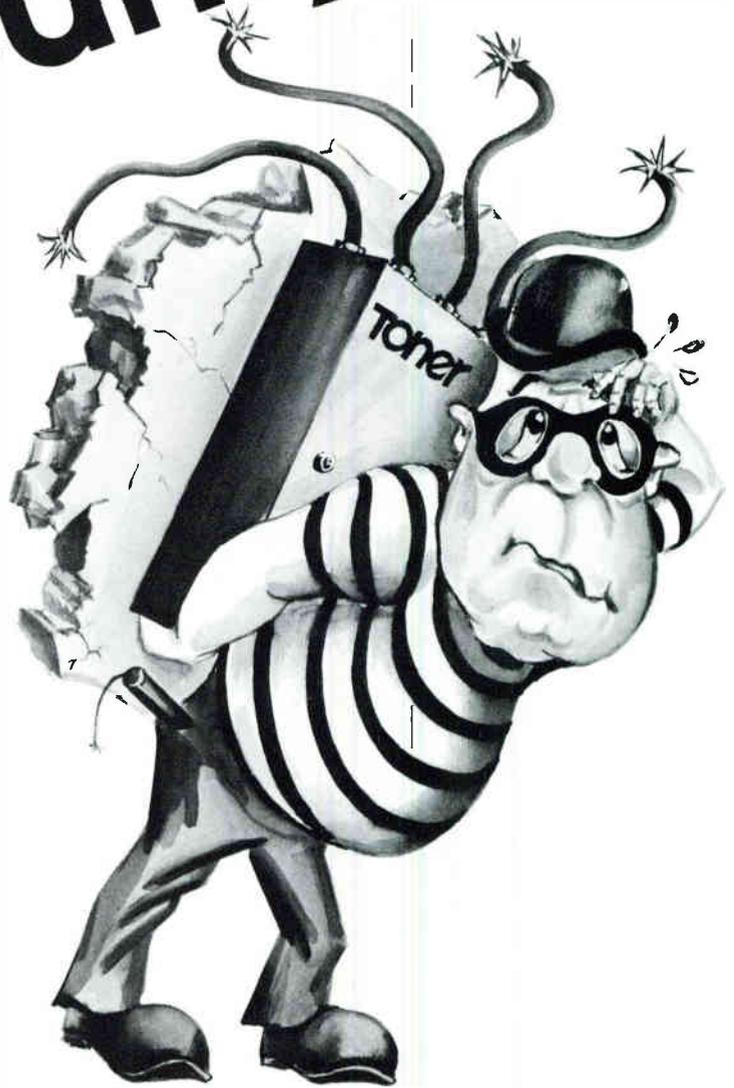


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CATJ, The Official Journal for the Community Antenna Television Association is published as a service for Association Members and other providing services to the industry.

### FEATURES

#### ON THE COVER

*Just Who Is Peter Athanas?*

*Peter Athanas, better known as Pete to his associates, is the General Manager of the Southern Wisconsin Cable Company, as well as the Ripon Cable Company, having started in the electronics business as a radio engineer/announcer. This Navy veteran received an Associate Degree from the DeForest Institute in Chicago and used this background to further his responsibilities in radio with the subsequent involvement in cable television in 1971.*

*Pete has been involved with CATA since its early days, becoming a director in 1975, serving as Vice President and on the Executive Committee 1980 and 1981, and being elected to a two-year term as President July 4, 1982. Peter has also served his state organization as a director for the Wisconsin Cable Communications Association, as well as various local and civic responsibilities.*

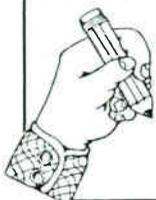
*Pete and Arlene, his wife of 30 plus years, have four children, who have joined us at CCOS at one time or another.*

*The CATA members look forward to a very successful and progressive two years under Pete's guidance, and CATJ salutes him as "leader extraordinaire"!!!*



#### SPECIAL IN THIS ISSUE

**WANT TO TEST WHAT YOU KNOW ABOUT CABLE TECHNOLOGY?? WHAT YOUR TECHNICIANS KNOW???** Check the SubCard for a basic knowledge test; we have perforated it for your convenience to duplicate it. Answers will appear in the October issue. This way cable operators will have a means of testing to evaluate their employees and then consider the appropriate training for them.



