-Reset) Flip-Flop. An RS Flip-Flop can be made from two NAND gates or two NOR gates which have two inputs, R (Reset) and S (Set). A momentary HIGH at the R input changes the output to LOW, while a momentary HIGH at the S input changes the

output to LOW.

RETRIGGERABLE: A one-shot multivibrator that will respond to additional input commands while the multivibrator is in an unstable state is said to be retriggerable.

RIPPLE COUNTER: A counter whose elements are wired in series so that an input signal must ripple through the complete chain before it has any effect upon the output. This results in a slower operation than that of synchronous counters.

ROM: Read-Only Memory. A memory unit containing data permanently stored when the unit was manufactured, usually an IC chip with each bit stored as a permanent electrical connection, which can be read at random.

ROUTINE: A series of instructions followed by a programmed system to do a particular job. It is usually contained within a main program, may occur over and over, and planned so that each instruction leads to another instruction or the same instruction followed over and over. Also called Programmed Routine.

R-S LATCH: An R-S Flip-Flop composed of two NOR gates cross-connected so that the output of each forms an input to the other.

RTL: Resistor-Transistor-Logic. One of the first logic families in digital electronics, now obsolete.

S-R LATCH: An S-R flip-flop composed of two NAND gates cross-connected with the output of each forming the input to the other.

SCHOTTKY DIODE: A type of rectifying diode made by a metal terminal contacting a lightly doped region in a semiconductor crystal. Very useful in improving the performance of TTL Circuits.

SEMICONDUCTOR: A transistor, diode, or other similar device made from semiconductor material such as silicon, germanium, and gallium phosphide in a nearly pure crystal form.

SEQUENTIAL BUILDING BLOCK: One or more flip-flops or dynamic storage units, usually with one or more logic gates and several inputs and outputs. The combination of bits at the outputs does not have to depend on the present combination at the inputs, but on the past history of a sequence of input combinations over a period of time.

SERIAL ACCESS MEMORY: A memory where the stored data is accessable for reading or writing only in a definite, fixed order rather than at random.

SERIAL DATA TRANSMISSION: When two or more bits of a group are said to be transmitted in series when one at a time is transmitted through the same wire.

SET: A stored bit is set by making it a 1.

SHIFT: A movement of stored data to right or left.

SHIFT REGISTER: Two or more flip-flops with a common clock signal that are connected in series so that stored bits shift one stage during each clock cycle.

SIPO: Serial-In-Parallel-Out. A method of data input and output for a register.

SISO: Serial-In-Serial-Out. A fourth method of data input and output for a register.

SOFTWARE: The stored instructions that control a

programmed system, typically on magnetic tapes or discs.

SPEED-POWER PRODUCT: The propogation delay in nanoseconds multiplied by the power dissipation in milliwatts in transistor switching units. The product is expressed in picojoules.

STATE: The logic "state" of a conductor in a digital circuit means its' condition of being either HIGH or LOW.

STATIC MEMORY: An IC memory whose storage elements are flip-flops rather than dynamic storage units.

STORED PROGRAM: A set of instructions in memory determining the order of the problem solution.

SUBSTRATE: The underlayer of semiconductor material of a slice or chip that lies beneath the diffused and epitaxially deposited areas.

SUBROUTINE: A routine that is part of another routine.

SUBSYSTEM: A smaller system that is part of a larger system.

SUBTRACTION COUNTER: Decreases, rather than increases, the count for each excursion of the input pulse. Also called a Down Counter.

SWITCHING CIRCUIT: An electrical or electronic circuit whose outputs are in two definite states rather than varying over a wide range.

SYNCHRONOUS: When two or more operations are made to happen in a system at the same time by means of a clock signal.

SYNCHRONOUS COUNTER: Feeds the clock input to all flip-flops in parallel resulting in a much faster operation than a Ripple Counter.

SYSTEM: A group of devices, circuits, or subsystems that work together to perform a specific operation.

T FLIP-FLOP: Toggle Flip-Flop. A flip-flop circuit with an input designated "T" whose outputs switch to the opposite states on receiving a signal at the input.

TERMINAL: An input or output device operated by a person. The input is usually a keyboard, and the output is usually a typewriter, printer, or CRT.

TRANSDUCER: A device that converts information from one medium to another.

TRUTH TABLE: A table that shows the logic state that results on the output of a binary building block from each combination of logic states at the information input.

TTL: Transistor-Transistor-Logic. A type of circuit design for a logic gate using two bipolar transistors.

UP-DOWN CONVERTER: A counter that can operate both up (incremental) and down (decremental) depending upon the logic level applied to a mode input.

VARIABLE: A quantity that can assume any of a given set of values.

VOLATILE MEMORY: A memory unit that loses its' stored data when the electrical power is turned off.

WORD: A group or string of bits handled as a unit that is usually stored at a certain address in a random-access memory.

WRITE: To record data in a storage or data medium.□

SHOWCASE

SHOWTIME ANNOUNCES LICENSING AGREEMENT WITH TWENTIETH CENTURY-FOX

SHOWTIME and Twentieth Century-Fox have signed a major licensing agreement for the pay television exhibition of a number of hit feature films, it was announced today by Jim Miller, Vice President, Program Planning and Feature Films, Showtime Entertainment and Ed Michalove, Vice President, Sales, Twentieth Century-Fox Telecommunications.

Films covered by this agreement include Mel Brooks' "History of the World, Part I," an outrageous recreation of prehistoric times, the Roman Empire, Spanish Inquisition and French Revolution. This hysterical glimpse at the past stars Brooks, Madeline Kahn, Harvey Korman and Dom DeLuise. Also from Fox comes "Taps," featuring Oscar winners George C. Scott and Timothy Hutton, in a riveting drama that explores the possible dangers of a military education, and "Modern Problems," starring Chevy Chase as a bumbling air traffic controller with uncontrollable telekinetic powers. Other films covered by this agreement include "Tatoo," with Maud Adams and Bruce Dern, and "Zorro, the Gay Blade," starring George Hamilton.

SHOWTIME, a joint venture of Viacom International Inc. and Teleprompter Corporation, has approximately 2.8 million subscribers in over 1,300 cable systems throughout the United States. This total entertainment service is offered 24 hours a day, seven days a week.

TOCOM ESTABLISHES NEW REPAIR CENTER

TOCOM has recently reorganized a Repair Center in Brownsville, Texas, and are now in a better position to serve you in the event a repair is necessary.

In order for TOCOM to handle all repairs as expeditiously as possible, they would appreciate your cooperation regarding the following:

1. Prior to returning any units for repair, please obtain a Returned Material Authorization (RMA) number from the Repair Center in Brownsville. All inquiries about the status of repairs should be directed to the Repair Center and referenced by the RMA number.
2. Please limit shipment size to a minimum of ten units and a maximum of 50 units whenever possible.
3. Please display the RMA number on each carton of your shipments and include a packing slip listing the serial numbers of the units being returned in each carton. The packing slip should also advise them of your preferred carrier for return of the repaired units.

For your records, the address and telephone number are:

TOCOM, INC.
1900 Billy Mitchell Blvd.
Building "C"
Brownsville, TX 78520
Telephone (512) 546-8291

TOCOM INTRODUCES ADDRESSABLE CONVERTER WITH INTERACTIVE VIDEOTEX CAPABILITIES

TOCOM, Inc. has introduced continuous live demonstration of interactive information retrieval (videotex) using a two-way addressable converter.

