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CATJ

VOL. 9 NO. 6

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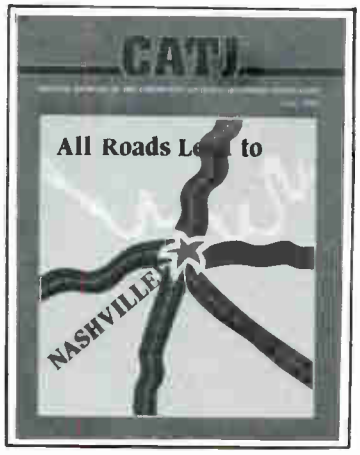
on the inside . . .

FEATURES

DEPARTMENTS



on the outside . . .

ABOUT THE COVER

Indeed, all roads do lead to Nashville!!! Come by car, plane, bus . . . but do plan to come! CCOS '82 is about to happen, and you won't want to miss it!

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catatorial

Ben V. Willie,
President of CATA

Call it what it is!

Municipal Ownership

of Cable Television Systems is Socialism

The Community Antenna Television Association has always had a reputation for unvarnished honesty. We ". . . tell it like we see it" as the saying goes. We are proud of that. It is sometimes not the easiest thing to do, especially when you are trying to gain the votes of Congressmen or Senators, or you are trying to get new members. But we have maintained that honest stance throughout, sometimes risking the consequences because we believe that someone has to stand up on occasion and let others know what is really going on — without the polite phrases, without the diplomatic smoke screens. CATA was recently put to the test again.

This time the issue **was,** and **is** municipal ownership of cable television. It is an idea that is gaining a lot of attention of late, particularly as the renewal process for franchising gets under way, and the cities are in desperate need of new sources of income. Those two coinciding events have focused the issue very clearly on cable television.

Certainly it is understandable. The cities need money. They have the impression that cable television is the "goose that laid the golden egg." From their point of view why not take over and get those supposed profits themselves?

Before getting to the philosophical problems with that theory, I think it is important that we correct some other misimpressions first. It is true that in some areas cable television has been financially very successful. It is also true, and very rarely mentioned, that cable television has been a severe financial failure in some areas too. The great success of cable in the last few years, and all the attendant publicity has come from the success of "pay cable". The introduction of satellite transmission of first run motion pictures received by the cable system on economical small satellite earth terminals resulted in some cases in almost doubling the "bottom line" of some companies. However there are two things that must be kept in mind about that. **First,** the new technology that is being demanded in new city builds, or in rebuilds, costs far more than that doubled bottom line yields. **Second,** other new technology has introduced competition for the **"pay"** dollar — STV, MDS, SMATV, DBS and so on are all now starting to compete for that profit margin. So at the same time cable's costs are going up, our profit margins are being threatened by competition. And that competition applies to all the other new services we can offer as well. The point is that cable, particularly in the larger urban areas, is by no means a "sure thing". It is a risk investment.

Having said all that we get back to the issue of governmental authorities taking over or building their own cable television systems. It is no secret that CATA strongly opposes municipal ownership. We do not believe the government should be in any way involved in the media. Municipal ownership threatens our First Amendment freedoms in a most fundamental way. Further, the government has no business getting involved in private enterprise. Such actions are not only putting public funds at risk, they are in direct contradiction of our free marketplace society. **And here is where we at CATA get blunt.** Municipal ownership of cable television systems is socialism. There is no more accurate word to describe it, and we will continue to label it for what it is despite the fact that a lot of folks feel that we are drawing the issue too starkly.

In recent testimony given by CATA before the Senate Com-

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Call it what it is!

MUNICIPAL OWNERSHIP OF CABLE TELEVISION SYSTEMS IS SOCIALISM!

Webster's New World Dictionary defines "socialism" this way:
. . . the theory or system of ownership and operation of the means of production and distribution by society or the community rather than private individuals . . . in Communist doctrine, the stage of society coming between the capitalist stage and the communist stage, in which private ownership of the means of production and distribution has been eliminated, as in the Soviet Union . . .

munications Subcommittee on Senator Goldwater's new cable bill (S. 2172) we pointed out that there were provisions in the bill that allowed municipal ownership. We noted that, even though the bill puts some limitations on that ownership, it is still allowed and we were somewhat surprised that Mr. Goldwater, of all people, would introduce a bill that sanctioned municipal ownership — **socialism.** We were warned that those were pretty strong words to be saying, and possibly we would want to "tone it down" a little. We didn't, and Mr. Goldwater took the comments in the spirit they were delivered: **an honest concern.** We see no reason to mince words on this issue. Municipal ownership of cable television is a classic case of socialism, and we think any community considering such a course should be told that in just those words.

We recommend that you tear out this CATAtorial and give it to the local newspaper in any town that is **even** considering municipal ownership of cable television. The definition could not be more apt, and more people should be made aware of it. Now there are a few traditional arguments that come up whenever we dispute the **"right"** of the local authorities to decide how best ot use **"their"** streets and ways. First, it should be pointed out that the only reason that the municipalities have **ANY** control over cable television is because we use the streets and ways. Theoretically their "control" ends as soon as they are satisfied that we will not interrupt the free flow of commerce while we are constructing our systems. Clearly things have gone far beyond that now, and we are not sure why.

What gives the city the right to tell us what type of programming should be on the system, or what the technical configuration of the systems will be (with the exception of safety considerations)? **Where did the city get the right to run private businesses?** Again, we go back to the use of the streets and ways and we should point out that gas stations, for instance, depend totally on the streets and ways too — they create all sorts of traffic tie-ups when the lines get long, and the make **ALL** their money from folks who use those streets and ways. Should the government take over that industry too?

The rallying cry of those in favor of municipal ownership is that "public power" or municipally owned utility systems prove the viability of the concept of municipally owned cable systems. Nothing could be farther from the truth. While it is clear that telephone service, or electric service, or sewer service is a "utility" in that just about everyone in our society uses those services, cable television is not.

At the present time only about fifty percent of those who have cable television available to them take the service. Clearly that is not a utility. If local governments got into the cable television business they would find themselves having to market a luxury service rather than simply offer a utility. It is not a matter of simply hooking up every home with electricity, it is selling goods and services from basic service through data transmission and alarms, pay services and news.

Municipalities have no experience in private enterprise, nor should they. Our Constitution specifically separates the functions and the freedoms of the press from government, yet municipal ownership of cable systems contemplates the government **OWNING the press!** Once that ownership is a fact there is no way to legislate against control following. There is no such thing as "free market" socialism.

The Community Antenna Television Association is committed to maintaining the free marketplace, both of ideas and of commerce. We believe that a warning bell must be rung loud and clear to alert any community contemplating municipal ownership of cable television or any other private enterprise, for that matter, of the danger to our system of government that is involved. We ask for your help in getting that message across. If you know of any community considering municipal ownership of cable television **please contact our Washington Office — and please, send that community a copy of this CATAtorial as well** — at least it will start the bell toiling. □

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Independent Survey
Conducted Among Cable Operators

Some very interesting opinions and results of a very detailed and meticulous survey were recently brought to the CATJ office by Douglas Howe, Director of Marketing for Oak Communications, Inc., and as we perused the findings, it occurred to us that our CATJ readers might be very interested in this information as well.

To preface your examination of the material, we want to assure you that this survey was commissioned by Oak Communications to an independent firm, being conducted between December 8, 1981, and December 15, 1981, with the results being released to Oak after the first of January, 1982. The information was gathered from telephone interviews with 98 MSO's, with the differentiation being under 8,000 as small and above that figure, large. The interviewees were chosen at random from General Managers to Chief Engineers to Presidents, and included a group of both customers and non-customers of Oak. Hence, it is an **independent** study and the facts tell the story! We were told that the Oak people still did not have the names of those companies who were involved in the study, although they would like to have them.

The questions asked regarded a reflection of the Oak purpose in having the study taken — to probe opinions on cable manufacturers and their service to the industry, problems facing the industry today, emerging technologies and the future of cable. The findings are reported in three major areas:

* Grading of manufacturers on equipment, marketing and manufacturing claims, service and repair capabilities.
* Prediction of the future of cable, including their own expansion plans, future sources of revenue, and cable subscriber trends.
* Examination of cable techology, and identification of growth technologies.

As you look over the figures, you will see that these cable operators reveal their high expectations and demands for excellence in the tough marks they give cable manufacturers. They reveal measured optimism in their predictions for the future, but also unlimited confidence that they will survive and surpass the competition. They showed a keen interest in particular cable technologies, and suggest the technological direction for the industry in the next decade.

GRADING CABLE MANUFACTURERS

Equipment reliability and maintainability are the most important purchase consideration factors in selecting a cable manufacturer. Ninety-eight percent of the cable systems name reliability the most important; 85% name maintainability. Price, specific features and innovative technology receive the fewest mentions.

Overall, they feel that new technologies will perform according to manufacturers' promises. However, there is some dissension: over half of the respondents said that "blue sky" claims by manufacturers is a problem. Most think it is a serious problem, particularly among the large MSO's. "Blue sky" claims is not only a serious problem, it is a persistent one. Most that said it was a problem felt that it was not likely to diminish in the future.

Although service and repair facilities were identified as the "most valuable" service a manufacturer can offer, the majorijority felt that manufacturers do fer adequate service and repair capability. In fact, half say they intend to build their own diagnostic and repair centers. Concern about adequate service and repair support is particularly strong among the smaller MSOs interviewed.

PREDICTIONS FOR THE FUTURE

The cable systems interviewed will be rebuilding the 1980's — literally. A typical report is that by 1985, 52% of the plant will be rebuilt. This is particularly true of the smaller MSO's. Although the large and small agree that customer service and marketing will have the greatest impact on growth, they disagreed on the relative importance of these factors. The larger attribute growth to "marketing" with the smaller pointing to "customer service". They also predicted that entertainment will continue to be their greatest source of revenue through the 1980's. By 1985, they expect the average percentage of revenue from entertainment to be 84% and by 1990 — 77%!! Revenue generators in 1990 will include more special events, plus home security, shopping, and banking at home, with confidence being shown that both revenue-per-subscriber and per-subscriber expenditure on cable with double by 1985. The larger ones were bullish on how much they believe subscribers will pay for cable.

EXAMINATION OF CABLE TECHNOLOGY

Addressability is identified as the most significant cable technology today, and in the future. Signal security, 500 MHz and interactive service all receive fewer

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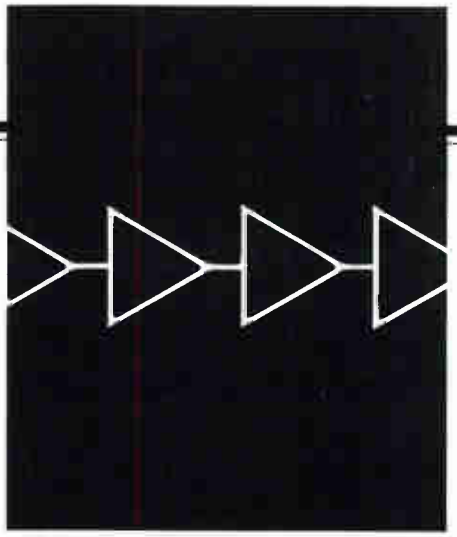
How many 440 MHz amplifiers do you need to go 30 miles?



How many indeed? At two regular cable amplifiers per mile you'd need 60 of them. But you know a cascade that long won't work. All you'd get is noise and interference.

The AML alternative. If you use Hughes AML the answer to the headline question is "one." From our transmitter input to our receiver output 30 miles away, the composite triple beat and synchronous cross modulation is equivalent to just one cable amplifier.

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NEW AML system designs provide more than 160 channels

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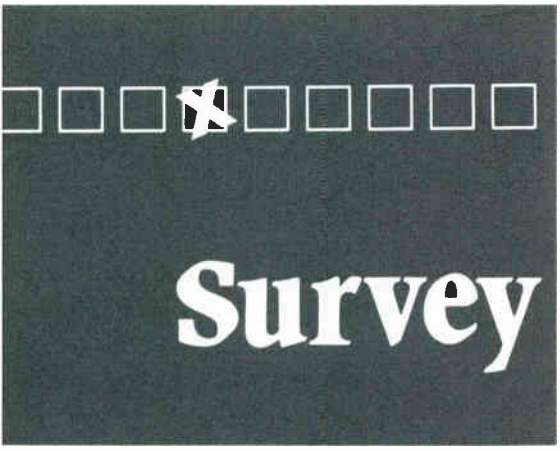
mentions than addressability. For today's cable systems, half of them said that the ideal channel capacity for home terminals is 35 channels or less, and they do not feel that DBS poses a threat to them today, nor do they feel it will have an inhibiting effect on their growth.

AND NOW FOR THE FINDINGS . . .

The following notes apply to assist you in reading the tables in the following report.

1. Percentages read across when % signs appear in left-hand columns. Percentages read down when % signs are at the top of columns.
2. Throughout the report, - signifies any value less than 1/2 of %.
3. Where percentages add to more than 100 (or the total shown) it is due to multiple answers.
4. Where individual figures add up to less than the total or less than 100%, the differences are due to the exclusion of the "no answers".
5. Where figures do not add to totals shown, differences are due to "rounding" the percentages.
6. All bases are unweighted.
7. Small MSOs are defined as those with **less than 8,000** subscribers, and large MSOs are those with **8,000 subscribers or more.**
8. The "median" is that value which falls in the middle when the measurements or numbers are arranged in order of magnitude.



How important is each of the following factors in selecting an equipment supplier?

% Who Say "Very Important"

	Total
	98
Base:	(100%)
Equipment reliability	98%
Equipment mantainability	85
Good design	80
Suitable delivery terms	76
Manufacturer's product support	68
Price	48
Specific equipment features	46
Innovative technology	39

GRADING CABLE MANUFACTURERS

These cable systems feel equipment reliability and maintainability are important factors in selecting a manufacturer.

When asked about the importance of various factors in selecting an equipment supplier, the top two mentions are for equipment reliability and equipment maintainability.

Ninety-eight percent say equipment reliability is "very important" and 85% say its maintainability is.

When asked about speed of delivery, most say lead time to obtain equipment is currently less than eleven weeks.

More than three out of four (76%) say it takes less than 11 weeks to obtain distribution equipment; 66% say this of headend equipment and 52% say this of home terminals.

There is a positive feeling about the performance of new technologies.

Almost one-third (31%) feel very confident that new technologies will perform as promised by manufacturers.

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

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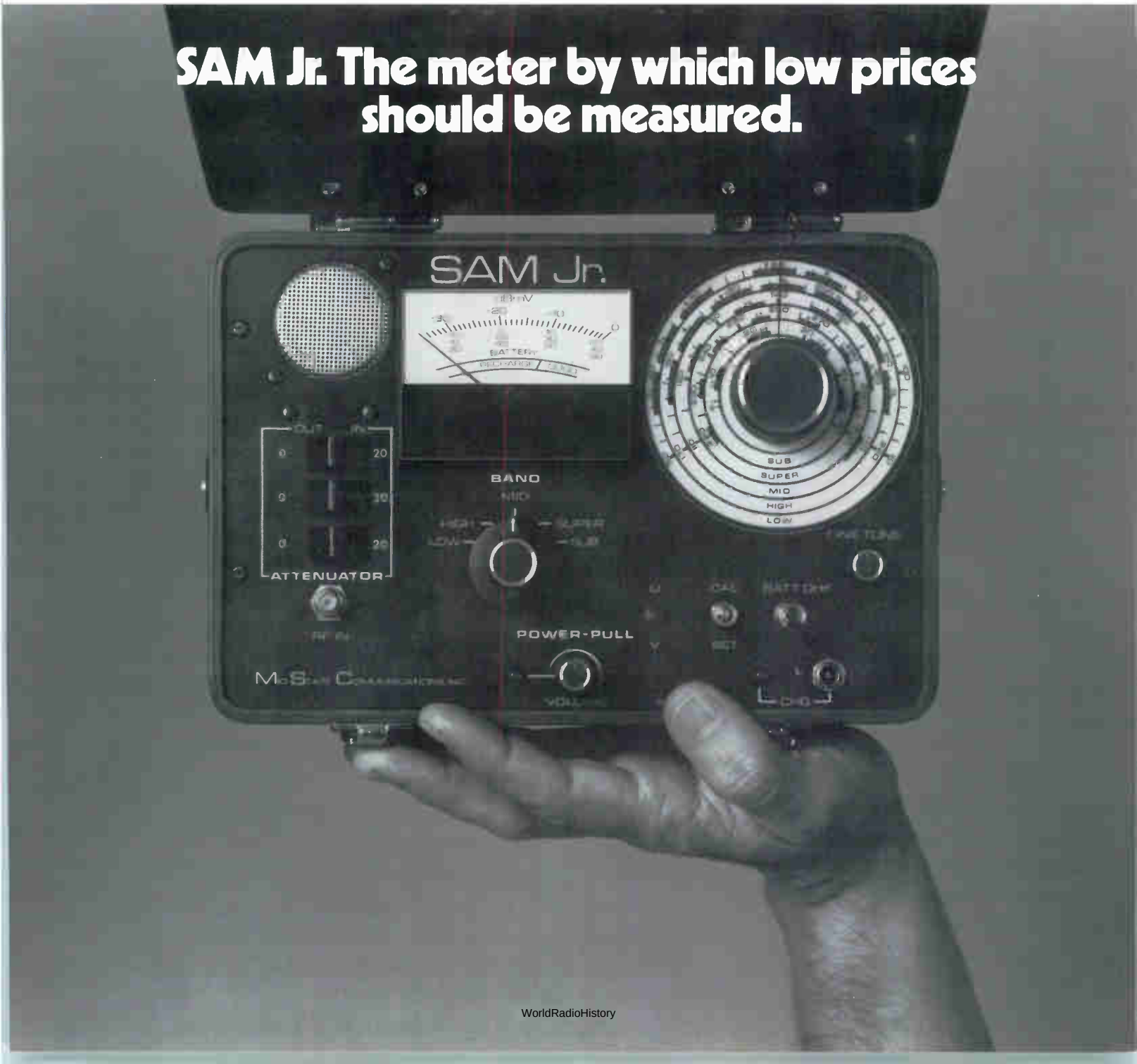

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Approximately how many weeks' lead time does it presently take to obtain headend equipment? Home terminals? Distribution equipment?

	Total	Headend Equipment	Home Terminals	Distribution Equipment	
Base:	98 (100%)				
5 Weeks or less	17%	32%	32%		
		66%	52%		76%
6-10 Weeks	49	20	44		
11-20 Weeks	22	19	16		
21 Weeks or more	11	16	7		

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However, it should be noted that the "fairy confident" category (52%) includes people who are sure they are "fairly confident" and people who *aren't* sure they are "fairly confident." For this reason, this response is somewhat suspect.

Some of the reasons given to explain why they are "not too confident" about the new technologies are:

"Based on my past experience with equipment—the companies weren't too reliable."

"The equipment is not perfected, or it is still in the experimental stages."

"Manufacturers are producing too much product and it is not being checked well—we've had to do a lot of repairs."

How confident are you that new technologies will perform as promised by manufacturers? If you are not confident, why do you say that?

	Total
Base:	98 (100%)
Very confident	31%
Fairly confident	52
Not too confident	16

They feel 'blue sky' claims by manufacturers is a problem.

Larger systems are more likely than small to feel this way — 65% vs. 49%. Among all who feel this way (57%), 88% say it is a "very or somewhat serious" problem.

Furthermore, 57% say it is "not likely" that by 1985 the problem of 'blue sky' claims will have been eliminated.

Do you think 'blue sky' claims by manufacturers about their technology is a problem?

	Total	Small	Large
Base:	98 (100%)	51 (100%)	43 (100%)
Yes	57%	49%	65%
No	42	49	35

How serious a problem is 'blue sky' claims by manufacturers about their technology? (asked of those who say there is a problem)

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	Total	
Base:	56	
(Those who say there is a problem)	(100%)	
Very serious	27%	88%
Somewhat serious	61	
Not too serious	12	

How likely is it that by 1985 the problem of 'blue sky' claims will have been eliminated? (asked of those who say there is a problem)

	Total
Base:	56
(Those who say there is a problem)	(100%)
Very likely	5%
Fairly likely	36
Not too likely	57

A service and repair facility is a valuable service for manufacturers to offer.

More (30%) mention this service as "most valuable" than any other.

However, small and large ones feel differently about these services. It appears that "repair" is a topic of greater concern to smaller ones than large. Twice as many smaller as larger (30% vs. 14%) feel that training of in-house service personnel by manufacturers is the most valuable service.

Most feel they are not provided with enough service and repair capability by manufacturers.

Fifty-eight percent feel this way.

Some of the major reasons for those who feel this way are:

"Repairs take too long and downtime is too lengthy as a result" — 37% mention this.

"It takes too long to get equipment back from repair" — 35% say this.