- 6 **CHANNEL CAPACITY ENHANCEMENT AND COST EFFECTIVENESS . . . INTERESTED IN INCREASING YOUR CHANNEL CAPACITY FOR THE FEWEST DOLLARS?????** Fred Rogers, President of Quality RF Services and Steve Whitaker, Technician for Cable TV Services, collaborated on this presentation to assist the cable operators in delivering more quality-reception.
- 22 **HOW DO YOU LIKE YOUR EGGS AND SATELLITE SIGNALS? SCRAMBLED! . . .** Ralph Haimowitz, CATA Director of Engineering, explains the scrambling program being initiated by HBO and the details of the "black box".
- 24 **DUAL BEAM MODIFICATION . . .** CATA Director from District #7, Wayne Sheldon, attended a Hughes Communications demonstration concerning how an existing TVRO antenna can receive signals from two satellites simultaneously . . . the principle for this new feed system is not new to the antenna art, with the concept going back to World War II.
- 52 **PART -4 of CABLE TECH'S FILTER COOKBOOK . . .** Glyn Bostick of Microwave Filter in his series on filters goes into 75 Ohm amplitude equalizers and Levellers.

### DEPARTMENTS

- 4 **CATA-TORIAL . . .** CATA president, Peter Athanas, explains the CATA position on contacting your Congressmen on subjects crucial to the cable industry and why it is so important to respond when you are asked to participate in a campaign.
- 10 **LETTERS TO THE EDITOR**
- 20 **HAIMO-WITS**
- 28 **S.J. BIRKILL ON EXPERIMENTAL TERMINALS . . .** Mr. Birkill reviews the situation with ANIK C, taking into consideration the few changes in Telesat's plans.
- 46 **WASHINGTON UPDATE . . .** Why does CATA support S.2172???? Steve Effros, CATA Executive Director, presents his column this month in a question and answer format to explain that position.
- 56 **NEW PRODUCT REVIEW . . .** This is a new section provided to CATA Associate Members where they can get "commercial" in presenting information on new products and/or services. The first presentation is on the new MICRO-1.5 Central Alarm System from CableBus Systems; this is an intermediate size cable alarm system designed to accommodate 4,000 to 8,000 subscribers in the initial configuration.
- 63 **ASSOCIATES ROSTER . . .** New format in an easier-to-read design, with the 800 numbers for your convenience.
- 66 **ASSOCIATES SHOWCASE**
- 68 **CLASSIFIED**

## CRYING WOLF

Peter Athanas  
President of CATA

You all know the story about the little boy who cried "wolf". He sounded the warning in his community so many times that when a real wolf did show up one day, he couldn't get anyone to believe him until it was too late. The cable industry has a similar problem — but it has to do with legislation on Capitol Hill.

It seems like during the last year or two there hasn't been a month that has gone by without someone, be it the NCTA, CATA, or the regional or state associations, sending me an "urgent" message that said I must telegram, call, write or do something with my Congressman, Senator, State Assemblyman or whoever **IMMEDIATELY!**

Well, I'm just like most of the rest of you. I have a business to run — cable to string, maintenance work to do, a new marketing campaign to work on, or a renewal franchise fight to wage. Just because I am now President of the Community Antenna Television Association doesn't mean I don't have to do my business too! The difference now is that I get a little more in-depth briefing from our Washington representative on what is going on — so now I know a little more about **WHY** we are always being asked to write, call, etc. I want to explain it to you so that you will understand it too — that way we can avoid that day when the "wolf" really **IS** at the door and we don't listen to the alarms.