TOCOM's 5510A Home Information Terminal, the two-way interactive addressable converter of the 55 PLUS system, will access information from two major data retrieval services now available to cable television system operators. The 5510A Home Information Terminal will accept information requests from either an alphanumeric keyboard or from TOCOM's wireless remote control unit. The 55 PLUS System will then transmit the request to the remote data retrieval service and will translate returned data messages to text and graphics for display on the television screen. The 5510A Home Information Terminal effectively allows a subscriber's television screen to replace the traditional CRT for data display. The two-way converter's built-in return transmitter allows it to communicate with the 55 PLUS system headend for a wide range of two-way applications. Other uses for the two-way capability include interactive pay-per-view, opinion polling/subscriber response, and channel monitoring. The 5510A is also designed to support transaction processing applications like home banking and home shopping.

The **TOCOM 55 PLUS Home Information Terminal** is completely compatible with the entire 55 PLUS family, using the same baseband scrambling, addressing and headend technology. It can be used in the same cable system as the 5504A one-way addressable converter, allowing the cable operator to provide maximum levels of home entertainment and home information services to subscribers.

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

Microwave Filter's Tunable TVRO Bandpass Filter

Microwave Filter Co. Inc. is featuring a tunable TVRO bandpass filter. This bandpass filter 3923-T tunes to any of the 24 TVRO transponders my means of three calibrated dials.

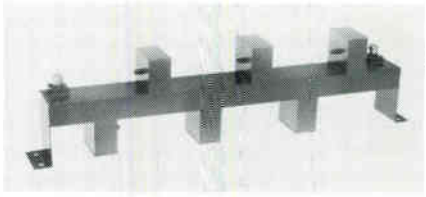
When tuned to a particular transponder, 3 dB bandwidth is 40 MHz with less than 1.5 dB loss. Selectivity is 30 dB at ± 76 MHz. The filter features type N connectors and passes DC power.

The filter is delivered with a specification sheet with tuning instructions.

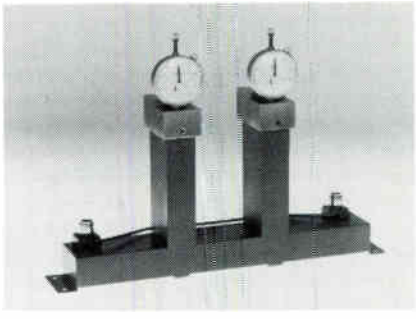
Price and delivery is $225.00 and 10 days, respectively. For more information, contact Emily Bostick, Microwave Filter Co., Inc., 6743 Kinne Street, East Syracuse, NY 13057. US TOLL FREE 1-800-448-1666 (collect 315-437-3953 in NYS/CAN/HI/AK).

MICROWAVE FILTER INTRODUCES EARTH STATION INTERFERENCE TRAP AND TERRESTRIAL FREQUENCY ANALYZER

Model 3966 is a microwave trap for preventing strong microwave carriers from reaching earth station downconverters. The trap can block out up to 6 microwave telephone carriers (offset 10 MHz from transponder frequencies). Connectors are type N and the trap passes DC power to the LNA.



The trap is custom made to customers specific microwave offenders. Price is $180.00 for a single carrier trap plus



$90.00 per additional interfering carrier. Delivery is 10 days.

The Model 4043 "Terrestrial Tracer" is

a tunable, calibrated wavemeter for diagnostic evaluation of TVRO system terrestrial interference in the 3.7-4.2 GHz band. The tunable notches (approximately 20 db deep) can be adjusted to obtain best system performance while viewing a transponder which displays symptoms of interference. When best performance is obtained, the calibrated indicators can be used to determine the terrestrial carrier frequency. Then, a permanent microwave notch filter can be fabricated to remove the offender from the spectrum. Repeating this process for other transponders will identify other terrestrial carriers which can be removed.

The 4043 is installed in the signal path between the LNA and the downconverter. The unit passes DC for supplying power to the LNA.

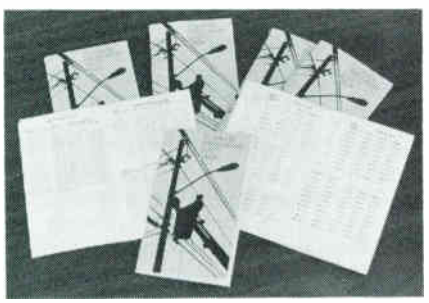
An application handbook and a calibration chart for reading the frequency setting is supplied with the 4043.

Price and delivery are $790.00 and two weeks respectively.

For more information, contact Emily Bostick, Microwave Filter Co., Inc., 6743 Kinne Street, East Syracuse, NY 13057. US TOLL-FREE 1-800-448-1666 (collect 315-437-3953 in NYS/CAN/HI/AK).

GTE PRODUCT'S CATV REFERENCE HANDBOOK FREE TO SYSTEM OPERATORS

GTE Products Corporation, Sylvania-CATV Division, recently published a CATV Reference Data Booklet which is available free to cable system operators. This mini-handbook contains frequency charts, system design parameters, con-



version tables, cable attenuations values, powering criteria and other information useful to system engineers and technicians. The size of the booklet is convenient to carry in a shirt pocket for technicians working in the field.

To obtain a free booklet, write to GTE Products Corporaion, Sylvania-CATV Division, 10841 Pellicano Drive, El Paso, Texas 79935, Attn: Marketing Communications Department, or call (800) 351-2345 in the Continental U.S. or from Texas, Hawaii and Alaska phone (915) 594-3555.

CNN GOES TO JAPAN

Cable News Network has reached agreement with Asahi National Broadcasting Co., Ltd. (TV Asahi) and Japan Cable Television Co., Ltd. (JCTV) of Japan for the exchange of news materials between the two Japanese companies and CNN. Under the agreement, JCTV will carry CNN a minimum of 17 hours a day upon receipt of transponder lease approval to TV Asahi and/or JCTV by KDD.

JCTV is the only English language telecast facility now serving Japan. It currently serves virtually every major hotel in Tokyo, and is spreading to commercial establishments and residences throughout the country. JCTV is a subsidiary of TV Asahi.

"This is a tremendous breakthrough for Cable News Network, Turner Broadcasting, the cable industry and global telecommunications," declared TBS Board Chairman R.E. "Ted" Turner. "The impact of CNN is being felt around the world, and it has become a respected and valued news source in an astoundingly short period of time. We have prided ourselves on being the pioneers and the leaders of the telecommunications industry, and we are now doing the same in the news industry."

"With MOSCOW LIFE, TAKE TWO from Havana, our agreement to be carried in Australia, and now this, we truly are making CNN a global network," Turner continued. "Not only are we providing Americans with instantaneous coverage of breaking events from around the world, but we are offering this coverage to the people of nations halfway around the globe. I couldn't be more proud."

"This truly is an historic agreement," said TV Asahi President Eizo Nakagawa. "This will be the first transponder lease service to Japan, and, for the first time, we will be able to see the news as it happens in the United States. CNN will also provide us with its live coverage of events in other parts of the world. And, when CNN is not being telecast, we will provide our viewers with live news from Japan. This is a very exciting concept, and I am very happy to be a part of it."

It is expected that JCTV will be granted its transponder lease before the end of the year.

WAVETEK ANNOUNCES NEW SIGNAL LEVEL METER PRODUCTS

Wavetek Indiana, Inc., announces the addition of 450 MHz versions of the popular SAM I and SAM Jr., Signal Level Meters.