"Manufacturers don't repair their own products. They have to use an independent repair service" — 14% mention this.

Do you think manufacturers are providing enough field service and repair capability?

	Total
Base:	98
	(100%)
Yes	41%
No	58

Which of the following services do you consider the most valuable to you?

	Total	Small	Large
Base:	98	51	43
	(100%)	(100%)	(100%)
Service and repair facility	30%	33%	27%
Simplified product designs for easy repair	21	28	16
Training of your in-house service personnel by manufacturers	21	30	14
Better service manuals	16	16	14
Field service reps who come to your plant	9	6	14
	(Major Mentions)		

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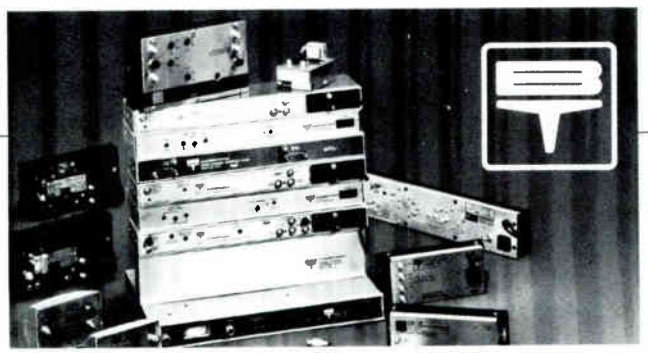
Why do you say that? (asked of those who say they do not)

	Total
Base:	57
(Those who say manufacturers are not providing enough field service repair capability.)	(100%)
Repair (Net)	70%
Length of repair/ downtime (sub-net)	37%
Too long to get equipment back from repair	35
They don't repair their own products/have to use independent repair services	14
Hard to get repairs	10
Service reps aren't knowledgeable	7
Shortage of field people	9
Had bad experience	9

Between now and 1985, what proportion of your plant will be new plant? Rebuild? Expansion of existing plant?

	Total	Small	Large
Base:	98	51	43
	(100%)	(100%)	(100%)
Rebuild	52%	61%	42%
Expansion of existing plant	25	23	28
New plant	20	16	22

Note: All figures are medians.



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They are evenly divided in their approach to solving the problems of "repairs."

About half (51%) intend to build their own diagnostic and repair center while about as many (49%) have no such plans.

However, more larger than smaller intend to build their own center — 58% vs. 42%.

Do you intend to build your own diagnostic and repair center?

	Total	Small	Large
Base:	98	51	43
	(100%)	(100%)	(100%)
Yes	51%	43%	58%
No	49	57	42

Availability of parts is the key in the speed of product repairs.

More (43%) mention parts availability as having the greatest influence on the speed of product repairs than any other factor. This is more than twice the mention of the next most influential factor — rapid identification of problem at plant — 20%.

Which one of the following factors do you think has the greatest influence on the speed of product repairs?

	Total
Base:	98
	(100%)
Parts availability	43%
Rapid identification of problem at plant	20
Field service network	16
Transportation time	13
Don't know	6

PREDICTION OF THE FUTURE

They predict they will be doing a fair amount of rebuilding.

The typical one reports that by 1985, 52% of his plant will be rebuild.

The smaller anticipate a larger proportion of their plant to be rebuilt than do larger — 61% vs. 42%.

cont. on P. 16

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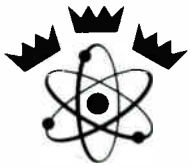

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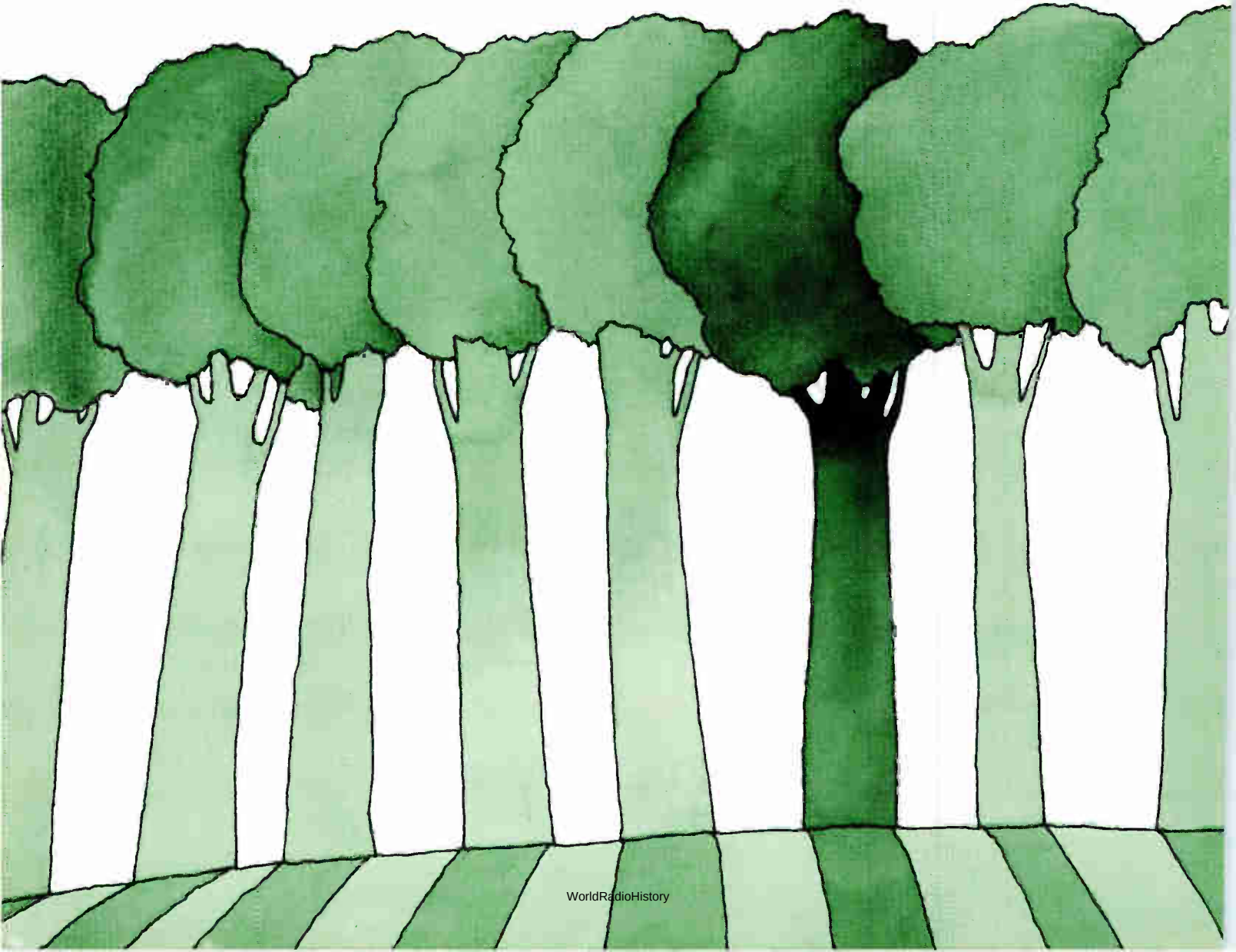
If all addressable systems look alike, you haven't looked hard enough.



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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.

First, look at the hardware.

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.

Finally, make sure everything's covered by a full year's warranty. That way you won't get caught out on a limb.

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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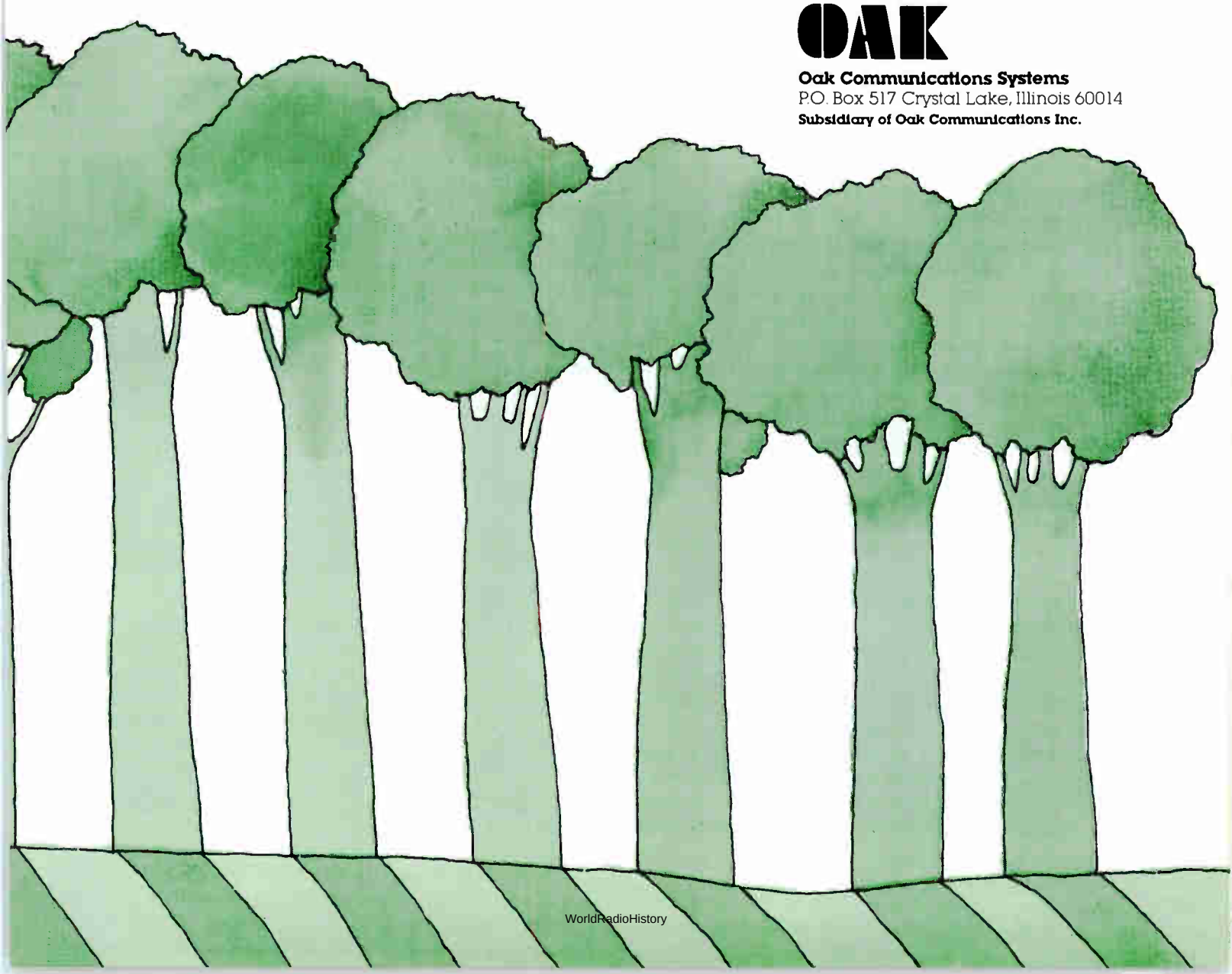

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cont. from P.12

Which one of the following activities is most important in contributing to your growth today? In 1985?

	1981			1985		
	Total	Small	Large	Total	Small	Large
Base:	98 (100%)	51 (100%)	43 (100%)	98 (100%)	51 (100%)	43 (100%)
Customer service	38%	45%	28%	29%	22%	35%
Marketing	24	14	37	28	20	37
Programming	19	16	23	21	26	16
Financial management	11	16	7	12	16	9
Engineering	4	4	5	6	10	2

By 1985, about what percentage of your revenue will come from each of the following? By 1990?

	Total	1985	1990
Base:	98 (100%)		
Entertainment		84%	77%
Home security		2	9
Shopping/banking at home		1	4
Games		2	4
Energy management/meter reading/ peak load management		3	5
Text services		1	1

Note: All figures recorded are Medians.

Survey

They say that "customer service" and "marketing" will have the greatest impact on their growth.

Small and large ones feel differently about these activities. In both 1981 and 1985, larger appear to be more "marketing" oriented than smaller.

Major Mentions: "Marketing"
1981 — 37% larger vs. 14% smaller
1985 — 37% larger vs. 20% smaller

Smaller currently seem to be more "customer service" oriented than larger with 45% major mention vs. 28% major mentions.

☐ ☐ ☐ ☒ ☐ ☐ ☐

Entertainment will continue to be the major source of revenue.

By 1985, the large ones say the averge percentage of revenue coming from entertainment will be 84%. However, by 1990 they expect the average percentage coming from entertainment to drop to 77%.

As entertainment's revenue-contribution declines slightly, they say that home security and shopping/banking at home will increase by 1990. They predict the average percentage of revenue coming from home security will increase from 2% to 9%; revenues from shopping/banking at home will increase from 1% to 5% by 1990.

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They see "special events" as a major growth opportunity, and predict that their subscribers will be willing to purchase special events.

They believe that on the average, 32% of subscribers will purchase special events by 1985.

They expect that by 1985, 17% of their revenue will be generated by special events.

By 1985, about what percentage of your total revenue will come from special events? What percentage of your total subscribers do you think will purchase special events?

	Total	Percentage Of Revenue Coming From Special Events	Percentage Of Subscribers Purchasing Special Events
Base:	98 (100%)		
Percentage			
Zero-19		47%	29%
20-49		22	32
50-100		14	29
Median		17%	32%

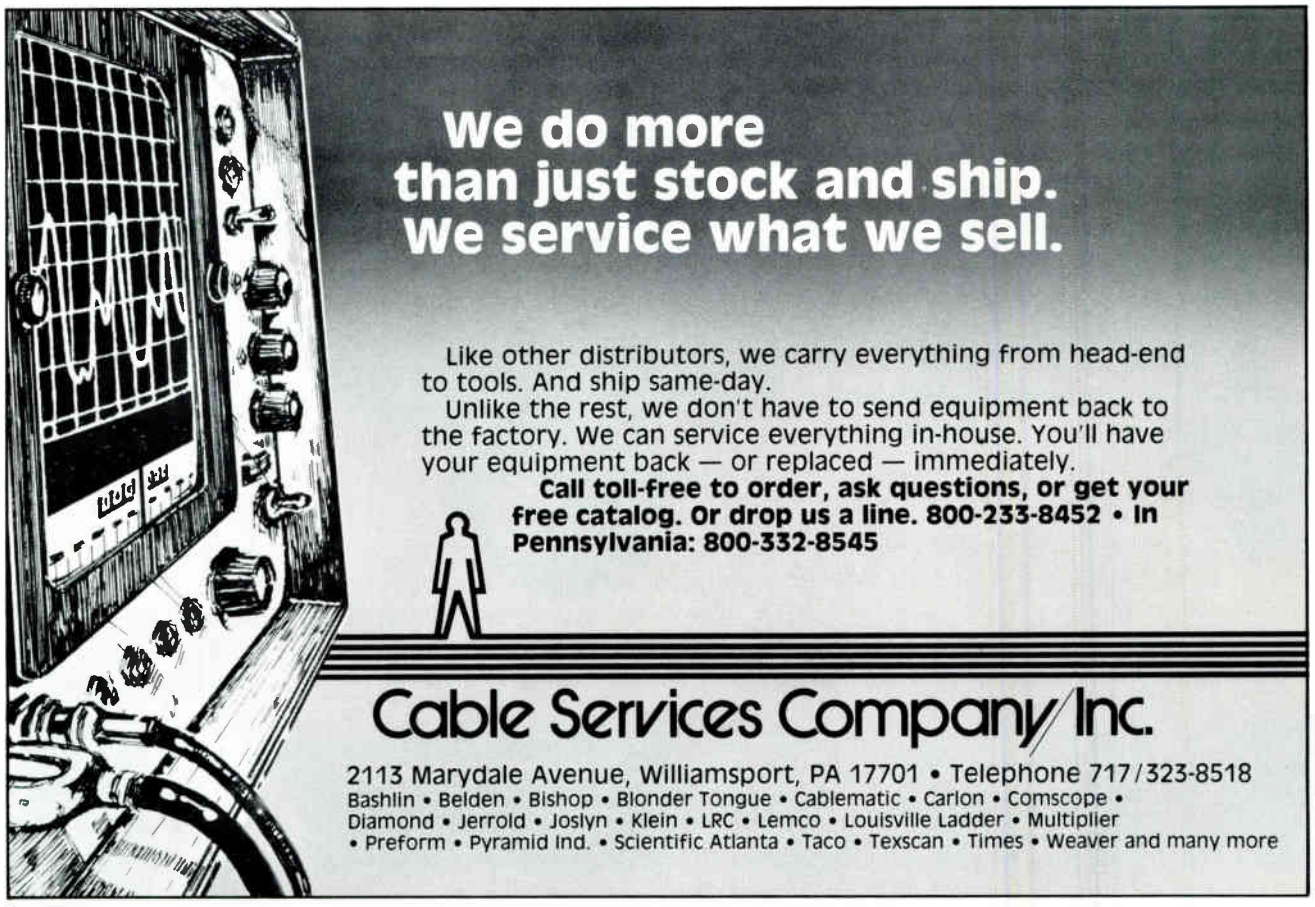
They feel subscribers will pay more for cable in 1985 — at least twice as much, on the average.

While only 4% say their subscribers are willing to pay $36 to $45 per month for cable television services now, 24% say they will in 1985.

Overall, more large than small ones predict subscribers will be willing to pay more for cable television services both now and in the future.

What is the maximum average monthly price your subscribers are willing to pay for cable television services today? In 1985?

	1981			1985		
	Total	Small	Large	Total	Small	Large
Base:	98 (100%)	51 (100%)	43 (100%)	98 (100%)	51 (100%)	43 (100%)
$15 or less	26%	31%	21%	8%	8%	7%
$16-$25	38	47	26	26	37	16
$26-$35	24	6	44	29	28	30
$36-$45	4	4	5	24	16	33
$46 or more	2	2	2	4	2	7
Don't know	7	10	2	9	10	7



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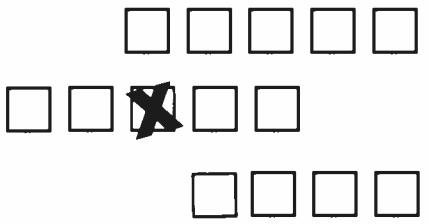
SURVEY

They are confident that revenue-per-subscriber will double for pay services.

Thirty-two percent currently get $10 to $19 in monthly revenue-per-subscriber.

Almost double that number, 60% expect to get this revenue by 1985.

While only 3% currently get $20 to $29 per month from each subscriber, 10% expect to do so by 1985.



They plan to offer fewer than five premium channels in 1985.

What monthly revenue-per-subscriber are you getting for pay services now? What do you expect to get by 1985?

	Total	1981	1985
Base:	98 (100%)		
Less than $10		57%	5%
$10-$19		32	60
$20-$29		3	10
$30-$39		—	5
$40-$49		—	2
Don't know		4	14

Approximately how many premium channels do you think you will offer in 1985?

	Total	
Base:	98 (100%)	
1-2	11%	55%
3	26	
4	18	
5	14	
6	9	
7-12	7	
15 or more	8	

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EXAMINATION OF CABLE TECHNOLOGY

Addressability is considered the leading technology.

More (46%) mention this issue then any other as the "most significant" today. It is also expected to be the most significant issue in 1985 as well (41% predict so).

More large than small agree that interactive service is a significant issue now (19% compared to 4%) and will be in 1985 (37% compared to 8%).

Which one of the following cable technology issue(s) do you consider the most significant today? In 1985?

	1981			1985		
	Total	Small	Large	Total	Small	Large
Base:	98 (100%)	51 (100%)	43 (100%)	98 (100%)	51 (100%)	43 (100%)
Addressability	46%	39%	56%	41%	41%	40%
Signal Security	29	37	19	20	24	16
400 mHz	12	18	5	12	22	2
Interactive service	10	4	19	20	8	37

One out of two agree on the ideal channel capacity.

Exactly half say the ideal channel capacity for cable home terminals is 35 or less.

Twice as many large than small feel the ideal channel capacity is 56 or less (40% vs. 20%).

Which of the following is the ideal channel capacity for cable home terminals today?

	Total	Small	Large
Base:	98 (100%)	51 (100%)	43 (100%)
12 or less	2%	2%	2%
21 or less	10	19	—
35 or less	50	55	49
56 or less	29	20	40
112 or less	4	2	7
More than 112	3	—	2

Most do not seem too concerned about DBS.

More than three out of four (78%) do not think DBS will have an inhibiting effect on their growth.

Among those who think it will, 29% say it will have "a great deal" of effect.

The majority aren't too concerned about the impact of DBS on cable in the future as well. Only 21% say it will be "very important" in 1985 and 28% say it will be in 1990.

Do you think DBS will have an inhibiting effect on your growth?