The biggest problem, of course, is that the cable television industry is involved in so many different battles at once that it is really true that our Representatives and Senators have to be contacted frequently. CATA, for one, has tried to keep its members totally informed on what is happening in Washington so that it does not come as any surprise to you when we ask you to swing into action. The other reason for keeping you fully informed, through the CATAcable, is that we want to make sure you know what you are or are not **supporting** before you make that telephone call. We do not think it is a good idea to just TELL the membership to do something — instead, any action that is taken should be informed action.

We have also disagreed with our lobbying colleagues in the past about when to "ring the bell" and get the members to take action. We are very sensitive to the fact that if we make that request too many times it will fall on deaf ears just when we need it the most. However in the recent past, even CATA has been out "beating the bushes" for cable operators to contact their Congressmen and Senators. **Why?**

The simple truth is that an awful lot of very important things are being considered on Capitol Hill right

now that have a direct impact on the cable industry. Unlike many other industries which may see one legislative effort per year that has any direct bearing on them, cable television is in the middle of an avalanche of legislation that is directly aimed at us. Just take a quick look; **Copyright and Distant Signal legislation (H.R. 5949), Comprehensive Telecommunications Legislation (H.R. 5158), and the first "Cable" bill** to be seriously discussed since 1965 (S. 2172). And all of these bills were being considered **AT THE SAME TIME** during the month of July! There is no wonder that we all got letters and telegrams from our trade associations screaming for help!

**Is it really all worth it?** According to the "pros" in Washington, **you bet it is!** Here is how it works: The lawyers and lobbyists in Washington can spend all day and all night talking to Congressmen and Senators about the problems of the cable industry or the reason we need any particular piece of legislation. That effort may or may not fall on sympathetic ears. But when that same Congressman starts getting calls from his district, or when the Senator finds out that there are a lot of jobs in his home state at stake based on the legislation in question, **THEN they listen!** This is simply the way things are in Washington (and in every State Capitol too). That is why the individual operator's time and effort is so important in some of these campaigns.

There is another way to do it, and this way is even more successful in the long run; get to know your Congressman or Senator on an ongoing basis — that way when questions about cable arise, you will be the one that he or she seeks out for guidance rather than the other way around. That is the best way to keep your interests in the forefront!

Let's take a look, for a moment, at our "adversaries" in some of these battles on Capitol Hill. You will quickly understand why we have to keep those "cards and letters" coming! To begin with, **there is Ma Bell** (we could end here too!). She just spent over two million dollars to be sure that Tim Wirth's telecommunications bill never saw the light of day. Now along with all the money, Ma asked three million folks to write their representatives! Two million of her stockholders and one million of her employees were asked to write. According to some Congressmen they got more mail on that one issue than on anything else this year! Then, of course, there is the Copyright fight. Right now, it is being held up because the religious broadcasters are insisting that they should be included in the "must carry" rules regardless of how many

people are watching them. All of the religious groups have asked their members to write Congress. Need we say more? Once again the Representative's "IN" box was overflowing with mail about a "cable" bill. Finally there are the cities — as you know, they are not too keen about the provisions of S. 2172. For each franchise there is a city! And a city attorney, and a city access group, and an educational group etc., etc., etc. They are all writing too! Is it any wonder that we are having a tough time in Washington. It is even tougher when the cable industry does not respond to the urgent calls of our association leaders in Washington. That is what is happening now. The calls are going unanswered. **The letters are not being sent.** We can never win these wars if we are not prepared to do some of the fighting ourselves!

Happily, the record of CATA members has been quite good. On the few occasions when CATA has issued an all-out call for support or opposition to a particular bill (AFTER explaining the reasons to our members), we have gotten gratifying results. We want to make sure that continues. We know that it is difficult to find time to do all the things you are called upon to do as it is. We also know that we are in a very

unique time in the history of cable television. The legislation that is currently on Capitol Hill, and which, in all likelihood, will be back up again at the beginning of the next session will be the last major go-round in the regulation of cable television for some years to come. Certainly this will be the last hurrah for copyright legislation (it may not even make it back on the docket next year!) Everyone is fed up with the issue. As far as comprehensive cable legislation is concerned, that is the key to our future — we will **live or die** with whatever comes out of the debate on this legislation — and it will be a hard battle to get what we want. Right now things are going in our favor, but you can be sure that the city folks will be doing a lot of work to derail S. 2172. The only thing we can do is keep plugging for it. If you don't do your part, you only have yourself to blame if this legislation is not passed.