The SAM I 450 covers the full 4-450 MHz frequency band, with accuracy of better than ± 0.5 dB. Standard features include a built-in AC-DC voltmeter, switch-selectable Hum measurement, and a built-in calibrator. Available options include a built-in Spectrum Analyzer, and UHF coverage.

The SAM Jr. 450 covers the frequency range of 50-450 MHz, with ± 0.75 dB accuracy. Standard features include front panel calibration adjustment, built-in audio speaker, and a weather-sealed Lexan front panel.

Also announced is the addition of a new generation of the SAM III. This unit features microprocessor-controlled tuning,a llowing instantaneous access of any of 60 preprogrammed standard channels, and 60 HRC channels. Tuning is accomplished through direct keyboard entry of the desired channel, and the selection of audio or video carrier.

In addition to the preprogrammed channels, any frequency across the 4-450 MHz band may be selected, in 0.1 MHz increments through the keyboard. UHF coverage (470-890 MHz) is available as an option.

Standard features include Spectrum Analyzer outputs, AD-DC voltmeter, Built-In Calibrator, and fully weather-sealed case. Measurement accuracy is better than ± 0.5 dB.

The Model SAM III D Signal Level Meter has also been added to its line of CATV test equipment. Remotely controlled measurements are now a reality with this new generation of equipment.

Using an RS-232 compatible interface, this unit can be accessed through a telephone line or a two-way cable, and then directed to perform the required measurements. Depending on the computer, and the programming used, this information can be stored, or compared to correct levels.

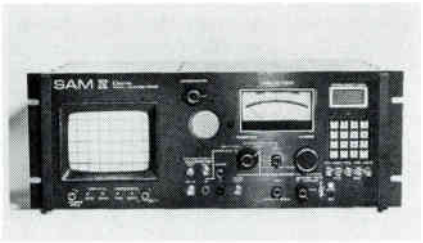
This unit is a unique type of signal level meter. Using microprocessor techniques, it is preprogrammed for a total of 120 channels, 60 in the standard configuration, and 60 in the HRC system. These channels may be selected, either video or audio, by direct keyboard entry on the SAM III D.

In addition to the preprogrammed channels, any frequency across the 4-450 MHz band may be accessed through the keyboard, in 0.1 MHz steps.

The SAM III D includes such standard features as spectrum analyzer outputs, built-in calibration, AC-DC Voltmeter, and Hum measurement capability.

The SAM IV Rack Mounted Signal Level Meter is preprogrammed for amplitude measurements with 60 standard channels, and 60 HRC channels, allowing direct keyboard entry of channels in any sequence. Audio carriers of all channels are also preprogrammed, and may be selected with the flip of a switch.

In addition to the preprogrammed channels, any frequency across the 4-450 MHz of coverage may be accessed through the keyboard, in 0.1 MHz steps.



The SAM IV is built into a standard 19" rack mount, taking up only 7" of panel space. A 5" dedicated display scope, tied directly into the Spectrum Analyzer function of the SAM IV, allows Spectrum Analysis measurements with no additional equipment. The display scope features separate on/off function, brightness control, and screwdriver adjustments for vertical and horizontal gain and position.

Remote control of the SAM IV is available through an RS-232 compatible interface built into the unit. This allows remote measurements to be made, whent he unit is interfaced through the appropriate RF or telephone modem.

There has also been added a new line of Tunable Preselctors, covering the full 55-440 MHz CATV band. These are primarily designed for use with spectrum analyzers and signal level meters to read very small signals, in the presence of much higher signals.

The Models PP55-110, PP110-220, and PP220-440 are precision preselectors, tunable across 55-110 MHz, 110-220 MHz, and 220-440 MHz respectively, with a constant bandpass of 6 MHz. All of the units are designed with 75 ohm input and outputs, and ruggedized field cases.

The Model PP-75 combines all three units into one weather sealed, field-portable case, with a total frequency coverage of 55-440 MHz.

The introduction of the Model SP549 Remote Controller designed for use with the Model 1402A Converter Sweep has been made. The SP549 ties directly into the Model 1402A tuning circuitry, and allows remote foot-pedal operation or push-button tuning of the 1402A.

The addition of this option allows the technician to very rapidly tune across the converter under alignment, reducing repair and alignment time to a minimum on each unit under test.

The unit may be ordered as an addition to existing Model 1402As, or in conjunction with a new 1402A.

For more information, contact the Sales Department at Wavetek Indiana, Inc. P.O. Box 190, Beech Grove, Indiana 46107 or call (317) 788-9351.

SCIENTIFIC-ATLANTA PUBLISHES 1982/1983 CABLE COMMUNICATIONS PRODUCTS CATALOG AND SERIES 8500 SET-TOP TERMINAL BROCHURE

Scientific-Atlanta, Inc., has published its 1982/1983 Cable Communications Product Catalog. The 213-page catalog describes Scientific-Atlanta's complete line of cable communications products including distribution and data products, coaxial cable, headend equipment, set-top terminals, satellite receiving equipment, off-air antennas and product support services.

New products featured in the catalog include the Series 8500, 440 MHz set-top terminal, Models 6402 and 6410 broadband data modems, the Series 2400 cable security system and KU-band receive-only earth station. Expanded product support services are also featured, helping make Scientific-Atlanta's product line the most comprehensive in the cable communications industry today.

Scientific-Atlanta, Inc., has also published a brochure on the new series 8500 set-top terminal. The theme of the brochure is "the computer that thinks it's a set-top terminal." Features and operation of the 8500 are outlined fully, and a page of performance specifications is included.

The 440 MHz, heterodyne converter comes as an addressable or non-addressable unit. Both addressable and non-addressable units have advanced soft-security which prevents the unit from being tuned to receive any audio or video signal on an unauthorized channel. The same security feature operates in the case of parental control of adult programming.

To receive a copy of the catalog or brochure, write to Scientific-Atlanta, Inc., Box 105027, Dept. A/R, Atlanta, Georiga 30348.

SCIENTIFIC-ATLANTA INTRODUCES SECURITY PRODUCT LINE FOR CATV APPLICATIONS

Scientific-Atlanta has combined many years of field experience in the cable television and home security industries to create a security products package which will help the cable operator make a smooth and confident move to interactive services. The new Series 2400 cable security monitoring system features a complete line of headend and computer monitoring equipment, with a comprehensive sotfware package that regular office personnel can operate easily.

The monitoring system is compatible with many different alarm systems. It can serve multiple headends, or headends with multiple hubs. The computer can handle from 2,000 to 64,000 subscribers. A digital dialer for system redundancy can be fully integrated with the computer so alarm reporting and

monitoring proceed as usual if the cable system should fail.

The scanner is located at the headend and uses dual return channels, occupying minimal bandwidth, for split-second alarm response.

Scientific-Atlanta will deliver Series 2400 systems in 120 days ARO. Product support services, applications engineering and technical literature are also available, and if more information on the **Series 2400** is desired contact Donald Meyer, Marketing Manager, Cable Security Products, Scientific Atlanta, at 404-441-4000.

MICRODYNE FEATURES 14-FOOT CONICAL HORN EARTH STATION

MICRODYNE has installed a unique satellite earth station being used at WTTG Channel Five in Washington, D.C. The photograph shows the Microdyne 14-foot conical horn antenna with a fully motorized base. Because of its unique location with high levels of microwave interference, a standard parabolic antenna would not provide adequate performance. The CH-14 conical horn antenna, however, was specifically designed for such environments and is providing WTTG with broadcast quality pictures.

Microdyne feels that application for this type product are increasing and anticipates increased sales of this type.