	Total
Base:	98 (100%)
Yes	21%
No	78

How much of an effect do you think DBS will have in inhibiting your growth? (asked of those who say it has an inhibiting effect)

	Total
Base: *(Those who say it has an inhibiting effect)*	21 (100%)
A great deal of effect	29%
Somewhat of an effect	57
Not too much of an effect	14

How great an impact will DBS have on cable in 1985? In 1990?

	Total	Those Who Say "Very Important"
Base:	98 (100%)	
1985		21%
1990		28%

Interesting information, right? Perhaps you would like to note your own answers to these questions. Please feel free to do so and return them to CATJ for comparison. It might be very interesting to see what, if any, change would be made in these figures and trends. Note the size of your system(s) with your answers and send them in.

We were very pleased that Mr. Howe visited us and shared the results of this study with us, and hope you have found it equally interesting. □

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TFC'S INNOVATIVE ENGINEERING BRINGS YOU AN ULTRA-HARD FOAM CORE CABLE.

To fill your need for a superior coax which better withstands the abuses of installation and use, Times Fiber Communications developed T4: a new generation of polyethylene foam core cable. T4's ultra-hard core is highly resistant to kinking during bending or forming.

T-4's very fine cell structure results from the use of proprietary nucleating agents, much harder polyethylene resins and advanced foam processing techniques. With its precise cell matrix, you get vastly improved mechanical integrity both during cable installation and after severe environmental exposure.

T4's attenuation performance is more consistant. Its gradient foam density provides a signal velocity approaching 90%. Even with the increased "foaming" of the dielectric, hardness is maintained so that ease and reliability of installation are not affected.

For a sample of this remarkable new T4 cable, contact TFC today at P.O. Box 384, Wallingford, CT 06492, (203) 265-8500.

TFC TIMES FIBER COMMUNICATIONS, INC.
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Photomicrography reveals precise closed cell structure of new T4 ultra-hard cable. (above)

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TFC'S INNOVATIVE ENGINEERING GIVES YOU SECURITY AGAINST MOISTURE INGRESS.

Your moisture ingress problems are solved with T4, a new generation of gas injected polyethylene foam core cables. Moisture ingress is blocked between the center conductor and dielectric and through the dielectric itself.

T4's powerful moisture barrier is provided by thermally activated bonding agents which encapsulate and seal the center conductor while simultaneously forming a polymeric linkage with the foamed dielectric. This precisely controlled conductor interface layer provides an effective moisture shield without sacrificing handling ease. T4 strips quickly and conveniently for reliable, scrape-free connections.

T4's cell structure is formed by the use of proprietary nucleating agents combined with advanced foam processing technology. The result is an ultra-fine, moisture blocking, closed cell matrix. Cell integrity is maintained from the conductor coating through the outside surface and remains moisture resistant through the stresses of drawing, installation and environmental exposure.

For a sample of this remarkable new T4 cable, contact TFC today at P.O. Box 384, Wallingford, CT 06492, (203) 265-8500.

TFC TIMES FIBER COMMUNICATIONS, INC.
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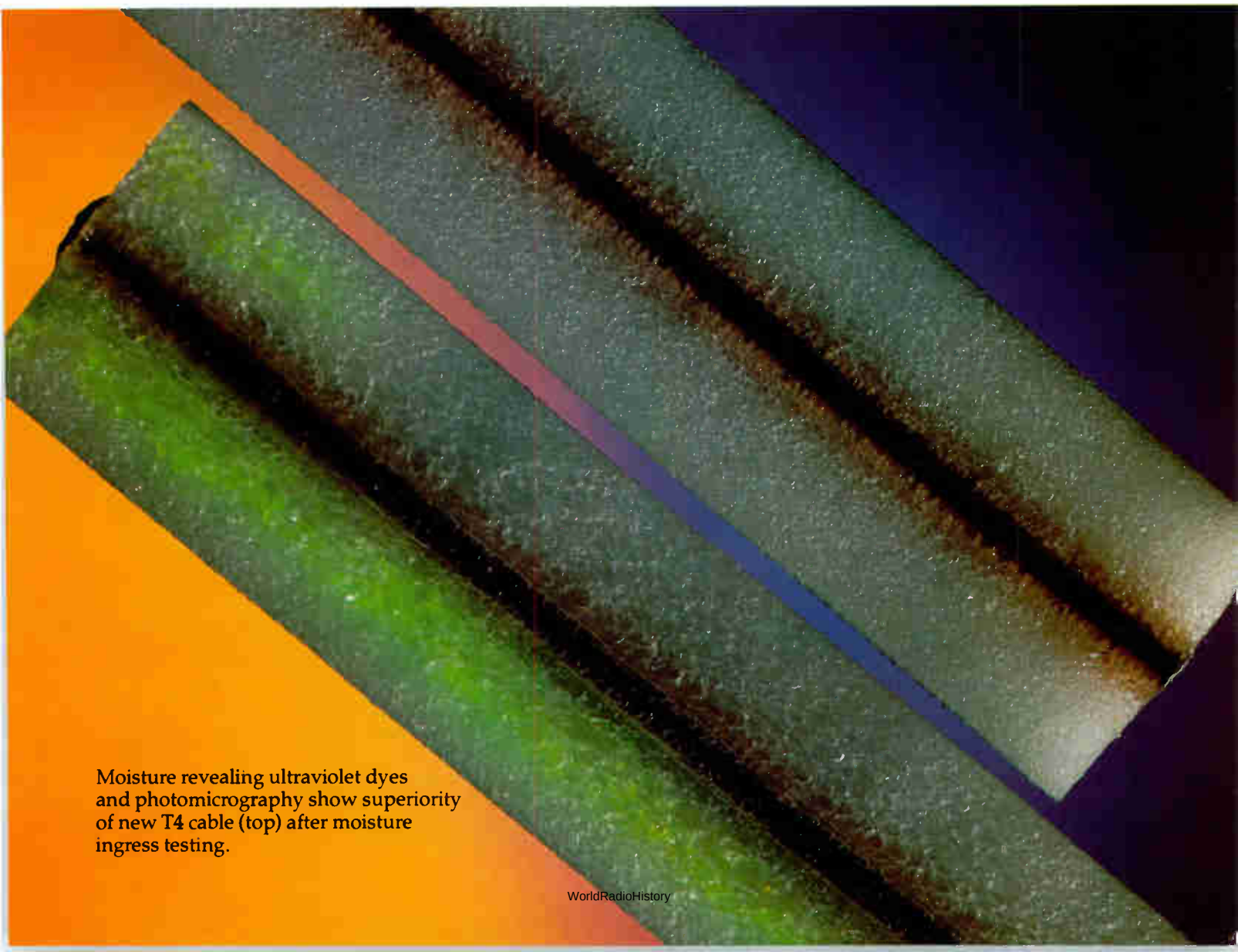

Moisture revealing ultraviolet dyes and photomicrography show superiority of new T4 cable (top) after moisture ingress testing.

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Now it was immediately apparent that we would encounter a considerable amount of terrestrial microwave interference, especially considering that the London Telecom Tower, the hub of the nation's 2, 4, 6 and 11 GHz telecommunications network, festooned with dishes and horns looking in almost every conceivable direction, rose majestically 600 ft above the rooftops not a half mile from our proposed site. Consultation with British Telecom revealed that the Soviet spot-beam channel, centered on 3675 MHz, was gratifyingly clear of any Telecom frequencies, but that interfering carriers could be expected throughout the 3.8 to 4.2 GHz region of the band. Acting on this information we went ahead with the installation, secure in the knowledge that our principal channel would be clear of interference, but with a strong possibility that other channels would be unusable.

When asked to recommend a 3-meter antenna and mount, I volunteered the information that the SatFinder was the best-engineered of the "home" systems I had seen; that with a slight modification it would give perfect geostationary orbit tracking; but, being a quality product it was not the cheapest in the field. Sonic Sound liked the idea of a single-axis (polar mount) steerable antenna. But with only one high-power 4 GH TV satellite at present they opted for the hand-cranked, rather than the motorized system. Now these guys knew what they wanted and they wanted it immediately. There was currently available a low-cost 2-meter antenna in the U.K., but they wanted the SatFinder for their roof, and arranged for the three-meter system, including mount, to be shipped out of Tulsa, Oklahoma by air that very day, bound for London. It meant that they paid more in freight charges than the cost of the antenna, but the result was they had it assembled at their London warehouse just over a week later.

PHOTO 1 — 250 ft. above a London street, Sonic Sound's SatFinder antenna looks towards a Russian satellite over the Telecom Atlantic Ocean. The top of the British Tower can be seen in the back ground.

I had by this time obtained and modified the electronics for the installation. I had specified a dual-conversion receiver with remote downconverter, and the one which happened to be available was the "Entertainer" by Satellite Supplies Inc. This turned out to be a single-board unit, manufactured in Korea, and was immediately recognizable as a descendant in direct line from the first Tay Howard home TVRO receiver. The downconverter was nicely made and weatherproofed in a very solid aluminum alloy box, with remotely tuned VTO and head amplification provided at the first IF, approximately 850 MHz. The demodulator was of the encapsulated hybrid divide-by-two-and-PLL type, otherwise it was virtually identical to the early SATRX. Styling a little old-fashioned, very American, not quite the sleek hi-tech look that wins admirers in the audio and video stores of London's West End.

But it worked well — especially considering its demodulator design and the wide deviation values employed by the Soviets. The main transformer was changed for one with a 240-volt

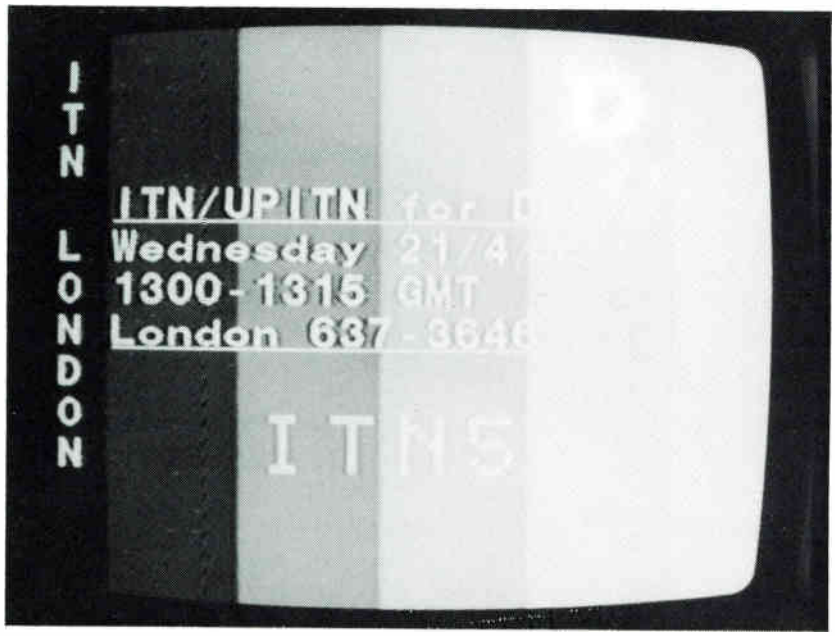

PHOTO 2 — News from London and the world! The UPI/ITN collaboration transmits a news package at 1300 GMT (0900 EDT) each day, via Intelsat in PAL color, which is also relayed by the Gorizont global beam in SECAM color, and can easily be received in eastern USA. 3875 MHz, 14°W, 7.5 MHz subcarrier, I reckon it has travelled 92,000 miles, including a trip through Moscow, by the time it finds its way back to Sonic Sound's terminal in London!

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primary. Video de-emphasis components were changed to give the 625-line characteristic. Video filtering was modified to improve response. A trimmer pot was added to give fine adjustment of PLL tracking range, and eliminate "sparkly-edges" on the test card. AFC loop was adapted to incorporate controlled frequency feedback to handle the Russian dispersal. Video output was changed to give a true 75-ohm source impedance. Audio demodulators were retuned to 7.0 and 7.5 MHz and the Birkill pilot-tone expander module was inserted in the 7.0 MHz output. A variable-gain IF pre-amp was fitted, to cope with the 500-foot cable run from the roof to the showroom. And a channel 36 UHF modulator, to enable the output to be viewed on a standard British TV, as well as on monitors.

The LNA was the Dexcel MIC type — a selected 120°K unit — and the feed a standard Chaparral with quarter-wave vane added for circular polarization. The whole system was proved and aligned on my own 8-foot antenna — the first American TVRO hardware to operate at this location.

The roof of the building offered a spectacular view out

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across London. The only higher points within a half-mile radius appeared to be the Telecom Tower to our northwest and the giant 36-story Centre Point block, southeast of us. The top of Centre Point had an elevation angle of some 20 degrees, but it was well below the geostationary arc at that point. From the dome of Saint Paul's Cathedral and the NatWest Tower and Barbican in the east, up over the Shell Centre, Nelson's Column, Big Ben and the Houses of Parliament in the South, round over Battersea Power Station and the London Hilton to the western horizon, almost 150 degrees of Clarke Orbit were in view. A location was chosen on one of the two elevator motor housings, the highest points on the building, and the Thorn-EMI people set about providing steel girder work anchored to the building frame as a foundation, while cables were run through the building's warren of ducts to ground-floor level, where the receiver was to be displayed.

As soon as the foundation was complete, a day was fixed for the installation. April 22 proved to be a warm, dry day with light winds and hazy sunshine. The morning saw assembly of the antenna and mount onto the prepared base, while I drove down from Sheffield with the electornics and some test gear. The contractors had marked a "north/south" line on the base, but a quick solar transit check at local noon showed it to be in error by a massive fifteen degrees. Perhaps they had excluded British Summer Time from their calculations. But this was not a problem, due to the excellent orientation adjustment provided on the SatFinder. With the aid of an Ordnance Survey map and a makeshift theodolite, bearings were taken on the two TV broadcasting towers, just visible through the haze, seven miles away in south London, and the mount adjusted to true north/south alignment. Setting the polar mount was less straightforward, as it was not possible with the unmodified SatFinder to achieve the required declination offset of 6.78 degrees between antenna plane and polar axis, as required for perfect tracking as latitude 51.52°N. So a compromise setting was reached with some four degrees offset and the polar axis inclined to a value between true polar and modified polar. This was to prove acceptable.

The actuator was attached in the easterly position while the LNA and feed horn were fitted, but it was decided to look at our primary target first. Cranking hard against the westerly stop, I figured we should be close to the 14°W bird. Connecting the narrow-band receiver with built-in spectrum analyzer revealed the extent of our opposition. At 30 MHz intervals throughout hte upper four-fifths of the band were carriers 80 dB above analyzer noise. Intermod pro-

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Arlington, TX 76011
(817) 261-1111

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ducts extended outside this range and with the 'Entertainer' downconverter in circuit there were 'image' carriers tuning in the opposite direction, despite its input bandpass filter. Switching to demodulator revealed that most of the interfering signals were FM/FDM telephony and data channels, plus some TV. But wait — there's a TV signal with SECAM ident . . . and there's another! We realized the antenna was indeed aligned directly onto the Soviet bird, and there were the familiar three channels battling through the terrestrial garbage, despite being 50 dB lower in level at this look angle. And the Moskva spot-beam channel sat right in the center of the only clear spot on the dial, its slow dispersal revealing its unmistakeable identity.

Clearly any serious Intelsat work was out of the question here, even with a fully Glyn Bostick job. But having confirmed that our marketable channel was interference-free, we set out to scan the rest of the sky. First to the Indian Ocean, and there were Inteslat transponders one and two from 60°E. No TV though, as the leases operate higher up the band and were completely lost in the interference at this low elevation angle. Climbing up the eastern sky, the next bird was the Indian Ocean Gorizont, again with its 3675 TV channel well clear, the others difficult. Raduga at 35°E suffered a similar fate, with telephony only on 3675. We decided to survey the western sky, so the actuator arm was transferred to the opposite side of the frame and we went west from 14°W. At 18.5°W, up came the big telephony carriers of Intelsat IV F1, the Major Path 2 Atlantic Bird. No TV on that one this afternoon. On westward to the Intelsat IVA F1/F2 cluster at 21.5°W, and there was the Saudia Arabian announcer in his robe and head-dress, out in the clear on transponder 1E, SECAM color. No luck though with the other leases on this bird, in amongst the big terrestrial spikes. 24.5°W, to the Atlantic Primary cluster of Intelsat V F1 & F3, and there on global beam transponder 12 was a news report from Argentina, 525 lines NTSC and a little noisy on the 3-meter terminal! The character generator ident revealed the interesting fact that the report was transmitted via Uruguay and uplinked via the Brazilian Tangua earth station. Further westward to Major Path 1, Intelsat IVA F4 at 34.5°W, the home of the Spanish lease and much transatlantic traffic, although no TV was to be found at that time. At this point the Telecom Tower was just 90 degrees off to the side of our antenna, and the rooftop was becoming quite cool and windy, so it was decided to look onto the Soviet satellite and adjourn to the shop premises below.

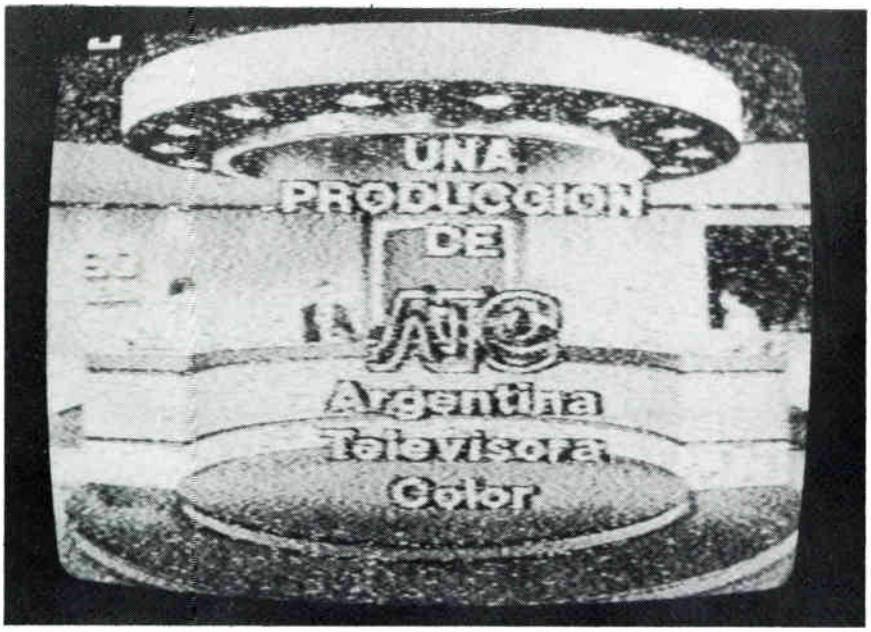

PHOTO 3 — The Falklands/Malvinas crisis has resulted in more Argentine TV on Intelsat than we have seen since the last World Cup soccer series. This is from an Intelsat V global beam, received on my own 8-foot antenna.

Having carried all our gear (including TV camera and U-Matic as well as triple-standard Betamax recorders) down a ladder, two flights of stairs and twelve floors of elevator to street level and round to the retail shop entrance, it was well into the evening so we were spared the attentions of the general public. The two cable ends were terminated in BNC connectors and a 27-inch Sony 3-standard monitor coupled to the "Entertainer's" output jacks. Power was applied, the tuning knob rotated and there on the screen was Russia's coverage of the ice hockey championships from Finland, full color, crisp audio and no trace of sparklies or residual dispersal. The hemi/zone and global beam channels, sitting respectively directly between and hard up against the terrestrial carriers, required a further small modification to the "Entertainer'. A switch was fitted to disable the AFC, which otherwise locked onto the adjacent interference, some 50 dB higher in level. All worked satisfactorily, and we celebrated our achievement in bringing a high quality satellite TV demonstration to London, England. □

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JULY 3-6
DON'T DELAY . . . REGISTER NOW FOR

CCOS '82

HOTEL CONVENTION RATE AND ROOM BLOCK PROTECTED ONLY THROUGH JUNE 12th

PRE-CONVENTION RATES:

CATA MEMBERS*	$ 75.00
NON-CATA MEMBERS	$125.00
SPOUSES	$ 25.00
CHILDREN OVER 16	$ 25.00

AFTER JUNE 15th, REGISTRATION FEE WILL BE $175.

**Must Furnish System Name for Verification*

CCOS '82

JULY 3-6

Enclosed is _____ to cover registration for:

Name _____

System _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____

Name of Spouse _____

Names of Children (and ages) _____

Send to: CATA CCOS '82

4209 N.W. 23rd, Suite 106

Oklahoma City, OK. 73107

WorldRadioHistory

ORDER YOUR DISCOUNT TICKETS FOR OPRYLAND PARK TODAY!!!!