For our part, CATA will make every effort to assure that we do not "cry wolf". We appreciate the danger of calling for help too many times. **Let me assure you that when we do call — it is for the best interests of ALL cable operators, and I hope you will respond to the call.** □

## CATA MEMBERSHIP APPLICATION

Please enroll my CATA system(s) in the COMMUNITY ANTENNA TELEVISION ASSOCIATION (CATA). I understand that we have the right to cancel our membership at any time. Please see that I receive all of the initial CATA material.

System Name \_\_\_\_\_  
 System Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Individual Authorizing Membership \_\_\_\_\_  
 Telephone(\_\_\_\_\_) \_\_\_\_\_

### About Your System— CONFIDENTIAL— For CATA use Only

- Number of current subscribers (FCC count) \_\_\_\_\_  
 Projected number of subscribers \_\_\_\_\_
- Number of homes in franchise area \_\_\_\_\_  
 Top 50 Market (35 mile zone)  
 Second 50  
 Smaller TV Market  
 Outside All Markets
- Channel capacity \_\_\_\_\_  
 System start-up date \_\_\_\_\_
- Do you plan to build a TVRO earth station?  Yes  No
- Congressional District \_\_\_\_\_

### ABOUT YOUR CATA DUES STRUCTURE

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

Numbers of Subs \_\_\_\_\_  
 X .03 \_\_\_\_\_

Sub Total \_\_\_\_\_

+ Surcharge \_\_\_\_\_

Total \_\_\_\_\_

PLEASE ATTACH CHECK FOR THAT AMOUNT WITH APPLICATION.

### Note on Corporate Membership:

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

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

CATJ SUBSCRIPTION RATE FOR CATA MEMBERS IS \$14.00 per year.

If you are not presently a subscriber and wish a new subscription, enclose \$18.00 for you CATJ magazine.

# Increasing Channel

# Capacity

# For The Fewest



BY: Fred Rogers, President  
Quality RF Services, Inc.

Steve Whitaker, Technician  
Cable TV Services

The need for improved picture quality for pay channels and extra competition from adjacent systems has placed pressure on the cable industry to deliver better quality reception. The question is, "What is the most viable and cost-effective method of enhancing picture quality?" Heretofore, there has been but a single guaranteed method, but technology has given birth to still another!

The most obvious choice for overall system improvement is a **total rebuild**. Replacing the cables, connectors, amplifiers and passives solves the problems — **or does it?** The state-of-the-art equipment that's now available has to give the picture quality needed to please even the most demanding of subscriber standards. The forthcoming advantages will be less maintenance, better picture quality, and satisfied customers.

But, there are several problems that one encounters in trying to rebuild a systems. Primarily, there is a **huge capital outlay**. Secondly, and more obscure, is that the **labor and technical force available to the market today is in very short supply**. Thirdly, there is the **lack of availability of the equipment needed** (cable, connectors, amplifiers, etc.). Presently, many items are becoming hard to acquire, and this problem will increase as the year progresses. Additionally, the purchase of construction equipment must also be considered when pondering a major rebuild.

However, **there is an alternative**. Often the cable passive devices and many of the other pieces of equipment in the system itself are basically sound. The **main objectives** should be **increased system performance and improved system reliability**. This would allow additional channels so that the system could become

more profitable. An **inexpensive** way to expand a system is by updating the modules in the system to 21 or 35 channel capability without replacing anything but the actual amplifier modules themselves. It is an established fact that the majority of system reliability is in the amplifier modules, and if one has a good solid amplifier module with state-of-the-art performance capability, excellent picture quality can be delivered. **What if these modules could be easily installed in the original housings so that cable would not have to be kinked or housing replaced?** The labor force would not have to be out in the field earning overtime wages while exerting wear and tear on existing bucket trucks and other construction equipment. In other words, there is a lot of cost involved and many headaches accompanying the overhaul of a cable plant.