This particular site also used Microdyne's latest addition to their broadcast line, the MAPS-2, a system comprised of two microprocessor controlled subsystems including a rack-mounted data processor/control unit and a keyboard/display unit. MAPS-2 utilizes the unique E^2 PROM technology in which a satellite location is permanently stored.

Note:

1. Keyboard Display may be moved to antenna for set-up.
2. Modems available for unlimited distance remote control with Keyboard/Display. (Recommended for "MOV" instructions only.)
3. STL or telephone interface for contact closure control.

For more information, contact the MICRODYNE CORPORATION, P.O. Box 7213, Ocala, Florida 32672-0213 or call (904) 687-4633.

MAPS II SPECIFICATIONS

Antenna drive unit specifications

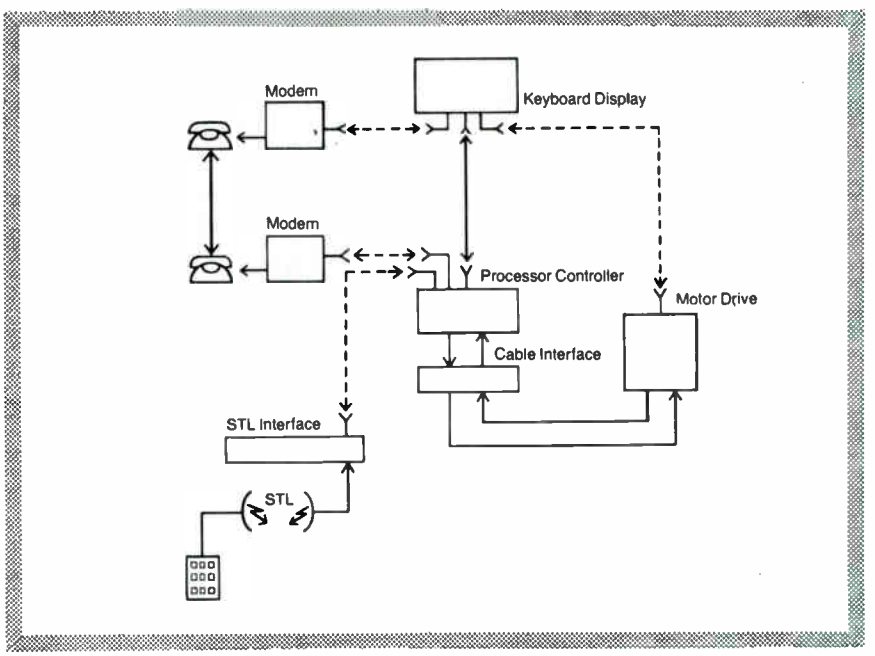
Pointing Accuracy	0.1° at 4GHz
Azimuth Coverage	110°
Elevation Coverage	40°
Polarization Coverage	250°
Azimuth Drive Speed	6.0°/minute
Elevation Drive Speed	2.6°/minute
Polarization Drive Speed	1°/second
Azimuth Screw Jack	20 ton
Elevation Screw Jack	10 ton
Azimuth Motor	1 HP
Polarization Motor	1/10 HP
Azimuth Load Bearing Surface	Lubricated Teflon, 4"w x 84" dia.
Power Requirements	208 VAC, 3 Phase, 30 amperes

Keyboard/display unit specifications

Microprocessor	MC6802
Memory	2K PROM
Communications Interface	Integral serial communications port interfaces with RS-232C, half-duplex dedicated
Display	LCD four-character alphanumeric
Keyboard	4"x5" Matrix, containing six special function keys, numeric keys 0-9, nine alpha keys and two spare keys.
Environmental:	
Operating Temp.	0°C to +50°C
	−40°C to +85°C
Storage	
Mechanical:	
Size	5¼" high x 19" wide and 10" deep
Weight	10 lbs., approximately
Prime Power	115V AC, 50 to 400 Hz standard
Indicators	Two front panel LED's

Processor/control unit specifications

Microprocessor	MC6802
Memory	E^2 PROM (2K) 6KL PROM
Random Access Memory, CMOS	Battery back-up
Communications Interface	RS-232C, half-duplex and multi-conductor Cable Belden 8459 (current loop)
Environmental:	
Operating Temp.	0°C to +50°C
Storage	−40°C to +85°C
Mechanical:	
Size	5¼ high x 19" wide x 15.5" deep
Weight	12 pounds, approximately
Prime Power	115V AC, 50 to 400 Hz standard
Indicator	Nine front panel LED's



Cable Health Network

CABLE HEALTH NETWORK[tm] has committed to more than 1100 half hours of original programming at launch, June 30th Jeffrey C. Reiss, President and Chief Executive Officer of the network said at a press conference in Las Vegas on May 3rd. "This is an unprecedented in our industry" Mr. Reiss said, "and demonstrates our confidence in the partnerships we are developing with our producers. We will be offering 25 original series," he said, "that's more shows and episodes than any other cable service or of any new season on the three broadcast networks." Cable Health Network will air 24 hours a day, 7 days a week on Satcom IIIR, Transponder 17.

Loreen Arbus, Vice President in Charge of Program Developing for Cable Health Network said, "In making this unusual commitment to such a large amount of original material, we are recognizing that any new series requires at least four or five episodes before the creative team begins to put together that special chemistry which is characteristic of every successful series. We also know that every new series needs time to build and fully realize its potential audience. We are taking the long range view in developing our programming — taking responsibility from scrip development to completion without basing judgment on a single show."

Ms. Arbus, continued, "We are dedicated to providing programming that will make a difference in people's lives. Viewers want to know how to help themselves to health, and Cable Health Network wants to arm them with the information they need to do just that, in the form of high quality, diverse, motivational programs," she said. "Additionally, every program has received a full series commitment, anywhere from six episodes to 130, which in itself exemplifies the confidence we have in the appeal of our programs and the skill of our producers."

"CABLE HEALTH NETWORK is based on research," she said. "Studies have shown that more than two out of every three Americans want to see more health related programming as opposed to more sports, news or situation comedies. Research has also indicated that during the past few years concerns about personal health and relationships with their families have grown immensely in the minds of Americans.

"Our programming" Ms. Arbus said, "will fit into ten basic umbrella categories and while we are presenting a broad spectrum of topics, our shows will appeal to specific target audiences such as parents, senior citizens, fitness fans, the diet conscious, children and science buffs. We have attracted a group of highly respected producers, with vast and varied experience in news, variety and dramatic programming, many of whom are award winners."

CABLE HEALTH NETWORK will launch with the following line-up, each individual show is noted under its umbrella category.

WHAT'S NEW IN HEALTH AND SCIENCE:

Cable Health World Report will keep global tabs on the latest breakthroughs in science, medicine and health. Each show will have a lead story, a hot line to live reports from around the nation, a segment on health syles, an investigative report and a commentary by Dr. Art Ulene.

KEEPING FIT:

The Sporting Life supports the principle that the family who plays together stays together with a family sports and recreation half hour weekly series. Charlie Coane, a California radio sports authority will help viewers learn to ski, skate, skydive, windsurf, sail and skindive in the right way with the proper equipment, apparel, safety tips and advice from sports celebrities. Mr. Coane will produce the series.

DIET, NUTRITION AND EATING WELL:

The Healthy Gourmet proves there is a delicious side of nutrition and that "health food" and "gourmet" can appear in the same sentence. This half-hour Tuesday-Thursday series will be produced by Richard Milton, a noted producer/director who also holds a Ph.D. in nutrition. Health conscious celebrity guests will share their favorite recipes with the host and hostess. A noted nutritionist acts as consultant.