ADMISSION PRICES AT DISCOUNT RATE

One-day Admission (age 4 and over) . . . . . $ 9.75

Two-day Encore admission (age 4 and over, must be used on two consecutive days) 15.00

DEADLINE FOR ORDERING JUNE 14TH!!!!!

Enclosed is $_____ for _____ one-day advance admission tickets and _____ Encore admission tickets to the Opryland Park to be held in the name of:

Name _____

Address _____

City/State _____

Telephone _____

Tickets may be picked up at the Registration Desk outside Ryman Hall during registration hours on Saturday, July 2nd, 1:00-5:00 p.m. and on Sunday, July 3rd, 1:00-4:00 p.m.

CCOS '82

Enclosed is $_____ for _____ tickets for the late performance of the Grand Ole Opry, July 2, 1982. Please reserve these tickets in the name of:

Name _____

Address _____

City/State _____

Telephone ( ) _____

Tickets will be available for pick-up Saturday at the Registration Desk outside Ryman Hall from 1-5 p.m.

ORDER YOUR TICKETS TODAY TO BE ASSURED OF SEATS FOR THIS SATURDAY PERFORMANCE!!!!!

Saturday, July 3, 1982
9:30 p.m. Show
(Buses will be provided from Opryland Hotel to the Grand Ole Opry Theater)
$8.00 each
(Children under 3 free if held)

WorldRadioHistory

CCOS '82 DON'T DELAY REGISTERING ANY LONGER!

If you have not already registered, there are many reasons why you should. **First,** the program and supplier representation will make it a most worthwhile experience for the cable operators and technicians. The technical and management sessions are those that have been asked for by cable operators from former CCOS meetings; returning to the program this year will be the "hands-on" sessions that were always so popular. But again, space is limited, and to fit this session into the rest of the program you wish to attend, you must make your reservations for this session IMMEDIATELY to insure you a spot during the time you have chosen. The three sessions are not yet filled, so you still have this opportunity to get your name listed.

Secondly, to make this trip as reasonable in cost as possible for you, we arranged for a convention rate on the hotel rooms — that is $62, for a double or single. However, **our room block and that price is guaranteed only for those reservations made prior to JUNE 12;** after that time, the rooms will go at their regular in-season rate and on an availability basis only, and with the World's Fair right down the interstate in Knoxville, interest is running at fever pitch for accommodations in that area. In other words, you might not have a room at the Opryland Hotel if you delay.

This room availability has always been a problem at CCOS — we understand that attendees don't want to stay anywhere other than the convention headquarters where the sessions are and where the exhibits are. We have done everything we can do to insure you that won't happen in Nashville — BUT, the rest is up to you!!!

Another deadline is June 15th which the CATA Board set as the deadline for advance registration. As the registration form indicates, CATA members can register before June 15th for $75.00 and non-CATA members for $125.00. After June 15th, **REGISTRATION FOR EVERYONE WILL BE $175.** A $25.00 fee each for spouses and children over 16 will be charged, and that fee will remain the same regardless of date of registration.

If you haven't decided about attending, again examine the program and the summation of the different sessions as they will be presented. We think you will find it most worthwhile and beneficial to the operation of your cable system. In the case of the Management sessions, we know that many of the ladies are instrumental in the paper-work department, and they are welcome at any of the sessions that they desire to attend with no other registration fee than the one mentioned above.

Also, to some of the suppliers, we would like to say that the session on basic information on the operation of a cable system would be very helpful to some of your people new to the cable industry, and we encourage their attendance at any of the sessions, but this one in particular.

The Open Forum will be concerned with Municipal Ownership and Re-franchising — two very big problems facing the cable operator. There will be a representative from the National League of Cities present to answer questions and participate in the discussion, and this should prove to be a block buster session with the dialogue. Naturally, Copyright will be re-hashed.

Everything connected is a plus — do yourself a favor and join us. Not only will the program be beneficial, but CATA's CCOS '82 will bring you into one of the most historic and interesting sections in the United States, and that too will be a plus for you and your family. Don't delay another day — use the attached form to register.

Take another look at the program — 'nuff said!

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MANAGEMENT SESSIONS

"OPEN FORUM — REFRANCHISING"

Again, an Open Forum will be presided over by CATA Executive Director, Steve Effros, and presented with representatives from various factions present (such as a representative from the National League of Cities) to discuss important cable issues (excluding Copyright — there's another session for that!), focusing on refranchising, community ownership and legal problems facing the cable industry. The format of the open discussion was very well received at CCOS '81, and it was suggested that we again provide the forum to exchange viewpoints with open discussion. Having representives from other groups should lend itself to a healthy and informative discussion!!

"SURELY INSURED"

Representatives of Franey & Parr Insurance, as well as the Firemen's Union Insurance Co., will explore insurance coverages for cable television systems, including specific insurance plans tailored to the needs of small, medium, and large cable systems. This session will cover what insurance you should have, participation in safety and inspection programs to reduce rates, Workmen's Compensation, classification of employees, etc. This session is designed to appraise your insurance coverage, to determine if you have enough or not enough, and ways to save money on premiums. This could prove to be a very valuable session for managers!

"THERE IS A WAY TO HELP SOLVE NON-PAY, BAD DEBT PROBLEMS"

If you have been having difficulty collecting your monthly subscriber dues, this presentation should help you work out the problems with those "non-pay" subscribers. A representative of Transworld Systems, Inc. will give you helpful information and facts to tell you how to approach this problem of collecting bad debts.

"DUNGEONS AND DRAGONS — THE COPYRIGHT MONSTER BREATHS FIRE AGAIN"

Don't miss this one! Steve Effros has vital information for you concerning Copyright, and this session will bring you up to date. This is an important and vital issue, and at this time, Steve will explain what CATA's plan of action will be on this matter and what you need to do to protect your interests.

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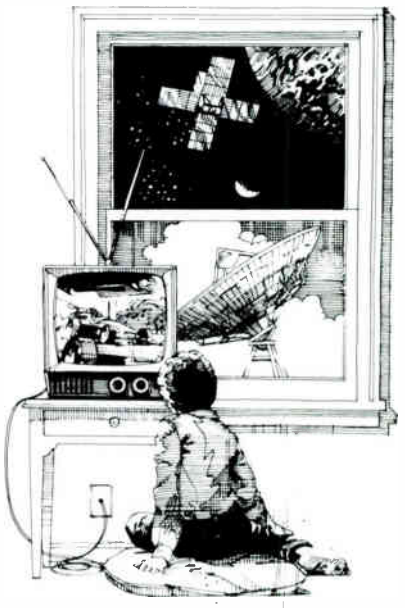
MANAGEMENT SESSIONS



"CAN WE AFFORD TO FINANCE REBUILDS AND SYSTEM UPGRADING?"

Chris Flor, Heller Oak Communications Financing Corporation, presents an in-depth study of where the smaller and independent cable operator stands when the time comes to sell or rebuild/upgrade his cable system. Don't sell out until you attend this session — it could make a big difference to your profits!

"ADVERTISING ON CABLE PAYS!"

Saralee Hymen, representing the CABLE TELEVISION ADVERTISING BUREAU, will discuss how to go about earning additional revenue through advertising, regardless of the size of your system. Covered will be details about local, regional, and national advertising on cable and information on how to get assistance to get your advertising program initiated on your system.

"AD SPOTS ON SATELLITE PROGRAMMING"

Speakers for this session will be representatives from TBS and ESPN, explaining the availability of ad spots on satellite programming, the use of these spots for local advertising to a successful and profitable result, and the training of your cable system staff to sell advertising spots on your system.

"EQUIPMENT AND INTERFACE"

Are you wondering about what equipment you will need for using advertising spots on satellite programming and local origination channels? How are you going to interface this equipment into your cable system? This session will provide that information; plan to attend all three seminars dealing with advertising, and you will have the answers as to what to do, how to do it, what it will cost, and how much it can return in revenue. No doubt about it, this is a real dollars and sense session!

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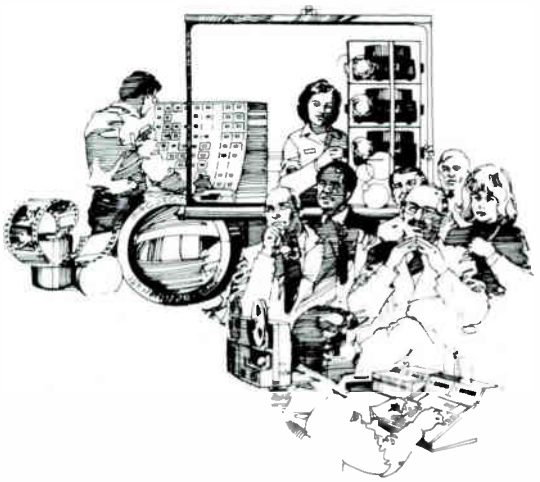
TECHNICAL SESSIONS



'WHAT IS A CABLE SYSTEM"

One of the most popular sessions at CCOS '80 was the session presented by CATA Director of Engineering, Ralph Haimowitz, on "back-to-basics". This session will be an expanded version covering equipment familiarity and the basic technology of a cable television system from the signal sources to the subscribers' TV sets. This seminar was designed for the non-technical owner/operator, cable television office personnel, and new sales personnel from the suppliers group, and will prove to be an invaluable tool of learning and understanding for those attending. Perhaps you have someone new with your company; this will be the ideal exposure to a basic approach to the "hows and whys" of a cable system. We want to emphasize that this will be tremendous assistance for manufacturers and distributor sales personnel to enable them to better understand the needs and uses for their products and services as they apply to a cable system.

"BIG BUCKS IN A SMALL TOWN"

Richard Kirn, Sarasota, Florida, an expert in the field of really **small** cable systems, will present this in-depth session on rural cable television systems, including new system design concepts, expansion of existing systems, inexpensive re-design and rebuild, exploring the **when** and **where**to use line extender trunks, etc. Be convinced — the small, independent cable system is not a thing of the past. Don't miss this one if you are interested in big savings, continuing to meet or exceed technical standards.

"KEEP THAT SYSTEM EQUIPMENT OPERATING PROPERLY"

Once more the ever popular Fred Rogers will return to the CCOS program to share his expertise in the maintenance of your cable system equipment. This one is guaranteed to be another "Rogers Super Spectacular" technical session and one you absolutely should not miss. Come early or you might not find an empty seat.

WorldRadioHistory

TECHNICAL SESSIONS

"WHAT WILL TWO OR THREE DEGREE SATELLITE SPACING DO TO YOUR TVRO RECEPTION?"

A troublesome question!! Our panel of experts will present their views, facts, and data on what 2° or 3° spacing will do to your satellite signals should this spacing be approved. This is a most controversial subject, and from this session you will learn what is required to meet minimum technical standards, as well as options open to cable operators. If you have a five meter dish, or smaller, you won't want to miss this session. It will include information on sizes and types of earth station antennas, including multiple satellite receiving antennas. Representatives from HBO, Harris Corporation, Antennas for Communications and Microdyne Corporation will participate in this presentation.

"LET'S ANALYZE THE SITUATION"

Do you remember the early CCOS days and the lab sessions that were packed with cable operators?'' This session has been requested continually, and we have scheduled this, with the cooperation of Raleigh Stelle, TEXSCAN CORPORATION, who will teach how, when, and where to use a spectrum analyzer in this ''hands-on'' session. For many of the new people in the cable industry, this technical session will afford them the opportunity to learn how to work a spectrum analyzer and understand what information the equipment provides by doing it. Because of the nature of this session being a lab, attendance will be limited to thirty in each lab session; if you are interested. register for this class **immediately.** We are running this session three times to accommodate those who will want to participate in the lab. We cannot stress this too much — register now by dropping a note to the address below, requesting your registration for this spectrum analyzer lab. It will be a **first come, first served** basis; check the schedule and request the specifc lab that you wish, but do it today, so you won't be disappointed!!!!

Spectrum Analyzer Lab
CCOS '82
4209 N.W. 23rd, Suite 106
Oklahoma City, OK. 73107

WorldRadioHistory

CCOS '82

LADIES ACTIVITIES

by: Mildred Fox
Ladies Activities

As we are making our plans for your visit to Nashville, we are excited about the many attractions that are available, and it is difficult to choose from the selection. As I was raised in this city, it is obvious to me the many facets of southern development and culture that thrive in this area, and I want to be able to offer the best sample of that environment to our CCOS ladies as they visit Nashville.

As the program has shown, we have left Saturday and Sunday open, with the exception of Exhibit Hours, so that the families could utilize that time to enjoy the area together. But don't forget the world-famous production of The Grand Ole Opry on Saturday night at the late performance. (Order your tickets NOW using the blank available in this issue). CATA obtained a block of tickets early in 1979 as plans were made for CCOS '82 to insure our attendees and their families of having tickets available; that's hard to believe that you would have to secure these that far in advance, but that was our advice from convention sources here in Nashville, and with the World's Fair now open in Knoxville, the area is going to be unusually populated with tourists from all over the country, and naturally, they won't want to visit Nashville without the experience of The Grand Ole Opry!!!

So, Sunday is open for family activities until the Exhibits open at 4:00 p.m.!

On Monday, as the Technical and Management sessions open early, the ladies will be scheduled to the WAKING CREW life radio broadcast and breakfast there in the Opryland Hotel galleria. The broadcast is aired a 7:30 each morning over WSM Radio with Ralph Emery as host. This show is reminiscent of some of the early day radio shows, complete with audience participation and special guests. We think you will enjoy this one, and it will give you an opportunity to re-acquaint yourself with friends you have met at CCOS over the past years and make your plans for the other activities during your stay.

Immediately following the Continental Breakfast and radio broadcast, about 9:30 a.m., the ladies will board buses for a trip to the Country Hall of Fame with lunch at the Cannery at 11:30. There will be re-boarding at 1 p.m. for the bus to tour some of the other areas of interest, such as the famous Parthenon, returning to the hotel at approximately 2:00 p.m.

TUESDAY WILL BE COURTESY HBO FOR THE LADIES AND YOUNG PEOPLE!!! Again, HBO has graciously offered to provide entertainment for the ladies by providing a tour to the hamour Hermitage Home, the residence of President Andrew Jackson. This is one of the most beautiful estates in the area, with its extensive landscaping and gardens and is the second most visited presidential home in the United States. I can tell you — it is something to behold! A lunch stop will be made at the Heritage House Smorgasboard, with your arrival back at the hotel in the area of 2:00 p.m. The tour and transportation will be provided by HBO with your lunch and shopping on your own.

To add to the nicety of this day, HBO will take charge of the young people so the mothers can have a free day. HBO will be taking the young people to a unique and interesting recreational water spot, called WAVE COUNTRY. This is a huge pool with simulated ocean waves. The children will need their swim suits and extra money for snacks and perhaps raft rental, but this will be a fun day for them, provided by HBO. Mothers may rest assured that WAVE COUNTRY is fully staffed with registered lifeguards and that the group will be chaperoned.

By planning these tours early in the day and returning the ladies to the hotel early afternoon, there is still ample time left for some activities and sight-seeing on your own. This will give you a chance to rest your feet before the men are dismissed from the sessions at 5 p.m. and before the exhibits open at 7:00 on Monday. Remember that Tuesday, the exhibits are open at 5-7 p.m. prior to the cocktail party preceding the banquet. You'll want to be rested up for this evening's activities — we think it's going to be something special!

We will need to have a count on Monday's tour, so if you are interested in going with the CATA group, please indicate this as you order your Grand Ole Opry tickets and Opryland tickets (don't forget to do this to take advantage of the savings!). Again, these are group rates on the tour, so it is cheaper to make your plans for Monday through us. Also there are other tours offered leaving the hotel daily at 10:00 and 2:00 p.m., and you can make arrangements for those in the hotel lobby. But, we hope you will join the CATA ladies and enjoy all of this with us.

In making these plans, we have tried to choose the most interesting activities in the area, and we think you will be pleased. Arrangements for these tours can be made with me at the Registration Desk, and there will also be a representative from HBO to get the names of those participating in their functions. I do need to know in advance how many of the ladies will be interested in going on Monday and Tuesday, so please drop me a note with your ticket order.

We're looking forward to having you in Nashville with us, and will see you soon.

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The top CATV systems rely on Avantek test equipment. So can you.

Avantek CATV test equipment finds the problems other instruments miss.

When your subscribers are in an uproar or you are doing FCC proofs, nothing is more important than accurate testing. That's why 21 out of the 25 largest CATV systems use Avantek test equipment to pin down hard-to-find problems and make critical measurements with unequalled accuracy.

New! A 440 MHz automatic sweep system and a rugged return link tester.

We've just added the CR/CT 4000, a new automatic sweep system that lets you continuously monitor the performance of up to 58 channels without program interference. You can test your system in prime time if necessary because the CR/CT 4000 sweeps from 5-440 MHz in 25 milliseconds at a level 30 to 35 dB below video.

Our new CT202 Return Link Transmitter measures gain and flatness of the common 5-35 MHz return link. It weighs less than three pounds, including rechargeable battery and built-in charger, and has been designed for years of rugged use.

Avantek precision and ruggedness throughout your system.

Avantek fills your need for accurate testing throughout your system with signal level meters, remote sweep systems, TDR cable analyzers and return link transmitters. Avantek has also created the AR-1000 satellite TVRO receiver which utilizes our unique combined LNA and downconverter. This block downconversion technique saves you space and money while improving your system's picture quality.

Ask for complete details on Avantek CATV test equipment.

If you would like additional information about any Avantek precision test instrument, or other Avantek products, please write Avantek, Inc., 481 Cottonwood Drive, Milpitas, CA 95035. Or call (408) 496-6710, Ext. 2524.

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OPRYLAND SHOWBILL

No visit to Opryland Park would be complete without experiencing some of the entertainment waiting for you at the Opryland Entertainment Complex. Your tickets of admission to the Park includes the shows and regular attractions, as well as all the rides. In fact, there is so much offered, you may want to consider ordering the "Encore" admission tickets which allows two-day admission and represents a tremendous savings. Another saving is to take advantage of the Group Discount which CATA has arranged; complete the form on Page 2 of the Sub-card to order your discount tickets. These Group Discount tickets are $9.75 each for all ages, 4 and above. (Children 3 and under are admitted free.) Encore tickets, for admission two consecutive days, may be purchased for $15.00 each.

As you make your plans for the family to visit, you might want to take advantage of the reduced rates, as well as the consecutive visit tickets for the family after your sessions begin on Monday morning. These tickets will be available at the CATA CCOS registration desk outside Ryman Hall as you pick up your registration packets.

But to get back to the entertainment, you will find a listing of the shows being presented, locations, and times. We would suggest that because of the large assortment, that you look over the list and plan the shows you want to see. A feature of the Opryland Park is to highlight a name entertainer Monday through Thursday at a special showing at 5 and 7 p.m., at no extra charge but you'd probably want to make these shows on Monday or the early one on Tuesday so you wouldn't miss the last night's GALA with Bill Anderson, the "voice" of the Grand Ole Opry.

DON'T FORGET . . . to take advantage of the group rate discount on Opryland Park tickets, order yours today, **as the deadline is June 14th,** using the form on the Sub-card; tickets can be picked up at the registration desk, thus avoiding standing in the long lines to buy your admission tickets once you get to the Park.

OPRYLAND has planned a Fireworks Display for the 4th of July, and it should be spectacular!!!

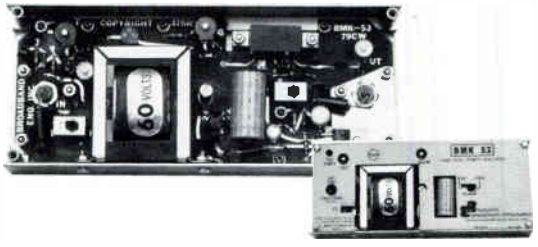
Upgrade your SLE line extenders with push-pull hybrid electronics – Broadband now offers the BMK-53 in ready-to install modules.*

With our BMK-53 now in ready-to-install modules, it's a relatively simple matter to upgrade your Jerrold® SLE-1, 20 2P line extenders to 300 MHz push-pull hybrid electronics. Another cost effective option from Broadband, it features:

- Push-pull hybrid electronics
- 300 MHz – 35 channel capacity
- 30 or 60 volt powering options
- 28 dB gain (standard module)
- 32 dB gain (high gain module)
- Three levels of surge protection
- 12 to 20 dB of equalization at 300 MHz

Pricing as low as $99.50 for more than 50 pieces.

*Also available as a replacement assembly ready to install in your existing module.



For free specification sheets and pricing, call our toll-free number (800-327-6690) or write Broadband Engineering, Inc., P.O. Box 1247, Jupiter, Florida 33458.

BROADBAND™
A SUBSIDIARY OF AUGAT

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OPRYLAND SHOWBILL

Here's a brief description of each of Opryland's exciting shows. Choose your favorites!