If one could substantially **save on the capital investment** in system updating, that money could be used in the future to take advantage of the technological advancements that are commonplace in the CATV market. Just think back 20 years ago when

tube-type gear was commonly used. Suddenly, transistorized equipment became available, and that equipment soon made tube-type equipment almost obsolete.

Then, another five years down the road, another piece of transistorized equipment was developed that made the original units obsolete. After that came the push-pull/discrete amplifier and then the hybrid amplifier. It has become obvious that another step in the life of cable technology is about to unfold — at least within the next five years or so. It may be **fiberoptics, 500 MHz bandwidth**, or some other form of communications.

It is becoming obvious that modules would plug directly into existing housings, providing extra channel capability and improved specifications, would be the perfect answer to many rebuild problems in needy systems. What should be looked for in these units? There are two primary options. One may buy the complete module that plugs into the housing, or one may buy an update board that plugs into the original module. A comparison of the two is beneficial.

	NEW EQUIPMENT	P.C. BOARDS
1)* COST		X
2)* DELIVERY		X
3)* EASE OF INSTALLATION		X
4)* NOISE FIGURE	X	X
5)* CROSS MODULATION	X	X
6)* CASCADABILITY	X	X
7)* SURGE PROTECTION	X	X
8)* LIFE EXPECTANCY		X
9)* CHANNEL CAPACITY	X	X
10)* PROVEN RELIABILITY		X
11)* TECHNICAL FAMILIARTY (Re-Training Technicians)		X
12)* NO OUTSIDE CONTRACTOR		X

# How to make a bigger profit in smaller towns.

**Combine communities to make them profitable.** Hughes AML has the features you need to combine several small, outlying communities into one profitable system. Anyplace within 35 miles line of sight is economical to serve. And you can start by adding the most profitable one first, instead of the closest one. You can't do that with cable.

**Make sure you have the features you need.** Hughes AML has lots of features that are designed with operators in smaller markets in mind. You can offer as few or as many channels as you need,



from 12 to 60, expanding them easily as your needs grow. And you can deliver all the services your customers have been reading about, too. One way or two way transmission, video or data, local origin and subscriber interactive systems are all easy to supply. Handles multiple tier and addressable scrambling systems, too.

**Offer better picture quality.** Hughes AML allows very flexible hub placement, so a single headend can be placed in the

optimum location. Short cascades from each hub mean better picture quality, greater reliability...and more satisfied customers.

For more information on Hughes AML systems, write or call: Hughes **MICROWAVE™ COMMUNICATIONS PRODUCTS**

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*NEW  
AML system designs  
provide more than 160 channels*

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**NOTES\*:**

- 1) Save cost up to 65% of new equipment.
- 2) Upgrade P.C. boards delivery typically 2 to 4 weeks.
- 3) Plug into existing housings, no additional cable splicing, cable extensions, or cable re-configurations are required.
- 4) Noise figure for Upgrade P.C. boards typically 6dB.
- 5) Most use hybrid IC State-of-the-Art Specifications.
- 6) Exact advantage determined by system configuration.
- 7) Transzorb protection device

- for dc power supply output. Hybrid current requirement 35% less than typical new amplifier.
- 8) Most Upgrade P.C. boards contain surge protectors.
- 9) Extra channels-A prime reason for an amplifier update.
- 10) Upgrade P.C. boards design based on long term observations.
- 11) Familiar amplifier operation results in much less technical retraining.
- 12) One less bill to pay.