The Ultimate Diet Show, one hour, three times a week will present guest stars who have battled the bulge along with a celebrity host, diet experts, diet news, diet tips, diet humor and The Ultimate Diet. The show will be produced by Paul Abeyta and Peter Kaikko, both of whom have impressive TV credits.

HEALTHY RELATIONSHIPS:

Family Counselor comes to the rescue of the family unit . . . perhaps the most embattled institution in America. The half hour strip will treat the psychological emergencies of family life using improvisational actors in an office setting to dramatize family conflicts like living with elderly parents, teen age pregnany, rape, long-term unemployment, extra-marital affairs. The therapist helping them will be an actual family counselor. A Capricorn Entertainment Production.

Human Sexuality realizes sex is a controversial subject and for many people, a problem. This half hour strip will provide answers and allow the sharing of intimate sexual feelings and experiences. Discussions will be led by Sharon Goldsmith, a registered nurse and sex therapist along with a male host. Guest experts and a studio audience will also take part. Rob Fiedler and Peter Berlin will produce the series in consultation with the Institute for the Advanced Study of Human Sexuality in San Francisco.

HUMAN INTEREST AND LIFESTYLES:

Reader's Digest Life Time brings America's most widely read magazine to television. Features will include true life stories, health quizzes, nutrition tips and home safety, do-it-yourself segments on repairs and laughter — "the best medicine". The series, a half hour strip is being produced by The Reader's Digest Association, Inc. and Telecom Entertainment Inc.

Regis Philbin's Celebrity Healthstyles is an hour a day, five days a week of stars — celebrity dieters, health buffs, exercise mavens, chefs, beauty and fashion experts. Viewers will find out all the rumors they've heard about Regis are true! He'll also interview authors of hot new best sellers as well as controversial figures in medicine and nutrition. Producer for the series is Philbin Productions.

Medical Marvels will capture the real-life drama providing a behind the scenes look at the men and women who are changing the course of medical history, saving millions from death, disease and needless suffering. The daily show unfolds the inspiration, frustrations, setbacks, opposition and self doubts that lead to the exultation of final discovery and triumph. Reeves Cable Productions assocate Jim Hanley produces.

Pet Peeves features Dr. Jay Gould, a veteranarian and his co-host, animal trainer Toni Helfer answering letters from pets in a half hour weekly series. Pet owners will get advice on training, feeding and caring for their pets. Arnold Shapiro Academy Award winning producer of "Scared Straight" will produce.

Real Life Stories follows the course of a different real family each week providing insight into how our lives are led in 1980's America. Host Tom Cottle, a psychologist and lecturer at Harvard Medical School, as well as, host of the syndicated "Tom Cottle Show", will talk with the studio audience after each episode. Award winning Kay Hoffman, of Reeves Cable Productions will produce the half hour strip.

SELF HELP AND MEDICAL CARE:

Breaking the Habit, a half hour daily series features a different bad habit each day. Hostess June Lockhart will solicit advice from experts, provide field reports on the latest advances in behavior modification, interview celebrities and others who've overcome bad habits and ask the studio audience for feed-back. The series is being produced by producer-director Don Davis.

Guide To The Weekend Athlete provides advice for the generation of people who work five days a week and then become weekend athletes with runner's knee, tennis elbow and muscle spasms. This half hour weekly series, hosted by Dr. Allen Selner, a sports medicine specialist, is produced by Rob Fielder of Fiedler/Berline Productions.

Coping will examine a single subject, in-depth for an entire week in a half-hour strip format. Dr. Lester Coleman, a nationally syndicated columnist will host the series with a different co-host each week. They'll join in debate and discussion with the studio audience on such topics as herpes, birth defects, aging,

depression, diabetes, senility and deafness. Ward Sylvester of Reeves Cable Productions is producing.

GROWING UP:

Mommy, Daddy and Me, will be devoted to the bewildered parents of infant, tots and toddlers . . . those first three years that are fraught with fears, catastrophes, uncertainties and sleepless nights. Susan Bay-Schuck and her husband John Schuck will host. This half-hour weekly show will feature in-studio discussions and demonstrations with pediatricians and other infant experts, celebrity parents and field pieces on a variety of topics. Mary Bell will produce for TMT Productions.

How To Be A Terrific Parent can help ease the job of raising kids. The half hour weekly series will feature a host and a prominent female pediatrician examining the problems of parenting children from pre-birth to age 21, working with real parents to find solutions. Arnold Shapiro is producer.

GETTING OLDER, FEELING YOUNGER:

Seniors Group realizes that people over 50 are becoming the largest demographic segment in America and addresses their unique problems and frustrations. This "silenced" majority will have a forum in a half hour weekly series with discussions led by noted family and child counselor and best selling author Mel Krantzler. He helps older people come to grips with inflation, retirement, failing health, loss of loved ones, boredom, menopause, impotence and grandparenting. Actor Arthur Hill is host. Ken Belsky will produce the series.

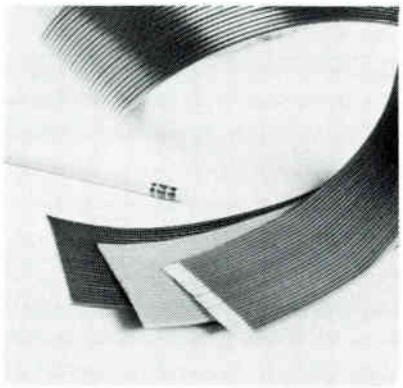
In conclusion, Ms. Arbus said there would soon be additional announcements on upcoming programming in the following categories: GROWING UP: THINKING AND FEELING; GETTING OLDER, FEELING YOUNGER; HEALTH AND MEDICAL CARE, and NATURE, SCIENCE AND TECHNOLOGY.

For more information, contact the **CABLE HEALTH NETWORK**, at 1211 Avenue of the Americas, N.Y., N.Y. 10036.

BELDEN INTRODUCES FLAT COAX CABLE

The **Belden Corporation** Electronic Division has introduced a line of flat coax cable in 50, 75, and 93 ohms (UL Style Number 2741).

All three flat coax cables have a temperature rating of −40°C to 105°C (UL rating 60°C maximum); a 30V voltage rating; and 4 to 25 conductors per cable. Spacings are conductor to conductor: .100"; drain wire to drain wire: .100"; and conductor to drain wire: .050". Crosstalk values for a 3, 5, or 7 nanosecond rise time are less than .1% for both far end and near end. Shielding is mylar reinforced aluminum with a solid tinned copper drain wire. Standard length is 100'.; nominal width is .400" to 2.500"; and nominal thickness is .105".



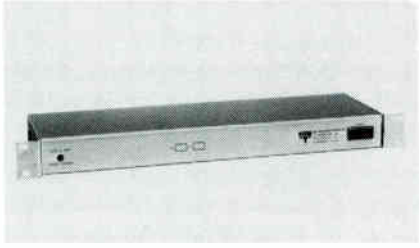
The 50, 75, and 93 ohm coax cables have respectively 28, 30, and 30 AWG solid copper conductors coated with an alkyd baked enamel. The three cables are color coded. The 50 ohm coax has a nominal .028" jacket wall of black PVC; the 75 ohm coax has a nominal .025" jacket wall of grey PVC; and the 93 ohm coax has a nominal .017" jacket wall of red PVC.