"I Hear America Singing"
Don't miss Opryland's longest running show! It's 50 fast-moving colorful minutes of America singing her heart out in good times and bad. You'll hear all the glad songs, the sad songs and the fad songs from the '20s through 1982. And this year it's been moved to a larger theater with some exciting new special effects never seen before, all to bring you the best of America singing her special song.
Sponsored by American Airlines
50 minutes — **Acuff Theater**

"Today's Country Roads"
Eight talented Opryland singers bring you a delightful taste of today's country sound including the popular duets, solos and group members that are currently topping the charts.
Sponsored by Music City News
30 minutes — **Gaslight Theater**

"Rockin' Around the Clock"
Pull on your poodle skirt, slick back your hair and grab your blue suede shoes — the Sh-Booms are revving up with a fistful of fifties favorites from that rockin' and rollin' decade! This is a musical salute to the days of Edsel and Elvis with plenty of goofin' off in between to keep you wondering what's going to happen next!
Sponsored by Music Man, Inc.
25 minutes — **Juke Box Theater**

"Country and Bluegrass Show"
Fast-fingered fiddlin' and banjo pickin', lighthearted singin' and plenty of homespun humor performed from the front porch of a mountain cabin — this is country and bluegrass the way it should be heard!
Sponsored by the C.F. Martin Guitar Organisation
25 minutes — **Country and Bluegrass Theater**

"Sing the Glory Down"
Opryland's own gospel quartet, The Cumberland Boys, combines the great gospel sounds of the past with the beat of the new, including music from the great gospel groups, such as the Blackwood Brothers, the Kingsmen, the Statesmen Quartet and the Oak Ridge Boys.
25 minutes — **New Orleans Bandstand**

"For Me and My Gal"
Hats off to America at the turn-of-the-century and some of her riproaringest years! A long-time Opryland favorite, "For Me and My Gal" has been moved to a new theater and has been changed to bring you more dazzling costumes, more stirring songs and more elaborate scenery than ever before. It's an exciting new look for a real Yankee Doodle Dandy!
40 minutes — **American Music Theater**

"Tennessee River Boys"
Here are three fellows who make country music three times better! They sing today's popular country hits with a precise harmony and rhythm that will have your heart beating in time to their show-stopping sound.
25 minutes — **Flipside Theater**

"Os and Charlie"
Bashful Brother Oswald and Charlie Collins, two of Roy Acuff's "Smoky Mountain Boys," dish our their special brand of music and fun. This is the homespun country music and humor that kept the porches of rural America alive for decades. And who knows, Roy himself might show up!
20 minutes

"That's Grand Ole Opry"
An audio-visual presentation featuring the great stars of the Grand Ole Opry's first half-century.
Sponsored by the National Life and Accident Insurance Company in the National Life Hospitality Center.
25 minutes
Every half-hour (except when Os & Charlie are performing)
National Life Hospitality Center

"Country Music U.S.A."
Here's one of the biggest shows and the most widely-traveled — it's toured the Soviet Union and has played a command performance at the White House. You'll feel the country in your soul with its toe-tappin' combination of country hits both past and present that traces country music from its beginnings to its popularity today. If you're a country music fan, you'll love it. If you're not, you'll wonder what took so long!
Sponsored by Martha White Foods
45 minutes — **Theater-by-the-Lake**

"Showboat 1982"
Here comes the showboat! Picture yourself on the banks of Old Man River on Opryland's Showboat Theater as the Cotton Blossom pulls alongside to bring you a cargo of colorfully-costumed singers and dancers bursting out on shore to entertain you with a lively blend of riverboat jazz and minstrel music. It's a grand show that would bring ole Mark Twain himself to his feet applauding!
Sponsored by the Coca Cola Company
35 minutes — **Showboat Theater**

Big "G" Laughin' Place
With a lot of magic and a little buffoonery, this show is a treat for kids of all ages . . . but especially the small fry.
Sponsored by the Big "G" Cereal Division of General Mills
15 minutes — **Kid Stuff Theater**

General Information

Breakfast is served in the Plaza Cafeteria until 11 a.m.

Out passes and rain checks: Visitors may leave the park and return the same day without additional charge after having their hands stamped at the front turnstiles before they leave. Sorry no rain checks or refunds will be issued.

First Aid: An emergency medical technician is on duty at the First Aid Station, located in Do Wah Diddy City near the Sky Ride. If you need medical assistance, alert one of the park hosts, hostesses or rangers. NOTE: Oral medications are not dispensed at the First Aid Station. Non-prescription drugs may be purchased in selected gift shops.

Lost People: If you are separated from a companion or a child, go to the "Lost People" facility in Do Wah Diddy City, next to the Sky Ride.

Messages: Since routine announcements are not made in the park, there is a message board in the National Life and Accident Insurance Company Hospitality Center if you need to leave a message for someone inside the park.

Lost and Found: Check with Guest Relations for lost and found articles.

Car Trouble: If you have a car problem, raise your hood and ask a ranger for assistance.

Alcohol: NO alcoholic beverages are allowed in the park or in the Opry House.

Dress: All Opryland visitors must wear shoes and shirts. No bathing suits allowed!

Kennel: All day care, food and water, $1.

Postal and photo services: Available in the Opry Plaza Area.

Lockers: Outside the main gate and in the Opry Plaza behind the Plaza Gift Shop.

Wheelchairs and strollers: Rentals at the park entrance.

Diaper changing facilities: Inside the park at various locations. □

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CCOS '82

SCHEDULE OF EVENTS

SATURDAY, JULY 3RD

1:00 - 5:00 p.m.	Registration	Ryman Hall
4:00 - 6:30 p.m.	Exhibits Open	Ryman Hall
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 Opryland	
9:30 p.m.	Grand Ole Opry	Opry House

SUNDAY, JULY 4TH

10:00 a.m.	Opryland Theme Park opens Celebrate the 4th!	
1:00 - 4:00 p.m.	Registration	Ryman Hall
4:00 - 7:00 p.m.	Exhibits Open	Ryman Hall
6:00 - 7:00 p.m.	Exhibitors Host Cocktail Party	Ryman Hall
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"	Johnson
10:00 - 11:30 a.m.	"Surely Insured"	Johnson
2:30 - 5:00 p.m.	"Open Forum - Refranchising "	Cherokee

TECHNICAL SESSIONS

9:00 - 11:30 a.m.	"What Is A Cable System"	Cumberland
9:00 - 11:30 a.m.	"Let's Analyze the Situation"*	Judges' Parlor
2:30 - 5:00 p.m.	"Big Bucks In A Small Town"	Commodore
2:30 - 5:00 p.m.	"Let's Analyze the Situation"*	Judges' Parlor

EXHIBIT HOURS

12:00 - 2:00 p.m.
7:00 - 9:00 p.m.

TUESDAY, JULY 6TH

MANAGEMENT SESSIONS

9:00 - 10:00 a.m.	"Advertising on Cable Pays"	Johnson
10:00 - 11:30 a.m.	"Ad Spots on Satellite Programming"	Johnson
2:30 - 5:00 p.m.	"Dungeons and Dragons — The Copyright Monster Breathes Fire Again"	Johnson
2:30 - 3:45 p.m.	"Equipment and Interface"	Cherokee
4:00 - 5:00 p.m.	"Can We Afford To Finance Rebuilds and System Upgrading?"	Cherokee

TECHNICAL SESSIONS

9:00 - 11:30 a.m.	"What Will Two or Three Degree Satellite Spacing Do To Your TVRO Reception?"	Natchez Trace
9:00 - 11:30 a.m.	"Let s Analyze the Situation"*	Judges' Parlor
2:30 - 5:00 p.m.	"Keep That System Equipment Operating Properly"	Cherokee

EXHIBIT HOURS

12:00 - 2:00 p.m.
5:00 - 7:00 p.m.

TUESDAY IS HBO DAY!!! The ladies and young people registered at CCOS will be entertained by special events planned and by courtesy of HBO

7:00 - 8:00 p.m.	Cocktail Party sponsored by Warner Amex	Nashville Lobby
8:00 - 9:00 p.m.	Banquet	
9:00 p.m.	Entertainment sponsored by Group W Satellite Communications which brings you THE NASHVILLE NETWORK, SATELLITE NEWS CHANNELS, and THE DISNEY CHANNEL.	

*This session will have limited attendance; please register for your space in this session immediately. Contact the Oklahoma City office (405) 947-7664 for space reservation.

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Cable Television's Greatest Potential Killer

Don't Overlook The Warning Signs!

Sounds like the type of medical bulletin that might be issued by the Surgeon General to try to make people aware of imminent dangers to their health. The strange thing about people is the complacency toward these danger signals and warnings — perhaps because there are so many of them, or because we just do not believe anything can happen until it is too late.

What is this "Killer" that may prove to be the greatest danger for cable television? Is it something new that is about to descend upon our industry with disastrous impact like so many of the others — **copyright, syndicated exclusivity, "must carry rules", non-duplication protection, etc.?**

Our "Killer" is not a new disease for cable television. It has been with us for many years, and, about eighteen months ago, it received a lot of publicity and created a tremendous amount of panic among cable operators. Yet today, it seems to have been relegated back to an item of lesser importance because we have so many other problems to worry about. This dangerous and destructive item that I am talking about is . . . **Signal Leakage (see "What's In a Word? More Than You Think", CATJ August 1981).**

Is there really a need to raise this issue **again** and **again** now that everyone has been warned about clearing the channels in the restricted frequency bands as required by the FCC Rules, Part 76.610? The answer is an emphatic **YES!** The other issues that currently form the battleground for the cable industry are certainly important and must not be cast aside, but signal leakage is potentially a more disastrous problem in the long run than all of the others combined.

Take a moment to consider the possible consequences if there are many more incidents such as the Flint, Michigan, case where cable system signal leakage interferes with aeronautical frequencies, and, in particular, if such an incident becomes a part of an aircraft accident investigation. What could happen then to 400MHz technology — or even 300MHz technology or less? Would we eventually be restricted from using these frequencies **entirely,** leaving us with only 26 channels for operation? That thought alone is **horrifying,** but it is only a part of the problem.

The February 1982 issue of **QST,** a publication of the American Radio Relay League, Inc. (AARC), has several articles and editorial comments about a subject called CATV I (Cable Television Interference). Page after page of this issue is devoted to this "new strain of RFI virus" and how cable television systems are infringing on the rights of radio amateurs through neglect and irresponsibility. Included in the articles was that portion of the FCC Rules, Part 76, Subpart K, Sections 76.605, 76.609, and 76.613, along with a recommended procedure of what the amateur radio operator should do if he experiences CATV I.

Specific frequency areas of CATV I were pointed out such as cable channel E in the 2 meter band, channels J and K in the 220-225MHz band, and channels UU, VV, WW, XX, and YY in the 432-450MHz band. In addition, there is growing concern in AARL about the increasing number of two-way cable systems whose up-stream channel useage (Sub Band Channels T-7 through T-13) will cause further problems in the amateur frequencies from 7 to 28MHz.

How serious is the situation at this point? AARL has filed comments in opposition to the FCC proposal to relax leakage standards for cable television systems in Docket 21006. Additionally, requesting **removal of cable television operation from amateur frequencies** will be filed with the FCC in the near future. Could this mean we might be restricted to 16 channels at some point in time?

Suppose that the people using meteorology satellite frequencies and space operations get on the band wagon with the Civil Air Patrol to restrict Channel D? And let's not forget the Land Mobile group who could wipe out F,G,H, and I for us. **Surprise friends!! We are back to 12 channels of operation.**

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Frequencies	Signal Leakage Limit (microvolts per meter)	Distance (feet)
0 through 54MHz	15	100
54MHz through 216MHz	20	10
Above 216MHz	15	100

It is true that all of this has been taken to extremes, but **it could happen.** Unlike the many political issues facing cable television today, this "Killer" is our own fault. It is a technological problem **and** it has a technical solution. We can prevent signal leakage from becoming the one item that could toll the death knell for cable, but it will require the absolute cooperation of everyone in this industry in strict self-regulation of signal leakage.

NOW, ABOUT SOLVING THOSE LEAKS . . .

CATV systems are normally composed of coaxial cable that has a continuous external sheath that is physically connected to well shielded active and passive devices to provide maximum isolation from the signals present in the electro-magnetic spectrum. Perfect shielded integrity is almost impossible to attain throughout the entire cable plant even when the cable system has just been built by highly qualified cable construction personnel who performed their job with extreme care. One must also consider that such a newly constructed cable system would be at its very best and will only deteriorate from that point. Therefore, CATV systems will always have a certain amount of signal leakage from the signals carried on the system without having any apparent visible effects upon the normal operation of the system. The amplitude levels of signal leakage from a well shielded CATV system are very small and do not cause any serious problems. Eventually, several things will happen to a cable system such as cuts in the cable, poor connector replacement, etc., that will result in serious faults in the system's shielded integrity, and these faults **may** or **may not** be visibly apparent in the normal operation of the cable system. Where these faults cause noticeable deterioration of the cable system signals, we would expect that they would be found and corrected immediately to keep the subscribers happy. However, when these problem areas do not cause system operational problems, we encounter a situation where the cable system is leaking the signals carried into free space.

The FCC has established certain levels at which signal leakage is no longer acceptable. Part 76.605(a) (12) of the rules specifies that a cable system may not exceed these levels as follows:

There are several reasons why it is in the best interest for cable operators to correct any signal leakeage problem that comes close to or exceeds the FCC limits. First, there will always be those residents who can pick up your cable signals without paying you for the service. Most important of all, however, is the fact that signal leakage that exceeds the FCC established limits will cause RFI (radio frequency interference).

This RFI will not only affect non-cable residents who watch television by off-the-air reception, it may also interfere with aeronautical frequencies, land mobile radio frequencies, ham radio frequencies, etc. Frequently, the areas that are the cause of signal leakage in a cable system are an entry point for moisture which, if left uncorrected, will cause serious damage to the cable system. Another reason to correct these cable faults is that where you have serious **signal egress** (leakage out of the cable system), you will also experience **signal ingress** (undesired signals getting into the cable system) — the most common of which is **CB radio.**

There are many causes for the loss of shielding integrity in a cable system. The most common of these are:

1. Unterminated taps.
2. Poorly installed connectors.
3. Loose cable fittings.
4. Physical damage to the cable (kinks, cuts, holes).
5. Failure of "F" connectors to make proper contact with cable shield (usually caused by using a cheap, bargain connector).
6. Radial cracks at cable expansion loops.

Now that we have defined the problem and its causes, what is the cure? A cable system must establish a signal leakage detection and correction program. This program has to be a continuous, ongoing preventive maintenance schedule that incompasses every area of the cable plant. The best method to accomplish this is through the use of a signal leakage detector such as a Cuckoo, Sniffer, or Blood Hound. The RF Leakage detectors have a signal transmission source that is interfaced into the cable system at the headend and receivers that should be installed in your company vehicles.

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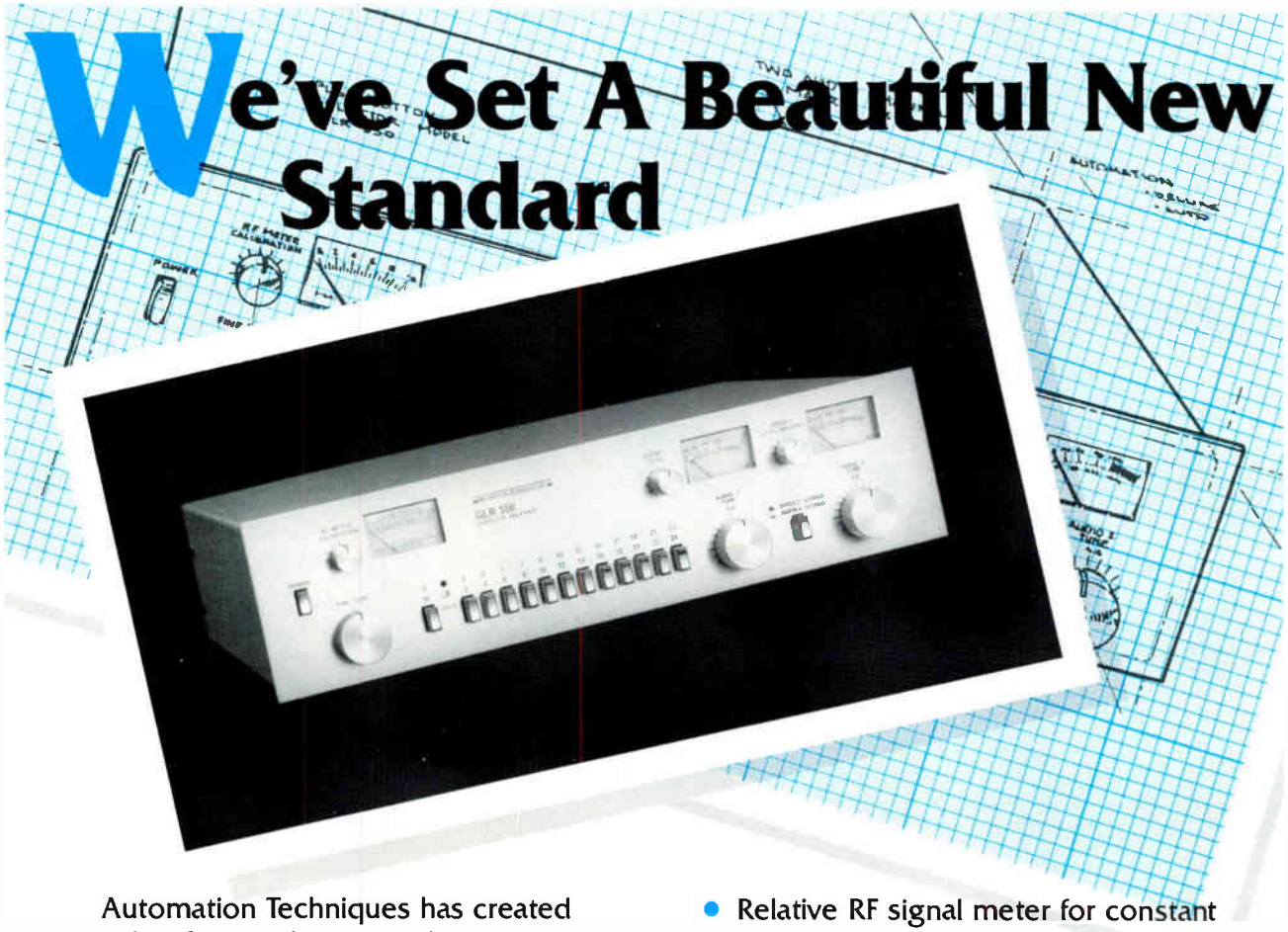

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GENERAL PURPOSE BANDSTOP FILTERS

EDITOR'S NOTE: From the response we have had to Glyn Bostick's previous filter articles showing how to recognize the need for a particular filter and apply it to eliminate interference, the need for a Cable Tech to "cut" a filter on the spot arose, being able to design it with simple calculations, and make it fast of standard parts. Mr. Bostick agreed and volunteered to write a series of general purpose, easy to make designs including BANDSTOP, BANDPASS, LOW-PASS and HIGH-PASS filters and combinations of these. Here is the first of the series . . .

By: Glyn Bostick
Richard Martin
Microwave Filter Company, Inc.

General Cookbook Note

The cookbook designs are selected for their general purpose applicability and quick construction, using easy-to-get parts. Explicit theory is avoided and is implicit in the simple formulas for circuit elements. Each design will be presented in "stand alone" form — no need to go to any other technical references.

Application

You want to suppress a part of the VHF spectrum (5-300MHz) and leave the remainder undisturbed.

This 5-branch design provides 40db suppression over your selected stopband (SB) = (F_3 - F_2). The 3db bandwidth will be about twice as wide as the stopband (SB). This design can be put together with readily available ceramic disk capacitors and hand-wound coil inductors.

Design Procedure

1. Decide on the 40db stopband (SB):
   (SB) = (F_3 - F_2)MHZ
2. Compute the center frequency (F_0) from **Figure 1.**

Power Passing part one

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3. If you wish to locate the 3db frequencies precisely, F_1 and F_4, calculate them from **Figure 1.**

4. Using the formulas of **Figure 1,** compute the values of the capacitors (Pfd) and inductors (micro-henries).

5. Selecting Capacitors - see standard capacitor values **(Figure 1).** If calculated values are non-standard (within 5%), parallel two (or more) standard values which add up to the correct value.

CAUTION: See **Figure 1.** Find the (SB) corresponding to **your** F_0. If **your** (SB) is smaller than this, make the leads of C_2 and C_4 as short as possible to minimize the lead inductance. Better yet, **also** parallel two or more capacitors to **further** decrease lad inductance.