**1) COST**

Let the figures speak for themselves when Upgrade P.C. Boards are compared to Manufacture "A", (effective date, January 15, 1981):

MODEL NUMBER (Module Only)	PRICE	UPGRADE (300 MHz Max.)	PRICE	SAVINGS
Trunk ASC/ALC	\$840.00	Upgrade equivalent	\$111.50	87%
Bridger	440.00	Upgrade equivalent	102.00	77%
High Gain Bridger	660.00	Upgrade equivalent	95.00	86%
Trunk	550.00	Upgrade equivalent	107.50	80%
Line Extender	310.00	Upgrade equivalent	145.50	53%
Average savings: 76% using Upgrade P.C. Boards when both product's list prices are compared.				
Price list for Manufacture "B" (effective date, September 1, 1980):				
Trunk/bridger/ALC	\$895.00	Upgrade equivalent	\$323.50	64%
Trunk/bridger	713.00	Upgrade equivalent	268.50	62%
Trunk/ALC	611.00	Upgrade equivalent	190.00	69%
Trunk	388.00	Upgrade equivalent	135.00	65%
Bridger	607.00	Upgrade equivalent	149.70	75%
Line Extender	345.00	Upgrade equivalent	117.00	66%
Average savings: 67% using Upgrade P.C. Boards when both product's list prices are compared.				

- 2) **NORMAL DELIVERY** — Two Weeks or less for P.C. Board suppliers.
- 3) **EASE OF INSTALLATION**

Since Upgrade P.C. boards plug into existing housings, no additional cable splicing, cable extensions, or cable re-configurations are required.

Installing Upgrade P.C. boards does not require relocating existing amplifier housings. Even with super band operation, Upgrade P.C. boards are designed with an improved low noise contribution, plus the extra gain, bandwidth and output level to handle 30 to 35 channels without respacing amplifiers or changing cable. Just plug the modified module in and it works. The proper equalizer may then be selected for more than 21 channel operation, if desired.

Any technician who has installed a mechanically "different" housing at an existing

location is aware of Murphy's Law, "Anything that can go wrong will go wrong." For example, if the feeder cables can be too short to reach the new bridger ports, bet on it. Therefore, extra hours of labor for splicing cables will be required and any cable that has to be relocated will "kink" resulting in cable "breaks" with Rf radiation and water damage at a later date.

Even worse than replacing existing housings would be installing new locations due to respacing. Existing feeder cables will terminate at the original housing and the new housing location will not only require resplicing, but possible redesign of the feeder. Redesign of feeder may cost as much or more than building new plant, due to the cost of existing cable wreckout.

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**Business and Managing Editor**  
 Celeste Rule

**Executive Assistant To The Editor**  
 Diane Howard

**Circulation Manager**  
 Carolyn McCray

**Contributing Editors**  
 S.J. Birkill, Stephen Effros,  
 Ralph Haimowitz

**Art Director/Marketing**  
 Phyllis Crumpler

**Assistant Art Director**  
 Dianna Johnson

**OFFICES**

National Headquarters  
 CATA/CATJ  
 Celeste Rule, Managing Editor  
 4209 N.W. 23rd, Suite 106  
 Oklahoma City, Okla. 73107  
 (405) 947-7664; 947-4717

CATA (Washington Office)  
 Stephen R. Effros, Executive Director  
 3977 Chain Bridge Rd.  
 Fairfax, Va. 22030  
 (703) 691-8875

CATA (Engineering Office)  
 Ralph Haimowitz, Director  
 518 21st Street S.W.  
 Vero Beach, Florida 32960  
 (305) 562-7847

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# Want to Test Your Expertise in Cable Television Technology?

It was suggested that a test be devised to determine basic knowledge of a technician prior to registering for either the Basic or Advanced Technical Training Seminars. In some cases, the material has not been appropriate for the student, so in an effort to assist the cable operators in determining the level of knowledge so that a prudent decision could be made prior to registering, the test on the backside has been devised by CATA's Director of Engineering, Ralph Haimowitz.

This short self-test for cable television technicians has been designed to allow individuals to evaluate their knowledge and training requirements based upon current technical training seminars being conducted by CATA. This has been printed in a manner where it can be removed from the magazine, and copies prepared for multiple testing among your cable system employees.

For your information, **Questions 1, 2, 3, 4, and 9** are a small portion of the information and material given in the **Basic** Technical Training Seminar. Anyone **having difficulties answering two or more** of these questions should consider attending one of the Basic Seminars.