Applications: the 50 ohm coax may be used instead of RG-58/U type cables for short runs; the 75 ohm coax may be used in video operations for short runs; and the 93 ohm coax may replace RG-62/U type cables for short runs.

For additional information, write to Manager, Marketing Communications, Belden Corp., 2000 S. Batavia Ave., Geneva, IL 60134.

NEW CATV CRYSTAL CONTROLLED VHF CHANNEL CONVERTER ANNOUNCED BY BLONDER-TONGUE

Blonder-Tongue Laboratories, Inc., Old Bridge, NJ has announced the availability of a new VHF crystal controlled single channel converter designed for CATV headend installations. Designated DYNAVERTER No. 4457, the converter is electrically and mechanically compatible with B-T's DYNAMATIC Channel Processor, BPF-c Bandpass Filter, and AUDIOMATIC Aural/Visual Ratio Controller.



The **DYNAVERTER** is designed to convert any VHF channel to another VHF channel, Subband, IF, Midband or Superband channel. It can also be used to convert a subband or IF channel to VHF. A low noise figure, combined with high input capability, allows a large dynamic range window of trouble-free operation.

The **DYNAVERTER** converter features state-of-the-art circuitry for maximum versatility and minimum spurious outputs, allowing most conversions to be made without double conversion or external traps and filters. This simplifies headend design and reduces system costs.

A balanced mixer and highly stable crystal oscillator allow operation in an adjacent channel headend. The **DYNAVERTER** No. 4457 meets FCC radiation specs, Part 76, Subpart K.

Blonder-Tongue is a leader in the design and manufacture of a complete line of high quality products for reception enhancement of MATV, CATV, and home television systems as well as encoding and decoding equipment for Subscription Television (STV).

For more information, contact Blonder-Tongue at One Jake Brown Road, Old Bridge, N.J. 08857 or call (201) 679-4000.

SADELCO INTRODUCES THE INDUSTRIES FIRST HAND HELD SIGNAL LEVEL METER

Sadelco has announced the introduction of the **"Sensational Sadelette"**, the first hand held signal level meter.

The Sadelette accurately indicates signal levels in one dB steps. This unit is not an inaccurate composite signal measuring device, it is an easy to read 1dB resolution, 10 segment LED Bar Graph with a flashing over-range indicator. The total range of the Sadelette is −2 dBmV to +22 dBmV. The Sadelette features a Channel 2 and 3 select switch on the standard unit for use with most CATV converters. This low cost unit is equipped with a low battery warning light and operates on 2 - 9V batteries. The Sadelette may be ordered with an optional protective carrying case.

For additional information contact: Sadelco, Inc., 75 West Forest Avenue, Englewood, New Jersey 07631, (201) 569-3323. □

Associate Roster

ADT Security Systems, One World Trade Center, 92nd Fl., New York, NY 10048 (**M9 Security Equipment**) 212—558-1444
Alpha Technologies, 1305 Fraser St. D-G, Bellingham, WA 98225 (**M9, Standby Power Supplies**) 206—671-7703
AMCOM, Inc., Bldg. E, Suite 200, 5775 Peachtree-Dunwoody Rd., N.E., Atlanta, GA 30342 (**S9, Brokering & Consulting**) 404—256-0228
Amplica, Inc., 950 Lawrence Dr., Newbury Park, CA 91320 (**M4**) 805—498-9671
Anixter-Pruzan, Inc., 4711 Golf Road, Skokie, IL 60076 (**D1**) 312—677-2600
Apple 1 Store, Rte. #1, Box 156, Beaver Dam, WI 53916 414—885-6249
The Associated Press, 50 Rockfeller Plaza, New York, NY 10020 (**S9 Automated News SVC**) 212—262-4014
Automation Techniques, Inc., 1846 N. 106th E. Ave., Tulsa, OK 74116 (**M9**) 918—836-2584
Avantek, Inc., 481 Cottonwood Dr., Milpitas, CA 95035 (**M8, 9 TVRO Components**) 408—946-3080
B E I (Beston Electronics, Inc.), P.O. Box 937, Olathe, KS 66061 (**M9 Character Generators**) 913—764-1900
Belden Corp., Electronics Division, P.O. Box 1980, Richmond, IN 47374 (**M3**) 317—966-6661
Ben Hughes Communications Products Co., P.O. Box AS, Old Saybrook, CT 06475 (**M6, M9**) 203—388-3559
Blonder-Tongue Labs, Inc., 1 Jake Brown Rd., Old Bridge, NJ 08857 (M1, 2, 4, 5) 201—679-4000
Broadband Engineering, Inc., P.O. Box 1247, Jupiter, FL 33458 (**D9, replacement parts**) 1-800-327-6690
Broadcast Equipment Leasing, 7 Wood Street, Pittsburgh, PA 15222 (**S3**), 412—765-0690
Budco, Incorp., 4910 East Admiral Place, Tulsa, OK 74115, (**D9, Security & Identification Devices**), 800-331-2246
CATEL-Division of United Scientific Corp., 1400-D Stierling Rd., Mountain View, CA 94043, 415—969-9400
C-COR Electronics, Inc., 60 Decibel Rd., State College, PA 16801 (**M1, M4, M5, S1, S2, S8**) 814—238-2461
CBS Cable, 1211 Avenue of the Americas, 2nd Floor, New York, NY 10019 (**S4**) 212—975-1766