6. Coil Inductors - see **Figure 1** and calculate the number of turns for each coil. Round **up** turns to the nearest **half-turn.**

7. Branch Pre-Tuning ("Pruning") - to assure easy tuning of the complete BSF, each branch (coil with associated capacitor) should be mounted (alone) on the proposed circuit board and its coil adjusted or modified to resonate the branch at F_0. For example, if the initial resonance is, for instance, 10% high in fre-

cont. on P. 48

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CATA SIGNAL LEAKAGE LOG

DATE FOUND	LOCATION	LEVEL	at FREQ.	PROBABLE CAUSE	CORRECTED DATE
12-9-81	Lot 32 A. BIG PINES, T.P.	-43 dBuV	107.0	unterminated Tap	12-13-81
1-14-82	Main at Cypress	-44dBuV	107.0	Bad Splice	1-21-82
1-27-82	218 Washington	-41dBuV	107.0	CRACKS in cable	1-29-82
2-11-82	Behind City Bank	-34dBmV	107.0	cut cable	2-11-82
3-12-82	Oak and 21st St.				

Many cable systems use these RF leakage detector devices using the signal transmitter and FM radio receivers in their trucks. The problem with this method is that the system technicians are not going to tune in the vehicle FM radio to the leakage detector frequency when they can listen to their favorite music station. Obviously, the use of the designed equipment receiver, even though more expensive than an FM radio, is the solution to this problem. The second problem is how to get your personnel to turn on the RF leakage receiver in their vehicles. There are two excellent ways to deal with this.

First, install a receiver in every vehicle with the power on-off switch hard wired for continuous power on and connect the power input leads so that the unit is activated whenever the vehicle ignition switch is on. The second step is to encourage every employee to try actively to detect areas in the cable plant where signal leakage is occuring by offering bounty for every one reported and verified. This has proven to be quite successful in those few cable systems that have established this bounty program and involves everyone since even the office personnel will participate by using their own FM radios tuned to the detection frequency, even when they are not on duty, or driving to and from work. One

ECONOMY
450 MHz

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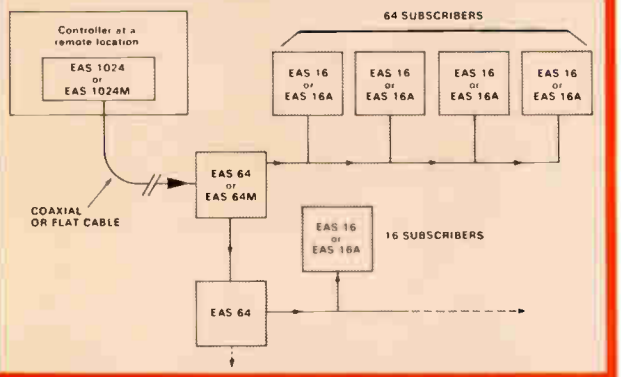
ADDRESSABLE SYSTEM



EAS The above system is composed of 3 units — a microprocessor control (EAS-1024); a decoder (EAS-64); and a wide-band, multitap switch assembly (EAS-16). The system can be installed in 2 alternative configurations and is most compatible with other systems.
Illustrated folder with specifications upon request.

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ment of signal leakage you will need a telescopic dipole antenna, a low noise pre-amplifier, and a good Field Strength Meter that has at least a −30dBmV scale sensitivity.

The first step is to select the frequencies that you wish to measure. Because the level of the signal leakage is extremely low even by the FCC limitations, (i.e. 20 microvolts per meter translates to a level of about −36dBmV at channel 2 and −46dBmV at channel 13), you may encounter interference that produces false readings from the large number of signals in the spectrum such as TV stations, air traffic control, land radio mobile, commercial radio, amateur radio, etc. Therefore, you should attempt to use at least three cable frequencies — low, mid, and high in your operating band —that do not have a high off-the-air signal level at your location within .5 MHz of the desired measurement frequency.

Suppose you have a twenty channel system using low band, mid-band, and high band channels, and there is no perceptable off-the-air interference at 55.25MHz, 211.25MHz, and 145.2MHz . . . to measure the signal leakage level you will have to use the formula:

$$\text{Length (in Inches)} = \frac{5904}{\text{Frequency in MHz}}$$

Where 5904 is the length in inches of a half wave length in free space. If you were to build your own dipole antenna, the formula would be:

$$\frac{5904 \times K}{\text{Frequency in MHz}}$$

where K is a function of the rod diameter to adjust from free space. The K for RD-1 is .95. Therefore, to figure the length in inches for the video carrier of channel 2:

$$L = \frac{5904 \times .95}{55.25} \text{ or } 101.51674 \text{ inches}$$

You may round off the distance to the nearest 1/100 of an inch, and the dipole length from tip-to-tip would be 101.52 inches.

Next you will have to connect the dipole output to a low noise pre-amplifier having a known gain of at least 20dB. Connect the output of the pre-amp to the RF input jack on your field strength meter. Place the dipole so that the distance between the center of the dipole and the system components is 10 feet directly above or below the dipole. Rotate the horizontal dipole around its' vertical axis and record the maximum reading on the FSM at the video carrier frequency.

To convert the FSM reading in dBmV to microvolts per meter we must use two fomulas: Supposing that our FSM read −32dBmV on channel 2, to convert dBmV to millivolts the formula is:

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$$\text{Millivolts} = \text{inverse log } \frac{\text{dBmV}}{20}$$

$$\text{mV} = \text{inv. log } \frac{-32}{20} = \text{inv. log } -1.6$$

mV = .02511886 or 25.11886 μV (microvolts)
To find the number of microvolts per meter, use the formula:
μ/M = .021 X uV X F(MHz)
or
μ/M = .021 X 25.11886 X 55.25 = 29.144157
which exceeds the FCC limitations. If our FSM reading was −49dBmV, the measurement at channel 13 video carrier would be 15.74 μV/m.

One important factor to keep in mind is that the requirements of Part 76.609(h), the measurement procedures for signal leakage as specified by the FCC, are difficult to accomplish. Off-the-air interference is not the only problem that may affect the accuracy of your measurements. System leaks are caused by mechanical faults in a cable system, and these faults act like a mismatched broadband antenna. This mismatch may cause leakage patterns having large standing waves on the cable sheath and strand, resulting in signals at a considerable distance from the point of the fault. Signal leakage may also be retransmitted by guy wires and ground wires making it difficult to make a precise level reading since the measuring antenna can be receiving the signal from several different points.

One point that many cable technicians fail to consider is that signal leakage is usually multi-point radiation of signals into the atmosphere from numerous mechanical fault locations throughout the entire cable system. This means that the signal leakage has a greater EIRP than that of single point radiation, often referred to as "dome effect". This additive dome effect would have a signal leakage level at its peak well above 20 μV/m even though every single fault location may fall slightly below the 20 μV/m level. Therefore, it is recommended that cable systems try to maintain individual signal leakage faults about 20dB below the FCC minimum standards. Most leakage detector equipment will respond to signals in this level area.

Most important of all is to understand that an effective and on-going signal leakage detection and correction program is highly cost effective in cable systems. It locates and corrects system faults before they become expensive repairs or cause signal deterioration or outages, and insures compliance with the FCC rules and regulation, possibly avoiding expensive fines. Most important of all, if everyone in the industry will actively support a signal leakage detections and correction program in every cable system, then we will not have to worry about losing any of the existing or future additions of frequencies in the CATV spectrum.

cont on P. 46

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CATA SIGNAL LEAKAGE LOG

DATE FOUND	LOCATION	LEVEL	at FREQ.	PROBABLE CAUSE	CORRECTED DATE

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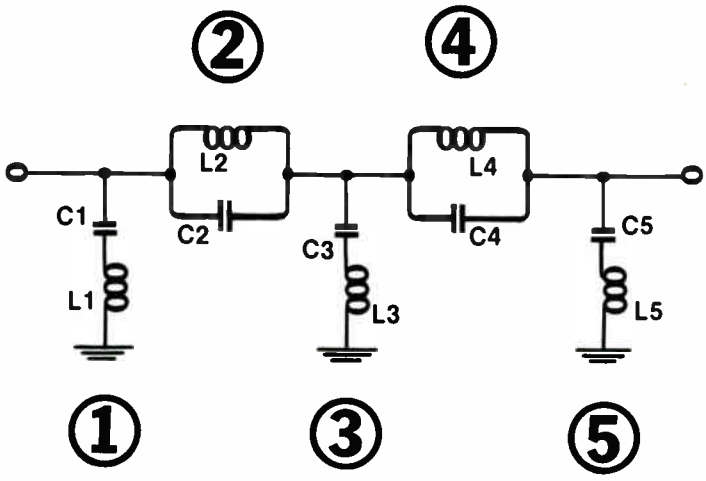
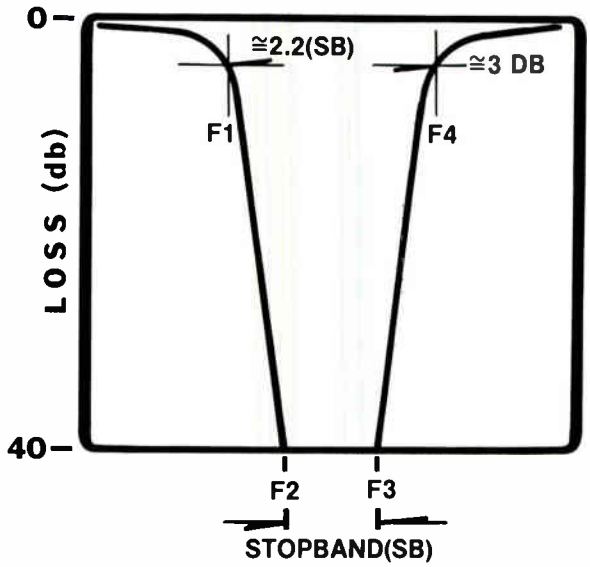




CENTER FREQUENCY $F_0 = \sqrt{F2 \times F3}$

STOPBAND (SB) = (F3−F2)

$F1 = \sqrt{1.21(SB)^2 + F_0^2} - 1.1(SB)$

F4 = F1 + 2.2(SB)

L1 = L5 = 4.73/(SB)

L3 = 2.75/(SB)

C2 = C4 = 7 03/(SB)

FREQUENCY IN MHz

C in Pfd
L in μh

$$C1 = C5 = \left[\frac{159.15}{F_0}\right]^2 / L1$$

$$C3 = \left[\frac{159.15}{F_0}\right]^2 / L3$$

$$L2 = L4 = \left[\frac{1.59.15}{F_0}\right]^2 / C2$$

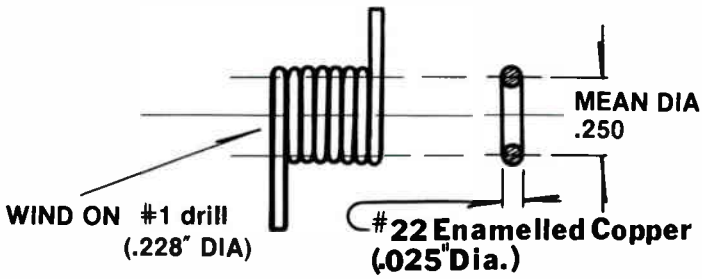
FOR EASY TUNING:

$(SB) < .00222(F_0)^2$
If your stopband is less, take precautions to minimize lead inductance for C2 and C4

STANDARD CAPACITANCE VALUES

Primary standard values are:

1.0	2.7	5.0	MULTIPLY THESE BY 10, 100, etc. AND GET OTHER STANDARD VALUES
1.2	3.0	5.6	
1.5	3.3	6.8	
1.8	3.9	7.5	
2.2	4.7	8.2	



$TURNS = 8L + \sqrt{(8L)^2 + 72L}$

FIGURE 1
DESIGN OF 5-BRANCH 75-OHM BANDSTOP FILTER

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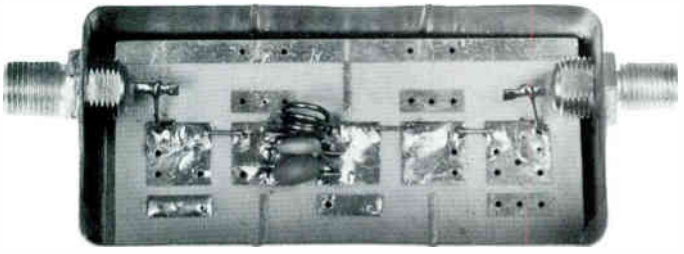
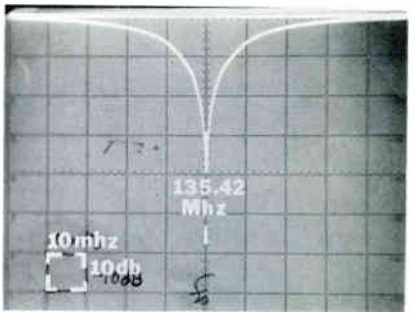
FIGURE 2

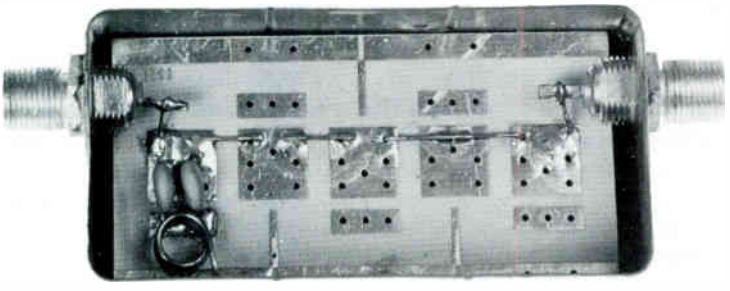
TEST MOCK-UP OF SERIES BRANCH

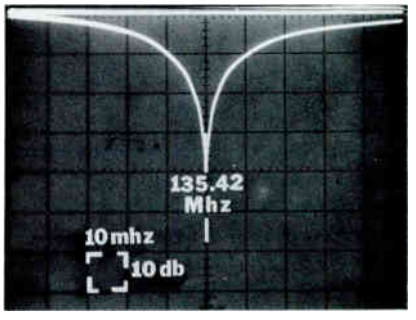


SWEEP OF SERIES BRANCH



BRANCH TEST WIRING AND SWEEP RESULTS





TEST MOCK-UP OF SHUNT BRANCH

SWEEP OF SHUNT BRANCH

quency, reduce the coil turns by 10%, and so on.

8. Complete Filter Tuning - after an individual branch "pruning", the complete BSF is assembled and tuned. Using a spectrum analyzer or equivalent, F_1, F_2, F_3, and F_4 is marked on the screen. Branch coils are then "tweeked" in rotation (from input to output) to produce a symmetrical notch pattern passing through or near these four frequencies.

Design Example

1. Design a BSF to give 40db attenuation from channel A video (121.25 MHz) to channel E video (151.25 MHz):
   F_2 = 121.25 MHz
   F_3 = 151.25 MHz

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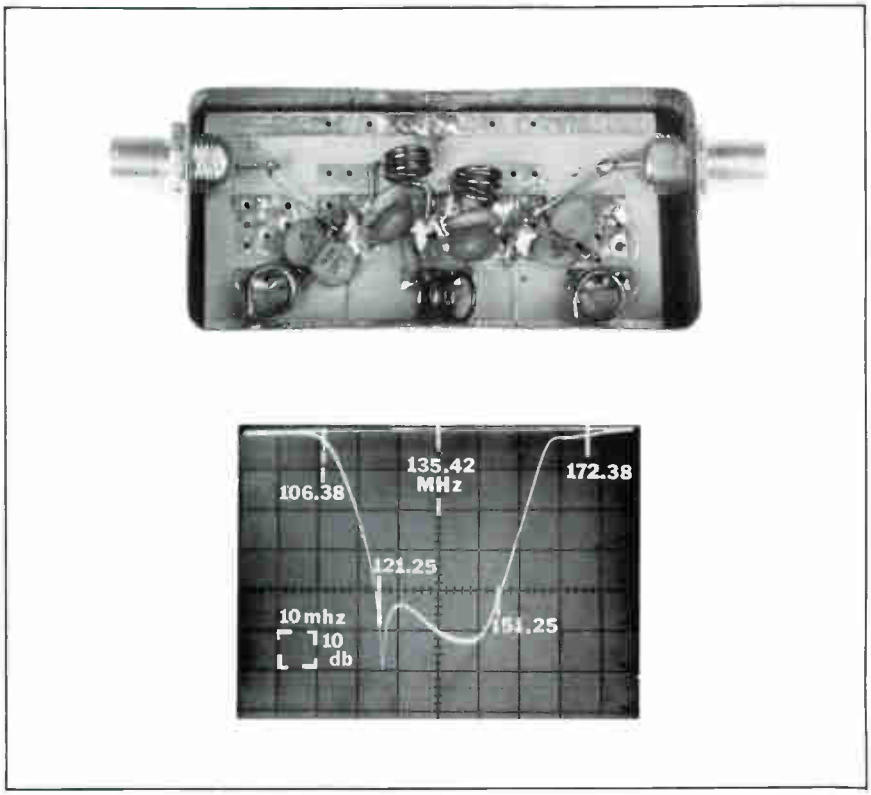
FIGURE 3



WIRED CIRCUIT AND FINAL RESPONSE OF BSF DESIGNED IN THE EXAMPLE

Stopband (SB) = $F_3 - F_2$ = 30 MHz

2. From **Figure 1**, center frequency F_0 = 135.42 MHz

3. From **Figure 1** we compute the 3db frequencies:
   F_1 = 106.38 MHz
   F_4 = 172.38 MHz

4. Using the formulas of **Figure 1:**

Inductors	Capacitors
L_1 = 0.158 uh	C_1 = 8.74 Pfd
L_2 = 0.059 uh	C_2 = 23.43 Pfd
L_3 = 0.092 uh	C_3 = 15.01 Pfd
L_4 = 0.059 uh	C_4 = 23.43 Pfd
L_5 = 0.158 uh	C_5 = 8.74 Pfd

5. **Capacitor Selection**
   Referring to **Figure 1,** we see that our F_0 of 135.42 corresponds to a stopband of 40.8 MHz. **Our** (SB) is 30 MHz, smaller than this. So we are going to use two capacitors in parallel and trim for very short leads for C_2 and C_4. (We are also going to use two capacitors in parallel for the other branches in order to get very close to our computed values.)

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Impressive quality . . . surprisingly low price. Just $3295 for the most reliable unit available (at any price!).

We have been in the cable television business for 23 years . . . and providing weather information systems for the past 16 years. We know what you need and we know how to manufacture it. For reliability and performance.

The Weather Scan III comes complete with Sony AVC-1400 camera with separate mesh vidicon and 2:1 interlace sync. Includes Time, Temperature, Barometric Pressure, Wind Velocity, Wind Direction, plus four card holders. Compact cabinet is just 28" wide, 23" deep and 14" high. For complete information call or write.

Weather Scan, Inc.
An R.H. Tyler Enterprise
Loop 132 and Throckmorton Hwy. Olney, Texas 76374 Ph. 817-564-5688

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Final Selection

Capacitor #	Value Computed	Standard Capacitors	Total Value
C_1	8.74 Pfd	1.8 + 6.8	8.60
C_2	23.43 Pfd	22. + 1.5	23.50
C_3	15.01 Pfd	6.8 + 8.2	15.00
C_4	23.43 Pfd	22. + 1.5	23.50
C_5	8.74 Pfd	1.8 + 6.8	8.60

6. **Coil Inductor Turns**
We obtain turns needed by inserting L (uh) in the formula of **Figure 1.** We round **up** to nearest half-turn. (We can always stretch the coil to slightly reduce the inductance value. Half turns will fit our circuit board wiring better than fractional turns.)

Coil #	Value	Turns
L_1	0.158 uh	5.0
L_2	0.059 uh	3.0
L_3	0.092 uh	3.5
L_4	0.059 uh	3.0
L_5	0.158 uh	5.0

7. **Pre-Tuning of Branches ("Pruning")**
We now place each shunt branch alone, at its intended final position, on our chosen circuit board to make sure we can "tweek" the coil to get branch resonance at F_0 = 135.42 MHz. Since the circuit is symmetrical, we do this only with branches 1 and 3.
Then we do the same with **one** of the (identical) series branches, making sure we place it in series — its final position in the circuit.

After "pruning", coil turns are:

Coil #	Final Turns
L_1	5½
L_2	3
L_3	4
L_4	3
L_5	5½

8. **Complete BSF Tuning**
We now wire the complete BSF and sweep it on an analyzer. First we mark the scope face to locate F_1, F_2, F_3 and F_4 (106.38, 121.35, 151.25 and 172.38 MHz). Then we tune the filter by "tweeking" the coils in turn (input to output) until we get the shape "staked out" by our four marker frequencies.

Part #2 of this series will concern the design of general purpose cable LOW-PASS filters, useful for seperating one broad segment of the VHF spectrum from another. For example, they can be used to pass lo-VHF (channels 2-6) and stop Hi-VHF (channels 7 and up).