Those who answered all (or almost) of the ten questions should have the required background and knowledge to complete the Advanced Technical Train-

ing successfully. Even if you answered all ten with no difficulty, these represent the **less difficult portions** of the Advanced seminar, which includes CATV formulas, system design concepts, powering, and simulated hands-on cable measurements in the cable laboratory with common equipment used throughout the industry. Therefore, there would still be much to be gained from participating in this Advanced course.

**The answers to this Test will appear in next month's issue of CATJ. Watch for the answers!!**

**Cable operators** — take advantage of this testing to evaluate your technicians. Then consider the appropriate Technical Training for them!! This series will be continued through 1983; the balance of the 1982 schedule is shown below:

BASIC SEMINAR  
HOT SPRINGS, ARKANSAS  
November 1-3  
ADVANCED SEMINAR  
INDIANAPOLIS, INDIANA  
October 4-8  
ORLANDO FLORIDA  
December 6-11

Watch for details on the 1983 schedule!

## Turn This Page!



## A SELF TEST FOR CABLE TELEVISION TECHNICIANS

1. What is the minimum signal level required by the FCC to a subscriber's TV set? \_\_\_\_\_  
\_\_\_\_\_
2. Where should your cable system be grounded?  
\_\_\_\_\_  
\_\_\_\_\_
3. What does dBmV mean? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. At a subscriber's house, you measure +4dBmV of signal and -36 dBmV of noise. What is the carrier-to-noise ratio? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. What is the effect on cross modulation on a cable system with a change of 2dB in signal level? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. + 26dBmV is the equivalent of how many microvolts? \_\_\_\_\_  
\_\_\_\_\_
7. What carrier-to-noise level rating produces an excellent quality picture on a TV set? \_\_\_\_\_
8. What are the FCC requirements for limits in signal leakage from a cable television system? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. How often should you calibrate your signal level meter? \_\_\_\_\_
10. Looking at the video carrier portion of a channel on a spectrum analyzer, you note that the highest visual peak is at 175.26MHz. Other signal peaks are visible at 15KHz intervals to each side of the peak signal and decrease in level as the distance increases from the center frequency of 175.26MHz. An additional visible signal is seen at 175.24MHz. What is the signal at 175.24MHz? \_\_\_\_\_  
\_\_\_\_\_

# When we say fast... we mean **FAST!**

Whatever your CATV operation needs,  
Midwest has it in stock and ready to ship!

Midwest is your best source of supply for everything from an earth-station antenna to a tap ... or whatever you need. For 20 years Midwest has been a CATV products distributor and has grown into one of the nation's largest distributors of the industries finest RF equipment manufacturers. But we're not limited to RF products. We're also the country's top distributor of video equipment and supplies. We can provide you with cameras and recorders for community access, turnkey remote telecast vehicles ... even complete color broadcast facilities! Our services include everything from planning and installation to servicing and training. Best of all, Midwest maintains an extensive inventory of all the leading brands, in-stock and ready to ship within 24 hours. And our prices are competitive with anyone in the business.



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# LETTERS LETTERS LETTERS

Ms. Celeste Rule  
 Managing Editor  
 CATA/CATJ  
 4209 N.W. 23rd, Suite 106  
 Oklahoma City, Oklahoma 73107

Dear Ms. Rule:

I enjoyed the article "The Gravelization of Spinach:" in the July, 1982 issue (volume 9, #7) written by Ken Simons. His first five "myths" are prevalent within the CATV industry. I liked his approach in attempting to explain the dB as I have heard many different explanations of the dB and I have also given many explanations to others in both the technical and non-technical sides of cable.