CCS Hatfield/CATV Div., 5707 W. Buckeye Rd., Phoenix, AZ 85063 (**M3**) 201—272-3850
CRC Electronics, Inc., 2669 Kilihau St., Honolulu, HI 96819 (**M9 Videotape & Headend Automation Eulpment**) 808—836-0811
CWY Electronics, 405 N. Earl Ave., Lafayette, IN 74904 (**M9, D1**) 317—447-4617
CableBus Systems Corporation, 7869 S.W. Nimbus Avenue, Beaverton, OR 97005, (**M1**) 503—543-3329
Cable Health Network, 2840 Mt. Wilkinson Pkwy., Atlanta, GA 30339 (**S4**) 404—436-0886
Cable-Text Instruments Corp., 705 Avenue K, Suite #4, Plano, TX 75074 (**M9 Generators**) 214—422-2554
Cable TV Supply Company, 5933 Bowcroft Street, Los Angeles, CA 90016 (**D1, D2, D3, D4, D5, D6, D7, D8, M5, M6**) 213—204-4440
Century III Electronics, Inc., 3880 E. Eagle Drive, Anaheim, CA 92807 (**M1, M3, M4, M5, M7, M8, S1, S2, S8**) 630-3714
Capscan, Inc., P.O. Box 36, Adelphia, NJ 07710, (**M1, M3, M4, M5**)
Channel Master, Div. of Avnet, Inc., Ellenville, NY 12428 (**M2, 3, 4, 5, 6, 7**) 914—647-5000
Collins Commercial Telecommunications, MP-402-101, Dallas, TX 75207 (**M9, Microwave**) 214—690-5954
Comm/Scope Company, Rt. 1, Box 199A, Catawba, NC 28609 (**M3**) 704—241-3142
Communications Equity Associates, 651 Lincoln Center, 5401 W. Kennedy Blvd., Tampa FL 33609 (**S3**) 813—877-8844
Communications Supply/Communications Construction, Inc., 319 J Westtown Rd., P.O. Box 1538, West Chester, PA 19380, (**D1, 3, 4, 5, 6, 7, 8, 9, S1, 2, 8, 9**) 800—345-8286
Computer Video Systems, Inc., 3678 W. 2105 S. Unit 2, Salt Lake City, UT 84120 (**M9**) 801—974-5380
ComSearch Inc., 11503 Sunrise Valley Drive, Reston, VA 22091 (**S8, S9, Earth station placement frequency coordination**) 703—620-6300
ComSonics, Inc., P.O. Box 1106, Harrisonburg, VA 22801 (**M8, M9, S8, S9**) 703—434-5965
DF Countryman Co., 1821 University Ave., St. Paul, MN 55104 (**D1, S1, S8**) 612—645-9153
Davco, Inc., P.O. Box 861, Batesville, AR 72501 (**D1, S1, S2, S8**) 501—793-3816
Ditch Witch, P.O. Box 66, Perry, OK 73077, (**M9**), 405—336-4402
The Drop Shop Ltd., Inc., Box 284, Roselle, NJ 07203 (**D3, 4, 5, 6, 7, 8, 9, M5, 6, 7, 8, 9 Plastics**) 800—526-4100
Durnell Engineering Inc., Hwy 4 So. Emmetsburg, IA 50536 (**M9**) 712—852-2611
Eagle Com-Tronics, Inc., 4562 Waterhouse Rd., Clay, NY 13041 (**M9 Pay TV Delivery Systems & Products**) 313—622-3402 and 800-448-7474
Eales Comm & Antenna Serv., 2904 N.W. 23rd, Oklahoma City, OK 73107 (**D1, 2, 3, 4, 5, 6, 7, S1, 2, S7, 8**) 405—946-3788
Eastern Microwave, Inc., 3 Northern Concourse, P.O. Box 4872, Syracuse, NY 13221 (**S4**) 315—455-5955
Electroline TV Equipment, Inc., 8750-8th Ave., St. Michel, Montreal, Canada H1Z 2W4 (**M4, 5, 7, 9, D7, 9**) 514—725-2471
Electron Consulting Associates, Box 2029, Grove, OK 74344, (**M2, D1, S1, 8**) 918—786-5349
Entertainment and Sports Programming Network, ESPN Plaza, Bristol, CT 06010 (**S9**) 203—584-8477
Ferguson Communications Corp., P.O. Drawer 1599, Henderson, TX 75652 (**S1, 2, 7, 8, 9**) 214—854-2405
Franey & Parr of Texas, Inc., (Formerly Doherty & Co.), One Turtle Creek Village, Suite 524, Dallas, TX (**S9, Insurance**) 214—528-4820
GTE Products Corp., Sylvania CATV Trans. Systems, 10841 Pellicano Dr., El Paso, TX 79935 (**D7, M4, M5, M6, S4, S8**) 800—351-2345
Gardiner Communications Corp., 1980 S. Post Oak Rd., Suite 2040, Houston, TX 77056 (**M9 TVRO Packages, S1, S2, S8**) 713—961-7348
General Cable Corp., 1 Woodbridge Center, P.O. Box 700 Woodbridge, NJ 07095 (**M3**) 201—636-5500
Gilbert Engineering Co., P.O. Box 23189, Phoenix, AZ 85063 (**M7**) 1-800-528-5567, TWX 910-951-1380
Group W Satellite Communications, 41 Harbor Plaza Dr., P.O. Box 10210, Stamford, CT 06904 (**S4**) 203—965-6219
H & R Communications, Rt. 3, Box 102G, Pocahontas, AK 72455 (**M2, D1, S2, S3, S8**) 501—647-2291
Harris Corporation-Satellite Communications Division, P.O. Box 1700, Melbourne, FL 32901 (**M2, M9, S2**) 305—724-3401
Heller-Oak Communications Finance Corp., 105 W. Adams St., Chicago, IL 60603 (**S3**) 312—621-7661
Hoarty & Raines Assoc., Inc., 8637 O'Neal Rd., Raleigh, NC 27612 (**S7, S9 Consultants**) 919—781-1734
Home Box Office, Inc. 7839 Churchill Way—Suite 133, Box 63, Dallas, TX 75251 (**S4**) 214—387-8557
Hughes Microwave Communications Products, 3060 W. Lomita Blvd., Torrance, CA 90505 (**M9**) 213—517-6233
Jerry Conn Associates, Inc., P.O. Box 444, Chambersburg, PA 17201 (**D3, D4, D5, D6, D7, D8**) 717—263-8258
KMP Computer Services, Inc., 703 Central Ave., Los Alamos, NM 87544, (**S4, 5**) 505—662-5545
Karnath Corporation, 2001 Westridge, Plano, TX 75075 (**S1, 2, 8, 9**) 214—422-7981 or 7055
Katek, Inc., 134 Wood Ave., Middlesex, NJ 08846 201—356-8940