***Acknowledgements:** Preparation of this material is a complicated one, and achieved only through the help of some other people to whom I want to say "thanks" — John Greatrex for the line art, and Keith Ernst for the typeset legends, and my clerical assistance for preparation of the copy.*

Gly Bostick □

CATV indoor distribution amplifiers from Blonder-Tongue

Backed by more than 30 years of technical and manufacturing experience, Blonder-Tongue sets a standard of quality in the industry that's hard to beat. These DA series amplifiers are no exception.

DA-30
Wideband
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- Flat Response - 50-300 MHz
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- Exceptionally High Output

DA-21
CATV
Distribution Amplifier
- Ideal CATV Distribution Amplifier in Small Apartment Buildings

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THE NCTA

This is not going to be one of your traditional "round-up" articles about a convention. The NCTA show is no longer a traditional convention — it is a happening. Instead of reporting on all the equipment manufacturers on the exhibit floor, or what who said at which panel, it might be of some help to those of you who were not at the show to get a better "feel" of what went on in Las Vegas at the beginning of May. I should admit right from the start that this "journal" comes with a built-in bias, after all, I am the Executive Director of CATA. But in this case CATA and NCTA can rejoice in their differences, for our conventions clearly serve different purposes. As to the NCTA Show, it was truly amazing, and very well done. The NCTA, its President Tom Wheeler, and his staff should be congratulated — there has never been anything quite like it in the cable industry before.

The fact that there was a cable convention going on in Las Vegas became very clear to any visitor to that city long before getting to any hotels, meeting rooms, or exhibit areas. The main roads leading to town from the airport were littered with billboards, all of them shouting "CABLE"! There was an automated Ted Turner billboard, and seemingly dozens of HBO/Cinemax/USA red and white billboards. Showtime and all the others were up there in lights too — most of the signs telling their readers to visit booth number so and so at "The Show". The billboards, I found out later, all cost thousands of dollars. The question, of course, is *why* that money was spent? Does ESPN (or Showtime, or HBO, or Turner, or anyone else who splashed their name on one of those affronts to nature) really think that the folks in the cable business going to the NCTA show did not know either what ESPN, etc. was, or that they could be found on the exhibit floor? An awful lot of money was spent to state the obvious. As my cabbie said in response to my question of what he thought about it all; "*those billboards are really for the corporate executives of the companies that buy them — they love seeing their name in lights!*". An expensive ego trip. His next question, by the way, and the only other thing he knew about the cable industry was ". . . why does HBO repeat their movies so many times?". In defense of HBO and all the other pay suppliers, I proceeded to explain the problem we have of not enough good film material being available. For the cost of one of those billboards, the big companies might want to look into designing a little pamphlet to explain the situation to their subscribers in a good light, rather than simply put their name up in lights.

I was not surprised to learn that the "expensive ego trip" was just beginning. We passed by the Las Vegas Convention Center on the way to my hotel. There, covering about one-fifth of the circular

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SHOW"

Steve Effros
Executive Director, CATA

A PERSONAL JOURNAL

roof was a pie-shaped wedge of material proclaiming *"NCTA — CABLE '82"*. I have not been able to get anyone to tell me how much THAT cost, but I was informed that it was one of the first times any group had done it in Las Vegas.

I won't bore you with all the details, some of the accompanying pictures will tell the story — huge signs everywhere, lots of glitter, hot air balloons for the opening ceremony and a marching band to boot. Once again we were treated to multimedia shows when it came time for the major speeches, including words flashing on twenty-foot screens set up behind the speaker, and the screens (there were a whole bunch of them) separated by little flashing lights. There were even improvosational skits separating the speakers! It almost got to the point where the delivery seemed to be far more important to the Show planners than the message. That, thankfully, did not happen — but only because the messages that were delivered were so strong. Tom Wheeler's opening address, as well as the one from out-going Chairman Al Gilliland, really did set the stage for the rest of the convention, and what they said was truly important.

If there was any single thread that wound its way through this meeting, it was that cable is now facing competition — competition from various other delivery services as well as potentially predatory competition from AT&T. Those are important subjects to be talked about, and they were, at length. That fact made this a worthwhile show. The message, however, had to compete with the "roar of the crowd". And in this case that "crowd" was the largest ever — almost 16,500 people registered. Now it is not clear who the heck all those people were, but, they were certainly not cable operators!

To be sure there were close to 500 press badges walking around, and a vast majority of the people at the Show where there trying to sell something to someone else. There were plenty of "Guests" too, including dozens of Congressmen and Senators and at least one "rival" Association Executive — me! Thanks NCTA! Exhibitors and Exhibits were everywhere. The Exhibit floor was awesome — 140,000 square feet of it, all filled with booths and people. Unfortunately, the only part of the floor that was not carpeted was where people had to walk, in the aisles, so you could get pretty footweary trying to take it all in. But if that is the biggest complaint about the execution of the Show, you have to admit it was one heck of an event!

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The Show, of course, is put on each year for one primary reason: to make money. And that, I understand it did quite well. The exhibit floor alone, I was told, sold for about 1.6 million dollars. Now I don't know how much it cost, but you can bet there was a healthy profit margin. And that's not even counting all the registration revenue! Sure, the signs, video extravaganzas, and hoopla cost plenty, but word has it that one could only define the show as a success when considering its major purpose.

What else was this show for? Well, of course in the past, cable conventions were a time when cable operators got together and talked to each other about what was going on in the business. The Show no longer really serves that function. Instead, it has been designed as a "showplace" to try to tell the rest of the world where we think cable is going. It is partly hype and partly a mixture of Barnum and Bailey and heavy-duty politics. If the dozens of Congressmen and Senators who were at the show really think all that stuff they saw on the exhibit floor is what cable is today, we are in for a lot of trouble! For the first time there were more computer terminals on the exhibit floor than there were television monitors! (Last year, in Los Angeles, there were more limousines in the parking lot than there were earth terminals) — you can tell things have changed a lot, but I'm not quite sure what it all means.

Some of the instant impressions on the exhibit floor may give you some idea of what went on — there were more "*security equipment*" people than at any other show. From their numbers you would think that the entire cable industry is offering all sorts of alarm services to a public that is clamoring for them! To my knowledge it has not been determined yet if alarm services on cable will really prove to be a profit center or not.

Naturally "*addressability*" was a big word on the floor, and in the sessions. Everyone agreed that *if* and *when* it comes, it may or may not be the greatest thing since sliced bread — but after that, there was little to agree upon. One cable wag said it best when he noted that "*. . . last year they showed us little black boxes with nothing in them; this year they have something in them — next year maybe they will work!*"

Another "hot" topic on the floor this year was data and voice transmission by cable. We are all getting closer to true "broadband" uses of cable, and the equipment costs and supplies are becoming both reasonable and available to actually do some of the things we have heard talked about for years. Now we have to go out and find out who really wants to pay for it, and how much to charge for it. There could have been a whole meeting just devoted to that.

While there were certainly a lot of people at the show, there was a universal complaint that you could never really get someone to sit still long enough to have a decent conversation. There were *SO* many things going on, and *SO* many events to go to and *SO* many people to see that inevitably there was a lot of short-changing going on. Certainly there were many unannounced meetings going on in hotel rooms to conclude deals — probably at least as many as the number of press conferences designed to ballyhoo some new deal. It was all part of the carnival atmosphere.

As an observer of the parade, I would have to say this was one of the slickest productions I have ever seen. I suspect that the "image" of the industry that was presented at The Show was, as usual, slightly overblown, and contained far too many sequins to really equate to what is happening out in the real world. To the degree that the press, or mayors, Senators, Congressmen, etc. get the wrong idea about our in-

This was definitely a show-stopper — Group W featured life-size plaster figures of on-air talent, projecting a live presentation periodically upon their faces. This particular shot was of the featured newscaster who will be presented on the SATELLITE NEWS CHANNEL. On the opposite side of this set, Shelly West and Larry Frizzell were plaster-cast giv-

Just a shot of one of the entrances into one area of the

Bob Heinrich of KLUNGNESS Electronic Supply enjoyed all the traffic in their booth; the KES popcorn machine and the pretty little girl dispensing it certainly drew the crowds there.

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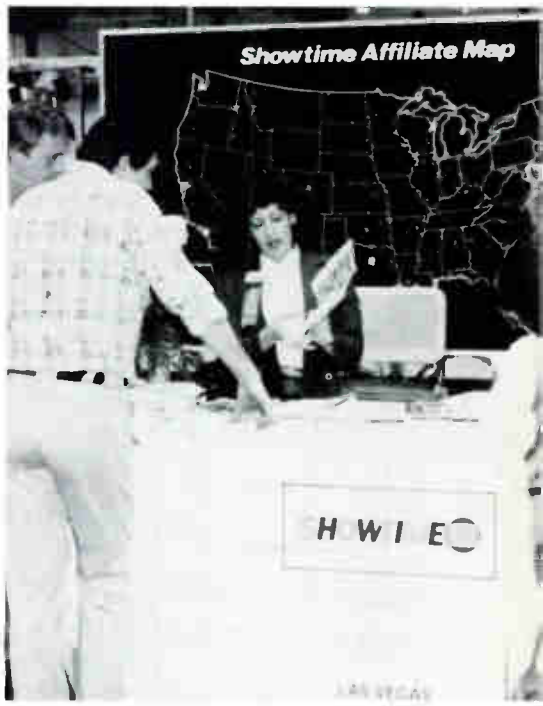
ing periodic musical renditions, featuring Group W's NASHVILLE NETWORK. This entire booth, with its different services, was one of the most popularly visited on the convention floor; at THE DISNEY CHANNEL sections, Mickey Mouse himself was available for souvenir photographs.

TIMES FIBER had a most unusual and outstanding booth with display arms coming out of a hub, as shown, with the upper floor used for sales discussions and conferences.

exhibit floor.

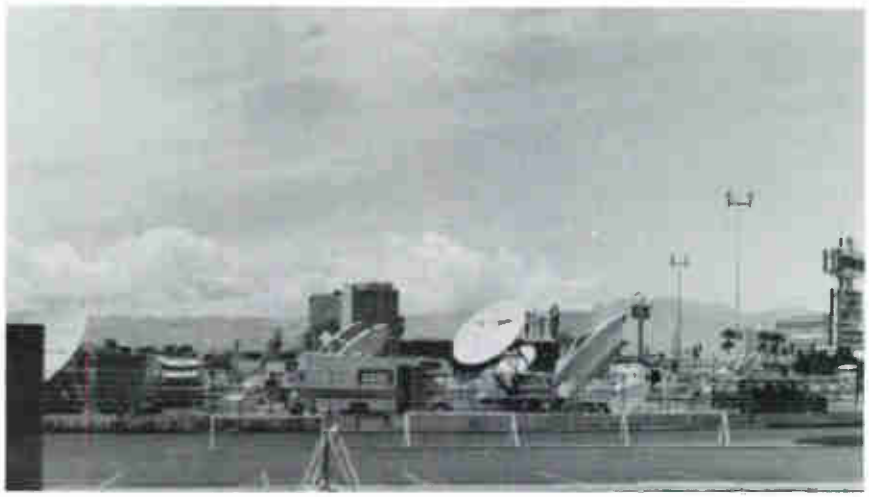
From Canada, John Dooyeweerd represented ALPHA Technologies; he will also be at their exhibit at CCOS, and our visitors will have an opportunity to meet him.

Bob Toner, TONER CABLE EQUIPMENT and TONER CABLE COMPUTER, was really into a sales pitch; bet it worked too!



Kate High, SHOWTIME, was busy manning the booth and discussing services with prospective affiliates.

The OAK booth was always a busy one, featuring their **Dimension 2** and addressable equipment.



The outside area used for the display of the various earth stations was an outstanding sight and gave the passing traffic something unusual for double taking!

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dustry, and act accordingly, that is bad. But for the most part the intellectual content of The Show was good.

The Cable Industry finally got the point across in this meeting that there is truly a lot of competition coming at us out there. We also were a lot more honest about the problems encountered in technology such as "addressability". That is all to the good.

Announcements of new programming, or programming going into full-time service, like the *Weather Channel*, or the *Cable Health Network* bolstered cable's claim to be offering diversity. On the other side, panelists that argued that viewers were not really watching the "basic" tier any more brought both a measure of *reality* to the gathering when it came to the likely success of all the new services, and a marked *unreality* in that there was little, *if any*, mention of the fact that most systems don't have "tiered" service yet with the exception of a pay channel or two.

Again, and this comes from the bias of being CATA's Executive Director, and always trying to bring discussions of cable television back down to realistic terms, this Show focused on the *BIG systems*, the *BIG revenues*, the *BIG operators* and, in many ways, it ignored or forgot the fact that most of the cable industry does not fall into that category. To be sure, the number of subscribers in those very big markets now being wired is probably triple the number that the industry can or ever will wire elsewhere. It is a very promising and very expensive undertaking to bring cable to those large urban markets, and it is to the credit of all involved that The Show was a well-focused, smoothly run exposition dealing with the problems and prospects of dealing with that new marketplace. It's nice to know, however, that the rest of the cable industry will be represented too; that will happen at CATA's CCOS-82 in Nashville on July 3 to the 6th. See you there! □

The CABLE HEALTH NETWORK helped the conventioneers survive with their nut and fruit packages they passed out; their new services were described in their brochures being distributed by Lou LiPera to a prospective client.

The HUGHES Microwave Communications Division booth was beautifully presented and was a busy place, even though they were omitted from the list of exhibitors on the program.

Taking a center position in the DITCH WITCH was their new 350SX PLOW. This new plow is a compact, mid-range lawn plow with new features that let it outperform and outproduce anything in its class. This starts with ariable speed shaker system delivering the force needed to maintain maximum blade movement at cover depths of 12 to 24 inches, also allowing you flexibility as the soil conditions become more difficult. It has greater weight which allows you to hold traction and avoid slipping or stalling.

This 350SX is a standout in its class with many innovative features, including new chute design and blade choice, handling delicate TV cable with a 10-to-1 bend on a floating chute. Unitrolley design provides a one-piece trolley for the shaker system for less maintenance. Maneuverability and control is increased by a standard 4-wheel steer: front and rear wheels are steered independently to work more efficiently on slopes. Dual life cylinders provide the force required to vary depths in the most difficult plowing conditions. The plow life linkage provides greater blade clearance and a greater angle of departure on uneven terrain.

For more information on the 350SX, contact DITCH WITCH, P.O. Box 66, Perry, Oklahoma 73077.

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SHOWCASE!

MAGNAVOX MOBILE TRAINING CENTER 1982 SCHEDULE

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Atlanta, GA	10/13-15, 1982
	10/18-20, 1982
St. Louis, MO	11/03-05, 1982
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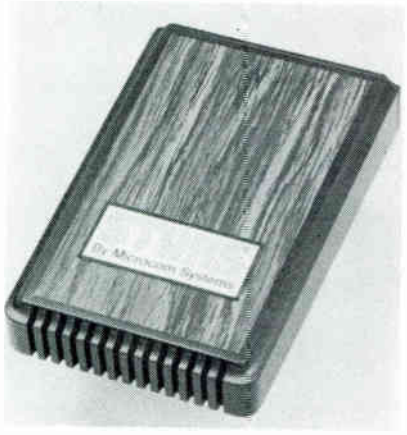
Contact: Larry Richards - in New York State: (315) 682-9105
or Toll Free: (800) 448-5171 □

COMMUNICATIONS SUPPLY INC. EXCLUSIVE DISTRIBUTOR FOR MICROCOM SYSTEMS LTD — NEW S.T.A.R.S. SECURITY SYSTEM

COMMUNICATIONS SUPPLY is distributing exclusively Microcom Systems' first in a series of products designed to secure premium service television signals. The new multi-tier S.T.A.R.S. (Scrambling, Tiering, and Recovery System) incorporates horizontal interval scrambling, leaving the ver-



tical interval untouched and available for future services.

The STS2000 Scrambler requires only video and IF inputs for complete operation. The programmable STR200 Descrambler is compatable with all standard CATV converters and will secure an unlimited number of channels with up to eight levels of tiering combinations. The system utilizes a sophisticated proprietary coding chip to provide a uniquely high level of security.

Optional features include an STC2200 System Controller which ensures intertier incompatability in multi-tier

operations. The head-end main frame can accommodate eight scramblers, a power supply and one data processor interface for future addressability.

For more information, contact Communications Supply Inc., 724 East Union, West Chester, PA. 19380. Toll free number is 800-345-8266 (U.S.) or 800-662-2428 (PA.) □

WINEGARD INTRODUCES SUBSCRIBER TAPS

W. E. "Bill" Stone, vice-president of sales **Winegard CATV Division,** has announced the introduction of 2-way and 4-way subscriber taps to its line of CATV equipment.

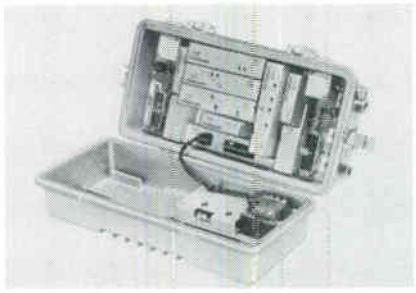
The new taps have a bandpass of 4-400MHz with values ranging from 4dB to 35dB.

Each Winegard tap is enclosed in a die-cast aluminal alloy housing with a corrosion resistant chromate finish. They can be aerial or pedestal mounted. Special collars hold the shrink sleeve tight to the housing. The 2-way tap can be changed to a 4-way without unseizing the cable.

Each tap has low insertion loss, high tap-to-tap isolation and can be used with any system.

"84" SERIES 400MHz TRUNK STATIONS

Robert M. Fleming, Jr., Vice-President of Marketing, Winegard Company, has announced the introduction of the "84" series of 400MHz, sub-split trunk stations.



The "84" series features complete modularity that allows the cable operator to buy exactly what he needs. This modularity allows changing, adapting or complete modernization of the cable system.

The modularity also provides for easy servicing of the trunk station. Modules that need repair can be easily and quickly replaced by the field engineer at the site. Another feature is the location for an attenuator pad so signals can be attenuated on short runs of cable. The advanced modular units are 100% station tested and backed by a 12-month warranty.

Construction of the 84 series is outstanding. Winegard uses a rugged die-cast housing. All modules are heat sunk to the finned casting for greater heat dissipation.

Winegard's "84" series allows 54 channels of distribution throughout the cable system.

Winegard's 400MHz equipment is available now to CATV operators. For more information contact W.E. "Bill" Stone, National Sales Manager at 1-800-523-2529. □

C-COR ANNOUNCES NEW MIDSPLIT PRODUCTS

C-COR Electronics, Inc., has developed a series of new midsplit amplifiers for use in institutional cable systems and in data transmission systems. The midsplit amplifiers differ from the traditional subsplits in that the frequency response is divided in half, allowing equal amounts of information to flow in the forward and reverse directions. The development of these new midsplit amplifiers is a good example of the way C-COR engineers are adapting proven, reliable products to meet the needs of individual customers, and meeting specific requirements in the cable TV and data transmission fields.

Examples of practical application of

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these new C-COR products for data transmission include six specially built midsplit amplifiers for 3M Company's CS Squared rural telephone and television system and a midsplit designed for use in GE Cablevisions's Grand Rapids, Michigan, traffic control system. Midsplits are installed in institutional cable systems to link networks of schools, banks and other financial institutions, and utilities, for example.

To accompany its previously developed T-530 midsplit trunk amplifier, C-COR has added two line extenders, the E-530 and the E-536. The E-530 is a 27 dB foward gain line extender with a reverse bandwidth of 5-83 MHz and a forward bandwidth of 118-330 MHz. The E-536 is a 27 dB foward gain line extender with a reverse bandwidth of 5-83 MHz and a forward bandwidth of 118-400 MHz. These line extenders will help to significantly reduce the cost of institutional cable systems by reducing the number of trunk amplifiers required to feed institutions, etc.

C-COR has developed a new range of midsplit trunk amplifiers, the T-54X series. The T-540 is a 21 dB spaced trunk with a reverse bandwith of 5-112 MHz, and a foward bandwidth of 150-330 MHz. The T-545 is a 21 dB spaced trunk with the same reverse bandwidths as the T-540, but with a forward bandwidth of 150-360 MHz. The T-546 is also a 21 dB spaced trunk with a 5-112 MHz reverse bandwidth and a 150-400 MHz foward bandwidth. The level control system of the foward signals of all of these trunk amplifiers can be either C-COR's well proven modulated pilot system, or TV carrier level control system. Reverse level control is achieved using a Thermal Level Control (TLC). All T-54X trunk amplifiers have provision for a plug-in bridger amplifier module and up to four distribution outputs. Feeder or trunk reverse switches are available for all of the T-54X trunk amplifiers.