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D6—CATV hardware	M6—CATV hardware	S6—CATV publishing
D7—CATV connectors	M7—CATV connectors	S7—CATV drop installation
D8—CATV test equipment	M8—CATV test equipment	S8—CATV engineering
D9—Other	M9—Other	S9—Other

Klungness Electronic Supply, P.O. Box 547, 107 Kent Street, Iron Mountain, MI 49801 (**D1, D8, S2, S8**) 906—774-1755
LRC Electronics, Inc., 901 South Ave., Horseheads, NY 14845 (**M7**) 607—739-3844
Larson Electronics, 311 S. Locust St., Denton, TX 76201 (**M9 Standby Power**) 817—387-0002
Lemco Tool Corporation, Box 330A, Cogan Station, PA 17728 (**M6, 9 Tools**) 717—494-0620
Lester Kamin & Company, 2020 North Loop West, Suite 111, Houston, TX 77018 (**S9 Brokers, Consultants**) 713—957-0310
Lindsay Specialty Products, Ltd., 50 Mary Street West, Lindsay, Ontario, Canada, K9V 4S7 (**M1, 2, 4, 5, 7, 9**) 705—324-2196
Magnavox CATV Division, 100 Fairgrounds Drive, Manlius, NY 13104 (**D4, 5, 7, M4, 5, 6, 7, S3, 8**) 315—682-9105
McCullough Satellite Equipment Route 5, Box 97, Salem, AR 72576 (**M2, 9, D3, 4, 6, 7**) 501—895-3167
Microdyne Corporation, 471 Oak Road, Ocala, FL 32672 (**M9 Satellite TV Receivers**) 904—687-4633
Microwave Associates Communications Co., 777 S. Central Expwy., Suite 1G, Richardson, TX 75080 (**M9 Microwave Radio Systems**) 214—234-3522
Microwave Filter Co., 6743 Kinne St., Box 103, E. Syracruse, NY 10357 (**M5 Bandpass Filters**) 315—437-4529
Midwest Corp., CATV, Divn., P.O. Box 226, Clarksburg, W. VA. 26301 (**D1, 2, 3, 4, 5, 6, 7, 8**) 304—624-5459
Miralite Corp., 1331 E. St. Gertrude P1, Santa Ana, CA 92705 (**M2**) 714—641-7000
Modern Cable Programs, 5000 Park St. N., St. Petersburg, FL 33709 (**S4**)
Mullen Communications Construction Co., Inc., P.O. Box 1387A, Green Bay, WI 54305 (**S2**) 414—468-4649
National Com-Service, Inc., 2255-E Wyandotte Rd., Willow Grove, PA 19090 (**D1, 2, S8, 9 repair service**) 215—657-4690
National Screen Service Corp., 1600 Broadway, New York, NY 10019 (**M9**) 212—246-5700
North Supply Company, 10951 Lakeview Ave., Lenexa, KS 66219 (**D1, 2, 3, 4, 5, 6, 7, 8**) 913—888-9800
Oak Industries Inc/CATV Div., Crystal Lake, IL 60014 (**M1, M9 Converters, S3**) 815—459-5000
Octagon Scientific, Inc., 476 E. Brighton Ave., Syracuse, NY 13210 (**M9**) 315—476-0660
Power and Telephone Supply Company, Inc., 530 Interchange Drive N.W., Atlanta, GA 30336 (**D1**) 404—691-6813
Prodelin, Inc., 1350 Duane Avenue, Santa Clara, CA 95050 (**M2, M3, M7, S2**) 408—244-4720
Pyramid Industries, Inc., P.O. Box 23169, Phoenix, AZ 85063 (**M7, 8**) 602—269-6431
Q-BIT Corporation, P.O. Box 2208, Melbourne, FL 32901 (**M4**) 305—727-1838
RMS CATV Division, 50 Antin Place, Bronx, NY 10462 (**M4, M5, M6, M7, M9**), 212-892-1000
Reuters, 1212 Avenue of the Americas, 16th Floor, New York, NY 10036 (**D9**) 212—730-2715
Rockwell International, Collins Transmission Systems Division, M.S. 402-101, Dallas, TX 75207 (**M9, Microwave/Satellite**) 214—996-5954
S.A.L. Communications, Inc., P.O. Box 794, Melville, NY 11747 (**D1**) 516—694-7110
Sadelco, Inc., 75 West Forest Ave., Englewood, NJ 07631 (**M8**) 201—569-3323
Scientific Atlanta Inc., 3845 Pleasantdale Rd., Atlanta, GA 30340 (**M1, M2, M4, M8, S1, S2, S3, S8**) 404—449-2000
Shafer Associates, Inc., 9501 Briar Glen Way, Gaithersburg, MD 20760 (**S9, consultant**) 301—869-4477
Showtime Entertainment Inc., 1633 Broadway, NY 10019 (**S4**) 212—708-1600
Southern Satellite Systems, Inc., P.O. Box 45684, Tulsa, OK 74145 (**S9**) 918—481-0881
Station Business Systems, 600 West Putnam, Greenwich, CT 06830 (**S4, 5, 9**) 203—622-2400
T.E.S.T., Inc., 16130 Stagg St., Van Nuys, CA 91409 (**M9 Encoders & Decoders**) 213—989-4535
TVC Supply Co., Inc., 1746 E. Chocolate Ave., Hershey, PA 17033 (**D1, 2, 3, 4, 5, 6, 7, 8**) 717—533-4982
TV Guide, Radnor, PA 19088 (**D9**) 215—293-8500
TeleCom Systems, Inc., P.O. Box 5214, Charlotte, NC (**S1, 2, 7, 8, 9**) 704—332-6064
Teledac, In., 1575 Tascherean Blvd., Longuevil, Quebec, Canada J4K 2X8 (**M9 Character Generators**) 514—651-3716
Tele-Wire Supply Corp., 122 Cutter Mill Rd., Great Neck, NY 11021 (**D1, 2, 3, 5, 6, 7, 8, 9**) 516—829-8484
Texscan Corp. 2446 N. Shadeland Ave., Indianapolis, IN 46219 (**M8 Bandpass Filters**) 317—357-8781
Theta-Com CATV, Division of Texscan Corporation, 2960 Grand Avenue, Phoenix, AZ 85061 (**M1, M4, M5, M7, M8**) 602—252-5021
Times Fiber Communications 358 Hall Avenue, Wallingford, CT 06492 (**M3**) 203—265-2361
Tocom, Inc., P.O. Box 47066, Dallas, TX 75247 (**M1, M4, M5, Converters**) 214—438-7691
Tomco Communications, Inc., 1145 Tasmin Dr., Sunnyvale, CA 94086 (**M4, M5, M9**)
Toner Cable Equipment, Inc., 969 Horsham Rd., Horsham, PA 19044 (**D2, D3, D4, D5, D6, D7**) 800—523-5947, In Penna. 800—492-2512
Triple Crown Electronics Inc., 4560 Fieldgate Dr., Mississauga, Ontario, Canada, L4W 3W6 (**M4, M8**) 416—629-1111, Telex 06-960-456
Turner Communications Corp. (WTBS-TV) 1050 Techwood Dr., Atlanta, GA 30318 404—898-8500
Tyton Corp., P.O. Box 23055, Milwaukee, WI 53223 (**M6, 7**) 414—355-1130
USA Network, 208 Harristown Rd., Glen Rock, NJ (**S4**) 201—445-8550
United Press International, 220 East 42nd St., New York, NY 10017 (**S9 Automated News Svc.**) 212—682-0400
United States Tower & Fab Co., P.O. Box 1438, Miami, OK 74354 (**M2, M9**) 918—540-1574
United Video, Inc., 3801 South Sheridan Rd., Tulsa, OK 74145 (**S9**) 918—749-8811
VU-TV, Inc., 4201 N. 16th St. #250, Phoenix, AZ 85016 (**S4**) 602—277-8888
Video Data Systems, 40 Oser Avenue, Hauppauge, NY 11787 (**M9**) 516—231-4400
Viewstar, Inc., 705 Progress Ave., Unite 53, Scarborough, Ontario, Canada M1H 2X1 (**M9 Cable Converter**) 416—439-3170
Vitek Electronics, Inc., 4 Gladys Court, Edison, NJ 08817 201—287-3200
Warner Amex Satellite Entertainment Corporation, 1211 Avenue of the Americas, New York, NY 10036, (**S4**) 212—944-4250
Wavetek Indiana, 5808 Churchman, Beech Grove, IN 46107 (**M8**) 800—428-4424 TWIX 810—341-3226
Weatherscan, Loop 132, Throckmorton Hwy., Olney, TX 76374 (**D9, Sony Equip. Dist., M9 Weather Channel Displays**) 817—564-5688
Western Communication Service, Box 347, San Angelo, TX 76901 (**M2, Towers**) 915—655-6262/653-3363
Winegard Company, 3000 Kirkwood Street, Burlington, IA 52601 (**M1, M2, M3, M4, M5, M7**) 319—753-0121

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50 Antin Place
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CABLE COMMUNICATIONS ENGINEER

The City of Columbus, Ohio wants an electrical engineer to design and develop a state of the art cable interconnect, including construction plans, equipment design and installation, data transmission design, and research of new communication needs, services and products.

Qualifications include a B.S.E.E. and three years of engineering experience in the cable industry, possession of a valid State of Ohio Certificate as a Registered Professional Engineer and possession of a valid motor vehicle operator's license.

Salary range is 32,739 to 35,734 and an excellent benefits package is provided. Resume must be **received** by July 9, 1982.

City of Columbus, Department of Energy and Telecommunication, 50 West Gay Street, Room 201, Columbus, Ohio 43215. For information, call: 614-222-7753.
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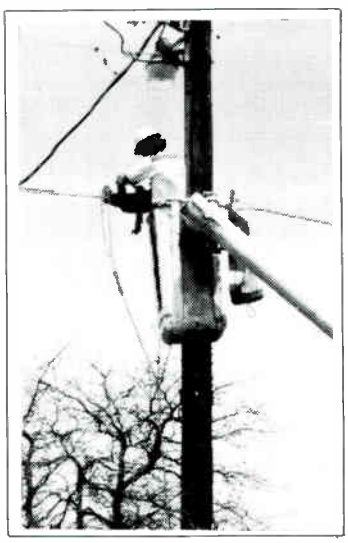

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