To compliment new T-54X series midsplit trunk amplifiers, C-COR has two new midsplit line extenders, The E-540 and the E-546. The E-540 is a 27 dB gain line extender with reverse bandwidth of 5-112 MHz and a forward bandwidth of 150-330 MHz. The E-546 is a 27 dB gain line extender with a reverse bandwidth of 5-112 MHz and a foward bandwidth of 150-400 MHz.

All of these new midsplit amplifiers fit into standard C-COR housings and take standard accessories.

C-COR designs and manufactures broadband amplifiers and other electronic equipment, including passive devices and special amplifiers with laboratory, industrial and military applications. The company also designs the coaxial communications/distribution systems that use their distribution equipment.

For further information, contact: Stuart L. Dance, VP-Sales & Marketing, 60 Decibel Road, State College, PA 16801 (814) 238-2461. □

BELDEN/ISO INTRODUCES MOLDED CABLE ASSEMBLIES WITH STRAIGHT HANDLE DIN CONNECTORS

A new line of molded cable assemblies with straight handle DIN connectors has been introduced by Belden Corp.'s interconnect System Operation (ISO), Gastonia, N.C.

This molded cable assembly interconnects analog and digital signals in computers, word processors, test equipment, instruments, control devices, recorders/players and dictation systems where miniature, high quality multi-position connectors are required. Terminations are DIN-type male connectors fully molded to lock out dust, dirt, moisture and other contaminants. DIN connectors feature a rugged strain relief, high dielectric insulation, heavy silver-plated brass pins, positive polarized mating, and friction retention.

Available with 3 through 8 pins, these straight male plugs may be fully molded onto unshielded or shielded cables of any practical length. Retractile cords may also be specified. Molded cable assemblies are available on special order with a wide selection of standard and special features.

DIN molded cable assemblies can be custom terminated at the other end of the cable with IDC, rack and panel and PC connectors, phone or phono plugs, lugs, clips, clamps, strain reliefs, blunt cut-off, stripped only, or stripped and tinned.

Many custom features are available on special order: handle and cable colors; molded-in logo or other mark; wiring patterns; retentions; additional shielded and unshielded cables; and custom terminations.

Material specification: Molded handle: 60°C molded black butyrate or 80°C vinyl; Shroud: brass, bright nickel-plated; Pins: brass, silver-plated; Insulation: molded thermoplastic.

For additional information, write Joe Prechodnik, Sales and Marketing Manager, Belden Corp., Interconnect Systems Operation, 105 Wolfpack Rd., Gastonia, NC 28052. □

GENERAL CABLE EXPANDS OPTICAL FIBER CABLE LINE FOR COMPUTER/OEM MARKETS

General Cable Company's Fiber Optics Division today announced expansion of its line of GenGuide™ optical fiber cables to include new types designed for the computer and OEM markets.

In making the announcement, Allen Kasiewicz, Marketing Manager of the Fiber Optics Division said, "These cables are ideal for use in short haul communications, specifically for point to point and local area net applications".

The new cable types, GenGuide-SX (simplex) and GenGuide-DX (duplex) embody multi-mode graded index glass fibers **having a diameter of 50 microns, cladding to 125 microns, a protective coating to 500 microns and an overall tight nylon buffer to a final diameter of 950 microns.**

The fibers employed have a numerical aperture of 20 ± .015. Any combination of attenuation and bandwidth can be provided, typical values are:

Attenuation:	4, 5 or 6 dB/Km @ 850 and 2 dB @ 1300 nm wavelength
Bandwidth:	200, 400, 600 or 600 MHz-KM

Both cables are provided with a highly visible bright green PVC jacket. The cables can be quickly and easily placed and are terminated readily with most commercially available optical connectors.

Full details are available from: General Cable Company, Fiber Optics Division, 160 Fieldcrest Avenue, Raritan Center, Edison, NJ 08817. □

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POLELINE'S NEW CABLE BLOCK — TRAQ

Poleline has developed a complete line of products designed to make cable construction faster, safer, and more economical. TRAQ cable blocks offer you these distinct advantages:

* Compact size — trunk cable is held less than 2 1/2" from the strand making lashing easier and keeping the cable straight as it is lashed.
* No snagging on telephone drops
* Unique gate for mid-span applications
* TRAQ blocks will not move along the strand until the lasher pushes them.
* Practically indestructable — they'll survive a drop from strand height, and because they're light weight, they won't damage autos or other property when accidentally dropped from a pole.

The TRAQ block is made for **television cable.**

TRAQ I for single cable construction — only 5" high, less than 3" wide, and weighs only 3 ounces

TRAQ II perfect for dual cable construction — only 6" high, 4" wide, and weighs only 6 ounces

TRAQ IV — This is the ultimate time and moneysaver as it enables you to handle four cables at once and is 10" long, 4 1/2" wide and weighs only 12 ounces.

CHECK THIS COST COMPARISON!! TRAQ I single cable is $7.15; TRAQ II dual cable is $10.50; and TRAQ IV four cable is $16.50, making for the best value on the market today. A TRAQ block costs less than half as much as a conventional block, and these TRAQ cable blocks are guaranteed against breakage from defects in workmanship.

For more information, call the Poleline Corporation, a subsidiary of RMS Electronics, toll free 800-221-8857, or write for information at 20 Antin Place, Bronx, New York 10462. □

COMMUNICATIONS SUPPLY OFFERING NEW PRODUCTS

Communications Supply has announced that they are distributing Phasecom's Earth Station Modulator Model 106. The Model 106 SAW Filter TV Modulator is a high performance Modulator, ideally suited to interface with earth station receivers, which gives full performance at a very low cost.

It provides a high quality vestigial sideband signal and excellent adjacent channel performance over the 54-300 MHz range. The IF video modulation stage utilizes a SAW (Surface Accoustic Wave) to provide stable, maintenance free, band pass characteristics along with flat group delay. Output circuitry includes a Sync-tip AGC circuit for constant output levels, and a Bandpass Filter to ensure low spurious output. Signal integrity is maintained throughout and includes fully enclosed IF and up converter oscillators as well as shielded filter circuitry.

Also under the exclusive distributorship of Communications Supply is the HP-50 High Pass Filter, manufactured by Triangle Manufacturing. The HP-50 High Pass Filter is a low-cost, compact filter that eliminates return noise in two-way CATV system applications. The smallest available on the market today, the HP-50 is ideally suited for use in multi-drop installations.

With a pass band of 52-500 MHz, the HP-50 has an insertion loss of 1dB maximum and a return loss of 14dB ± 1dB. It has an operating temperature range of −40°F to +120°F and is water resistant. Milled aluminum alloy body and brass finish tin plate connector.

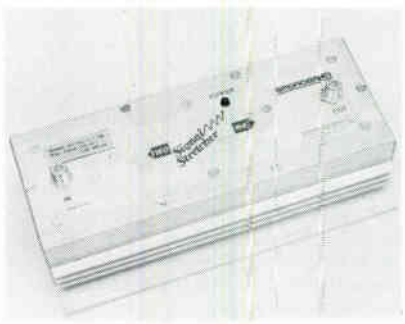
Also offered exclusively by Communications Supply is the new cable remoted CATV converter manufactured by Microcom Systems Ltd. This new converter, the MR1, offers full-feature performance at a very low cost.

The MR1 Remote Converter incorporates a reliable, field-proven 36-channel converter unit, and an attractive corded remote control. The rugged, dial-operated channel selector features long-life, low wear characteristics. The extremely low unit cost of $34.95 makes the MR1 ideally suited to mass installations in new franchise situations, or as a second set converter for existing customers.

For more information on the above products, contact Communications Supply, Inc. 724 East Union Street, West Chester, PA. 19380. Their toll free number is 800-345-8266 (U.S.) or 800-662-2428 in Pennsylvania. □

BROADBAND ENGINEERING'S SIGNAL STRETCHERS

Broadband Engineering's series of house-drop amplifiers meets the needs of fully-loaded 300 and 440 MHz cable systems. Termed "Signal Stretchers", the new amplifiers are designed to pro-



vide added gain for long drops, higher levels for multiple outlets and amplification for small apartment distribution systems.

The units have approximately 15dB gain and are available in one- and two-way versions. The two-way units have return capability in the 5 to 32 MHz range, with a maximum insertion loss to the return signal of 1dB. All units are powered by UL-approved Class II transformers that may be located remotely from the amplifier.

Broadband has announced that its BMK-53, a push-pull hybrid amplifier, is

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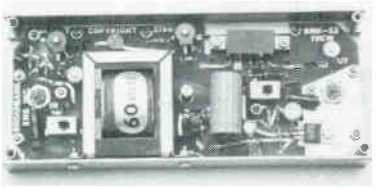
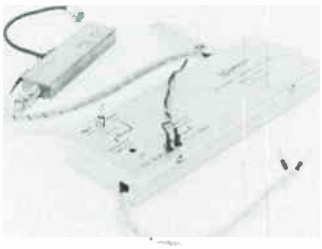


now available in modular form. Designed as a replacement amplifier for the Jerrold SLE 1, 20 or 2P line extender, it is ready for immediate installation in place of the old module. The standard BMK-53 has built-in equalization for 12 to 20dB of cable at 300 MHz and has a standard gain of 28dB maximum. It is also available in a high gain version with 32dB gain at upper frequencies. The amplifier continues to be available as a replacement assembly for th original die-cast module.

For more information, contact Broadband Engineering, P.O. Box 1247, Jupiter, Florida 33458 or call (305) 747-5000. □

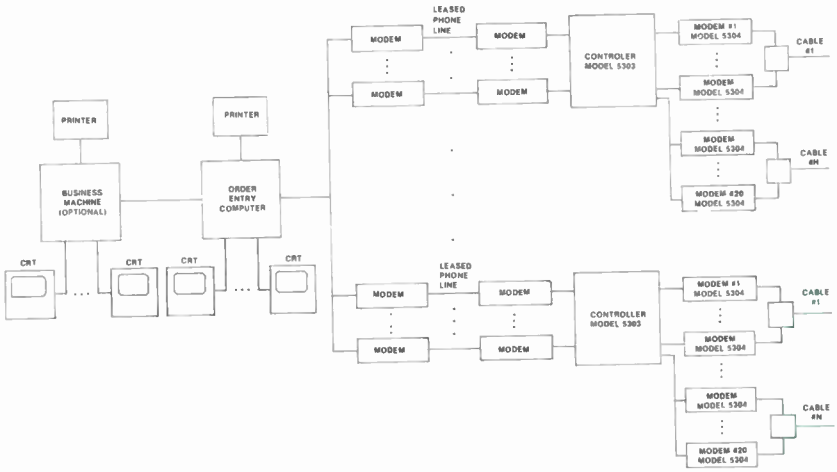
GTE INTRODUCES ONE-WAY AND TWO-WAY ADDRESSABILITY SYSTEM, MODEL 163 FOR EXPANSION OF 12-CHANNEL SYSTEMS, AND SUB-VHF BRIDGER SWITCHING

GTE Products Corporation, Sylvania CATV Division introduced a new Sub-VHF Bridger Switch option for the existing Series 2000 Trunk/Bridger Station. The Sub-VHF Bridger Switch Receiver and Controller allows systems to receive return video or data transmission from the distribution on a time assignment basis. The system will shut-off unused return lines, thus reducing noise build-up. The system will also facilitate troubleshooting of ingress by selectively switching off return lines until the area of interference is isolated.



Upgrade to existing stations can be accomplished simply by securing the Sub-VHF Bridger Switch to the 2000 Station housing with two of the station's existing mounting screws and with plug-in connections. No soldering or unsoldering is required.

GTE Addressable System



Also GTE announced a new station module that will allow present 12-channel systems having Sylvania equipment to increase channel capacity up to 35 channels without resplicing cable or respacing amplifiers and without significantly degrading system specifications. Because the Sylvania products have modularized functions, the new model 163 can easily be plugged into any of the existing Sylvania amplifier stations including the first stations manufactured more than ten years ago. The 163 module can operate in either an automatic or manual mode. Leman Dolby, Engineering Manager, stated, "Tests conclude that the 163 module has low noise figure and exhibits excellent distortion characteristics." With this module having a 2 dB increase in dynamic range over most lower gain trunk amplifier, a system operator can increase channel capacity inexpensively and benefit from the increase in revenue.

GET's new addressable system is designed to provide one-way or two-way communications between cable subscribers and the systems central office. Services that may be included in the systems include converter device inventory control, pay-per-view on any channel, subscriber polling, central office control of descramble, parental control or inhibit and service disconnect, to name a few.

The system's components include the Model 5303 Addressable Controller which controls up to 20 Model 5304 modems, and together will handle up to 200,000 subscribers. Additional controllers and modems can be used to expand the system beyond 200,000 subscribers. Each modem will process commands at the rate of 1000 subscribers per second.

The Model 4050 Addressable Module and Model 4051 Reply Module receive and send commands and may be either factory installed or can be field upgraded to the Model 4040 58-Channel converter introduced in the Summer of 1981. The addressable system is expected to be in production early 1983.

Raymond Pawley, Director of Marketing, stated that the ability to upgrade the Model 4040 58-Channel Converter allows the cable operator "...great flexibility because the addressable features need not be purchased until the cable system's financial conditions allow".

GTE Products, Sylvania CATV Division is a major supplier of CATV transmission products and converters. For more information, write to Customer Service, 10841 Pellicano Drive, El Paso, Texas 79935 or telephone (915) 594-3555. □

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Associate Roster

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
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
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 Euipment)** 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-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

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Distributors	Manufacturers	Service Firms
D1—Full CATV equipment line	M1—Full CATV equipment line	S1—CATV contracting
D2—CATV antennas	M2—CATV antennas	S2—CATV construction
D3—CATV cable	M3—CATV cable	S3—CATV financing
D4—CATV amplifiers	M4—CATV amplifiers	S4—CATV software
D5—CATV passives	M5—CATV passives	S5—CATV billing services
D6—CATV hardware	M6—CATV hardware	S6—CATV publishing
D7—CATV connectors	M7—CATV connectors	S7—CATV drop installation
D8—CATV test equipment	M8—CATV test equipment	S8—CATV engineering
D9—Other	M9—Other	S9—Other

Katek, Inc., 134 Wood Ave., Middlesex, NJ 08846 201—356-8940
Klungness Electronic Supply, P.O. Box 547, 107 Kent Street, Iron Mountain, MI 49801 (**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 Systems, P.O. Box 57, 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**)
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
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—257-4257
United Video, Inc., 5200 S. Harvard, Suite 4-D, Tulsa, OK 74135 (**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

Note: Associates listed in bold are Charter Members.

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classycats

Classy-Cat advertising is offered as a service by CATA for its membership. ANY member of CATA may advertise in the Classy-Cat section FREE of CHARGE (limit of 50 words per issue - 3 issues per year.)

CATA offers three types of memberships:

1.) Systems - paying regular monthly dues based on number of system subscribers.
2.) Associate Members - pay an annual fee.
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Deadlines for all Classy-Cats is the 1st of the month for the following month,s issue.

Address all Classy-Cat material to: CATJ, Suite 106, 4209 NW. 23rd, Oklahoma City, Okla. 73107.

CORPORATE PROJECT ENGINEER

Excellent new opportunity with dynamic and growing cable M.S.O. This position will coordinate specific engineering projects, including coordinating with regional and system engineers, implementing system upgrades, hands-on FCC proof of performance testing, and system and microwave planning and support functions.

This person must be willing to work on-site side by side with existing system regional staff to carry projects through to completion.

Matrix has an immediate opening for an individual to fill this position. The successful candidate will have at least 3-5 years related experience covering a wide variety of projects.

The ability to organize, implement and complete projects on a timely basis is necessary. This position will report to the president.

We offer an excellent salary based on experience and a superior benefit package.

For consideration forward a resume and salary requirements to: **Matrix Enterprises, P.O. Box 200, Franklin, TN 37064, Attention: Bill Kotas (615) 790-0222.**

For Sale

Oak 7 ch Block Converters, Model B 19 700 ea in original carton. Contact Joe W. Bain, Cablevision Systems, Inc. Box 1624, Seminole, Okla. 74868 (405) 382-2878.

FOR SALE

Line Ward Model L-1 Cable Line Layer. Used one summer. Asking $4,500. Price includes extra blades and a Greenlee Pipe Pusher. Phone (307) 468-2815.

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CFTN	INPUT	OUTPUT
977	I-1	3
1105	H	2
7776	I	1
82	I	2
214	E	4
3600	E	2
1706	B	2
1318	I-1	4
	DUALS	
36	H-2 / I-1	4

CONTACT:
Ms. Linda Ellis
United Cable Television Corporation
P.O. Box 5840
Denver, CO 80217
(303) 779-5999

TECHNICAL OPPORTUNITIES

Matrix Enterprises has several new technical positions open in Tennessee, Kentucky, Ohio and Illinois. These positions require experience in all areas of system maintenance and operation.

System Engineer — Requires extensive knowledge of headend, the ability to trouble shoot to the electronic component level and experience with Bi-directional, inter-active systems. 1st FCC license required!

Plant Foreman — 3-5 years all round CATV experience needed for system service and maintenance.

System Technicians — All levels for system service and maintenance.

We offer an excellent salary based on experience and a superior benefit package.

For consideration forward a resume and salary requirements to: **Matrix Enterprises, P.O. Box 200, Franklin, TN 37064, Attention: Bill Kotas (615) 790-0222.**

MANAGER/TECH

Someone with management skills, strong technical skills to include system maintenance, headend work and system proofs. Excellent salary and benefits. Send resume to: P.O. Box 857, Rolla, Mo. 65401.

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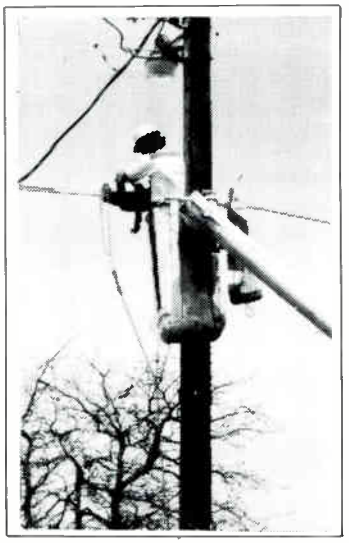

ATTENTION!

SYSTEM MANAGERS — TECHNICIANS NEEDED

Excellent opportunity for system managers and technicians for our systems in Colorado, Texas, and Oklahoma. Need qualified personnel for these Southwestern locations; good working conditions and opportunity for the right people who want to work and stay actively involved in the cable business. These systems have good equipment to work with and offer excellent situations to grow in the cable business. If interested, send resume to the box number indicated below.

Box 71080
c/o CATJ
4209 N.W. 23rd
Suite 106
Okla. City, OK 73107

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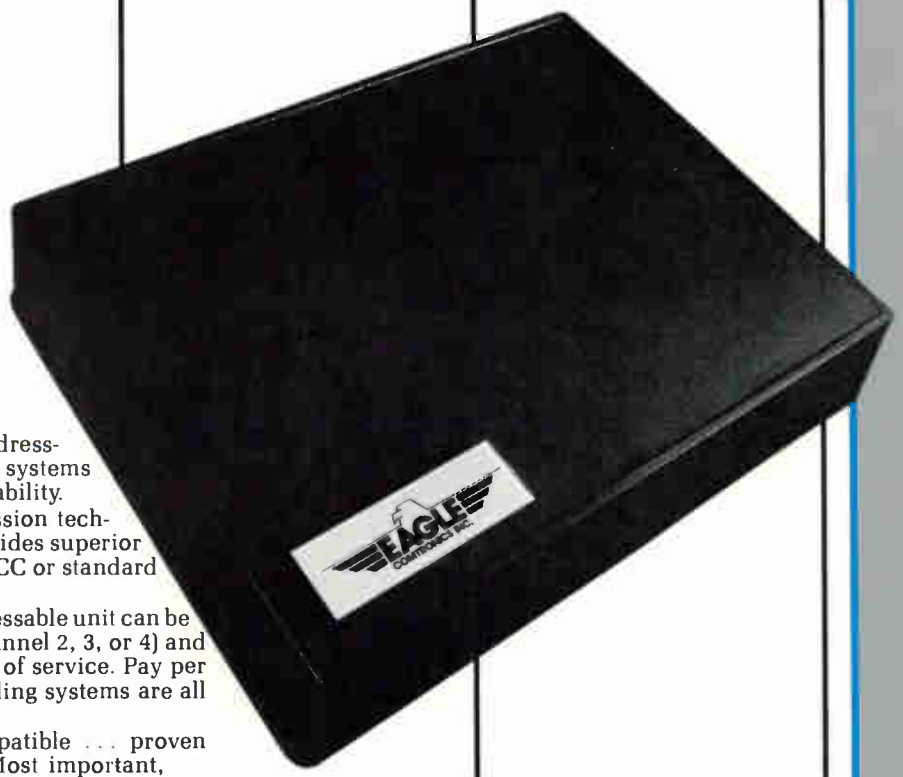

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