My only problem is with "myth #6" which reads: "Gain or loss is equal to twenty times the LOG of the voltage ratio". While this statement is incorrect, as Ken Simons states, it is only one half of the formula. I do not understand why the remainder of the formula is discarded as if it did not exist. In the article it states the LOSS =  $10 \text{ LOG } \frac{P_{\text{out}}}{P_{\text{in}}}$  dB; and this is correct. Also,

$$P_{\text{in}} = \frac{V^2_{\text{in}}}{R_{\text{in}}} \text{ and } P_{\text{out}} = \frac{V^2_{\text{out}}}{R_{\text{out}}}$$

If the values are substituted in the "loss" expression, the result is:

$$\text{LOSS} = 10 \text{ LOG} \left( \frac{V^2_{\text{in}} \times R_{\text{out}}}{R_{\text{in}} \times V^2_{\text{out}}} \right) \text{ dB}$$

If  $R_{\text{in}} = R_{\text{out}}$ , he states that this is the only time that "myth #6" is correct. As far as "myth #6" is concerned, this is a correct statement

but I would like to carry this dB problem somewhat further and try his example with the complete formula. If loss in dB equals  $10 \text{ LOG } \frac{P_{\text{in}}}{P_{\text{out}}}$  then:

$$\text{dB} = 10 \text{ LOG } \frac{P_{\text{in}}}{P_{\text{out}}} \text{ which } =$$

$$10 \text{ LOG} \left( \frac{V^2_{\text{in}} \times R_{\text{out}}}{R_{\text{in}} \times V^2_{\text{out}}} \right)$$

This can be arranged as:

$$\text{dB} = 10 \text{ LOG} \left( \frac{V^2_{\text{in}} \times R_{\text{out}}}{V^2_{\text{out}} \times R_{\text{in}}} \right)$$

As previously stated, Mr. Simons makes mention that two quantities multiplied together could be added if the LOG of each was taken first. Therefore:

$$\text{dB} = 10 \text{ LOG} \left( \frac{V^2_{\text{in}} \times R_{\text{out}}}{V^2_{\text{out}} \times R_{\text{in}}} \right) =$$

$$10 \text{ LOG} \frac{V^2_{\text{in}}}{V^2_{\text{out}}} + 10 \text{ LOG} \frac{R_{\text{out}}}{R_{\text{in}}}$$

He also states that due to a principle of logarithms that:  $\text{LOG } X^2 = 2 \text{ LOG } X$  then I can state:

$$\text{dB} = 2 \times 10 \text{ LOG} \frac{V_{\text{in}}}{V_{\text{out}}} + 10 \text{ LOG} \frac{R_{\text{out}}}{R_{\text{in}}}$$

This is the complete formula that should be used:

$$\text{dB} = 20 \text{ LOG} \frac{V_{\text{in}}}{V_{\text{out}}} + 10 \text{ LOG} \frac{R_{\text{out}}}{R_{\text{in}}}$$

Just to finish, I would like to consider his problem of the audio amplifier using the complete formula.

The problem was an audio amplifier with an input resistance of one megohm which requires an input voltage of 10 millivolts to put out a power of 20 watts into an 8 ohm loudspeaker. What is its gain expressed in dB? He said if his calculator was working correctly, 10 times the LOG of the power ratio is 103 dB. Unfortunately, his calculator seems to be in error as I arrived at 113 dB. Of course, my calculator could be in error as well.

If the input voltage of 10

millivolts was a misprint and it should have been 100 millivolts and also that one megohm input should have been 10 megohm then I would agree that 103 dB would be the correct answer. The next statement is that 10 times this LOG of the voltage ratio is 42 and he refused to say dB which is correct but let us add  $10 \text{ LOG} \frac{R_{\text{in}}}{R_{\text{out}}} =$

$$10 \text{ LOG} \frac{10 \text{ Mohm}}{8 \text{ ohm}} = 61 + 42 = 103 \text{ which is dB.}$$

Next is 20 times the LOG of the current ratio reported at 144 which I arrive at 164, this is not dB. Using the rest of the formula add:

$$10 \text{ LOG} \frac{R_{\text{out}}}{R_{\text{in}}} = 10 \text{ LOG} \frac{8 \text{ ohm}}{10 \text{ Mohm}} = -61 + \text{the } 164 = 103 \text{ dB.}$$

In all three uses, I arrive at 103 dB for the gain of the audio amplifier.

I am glad he rests his case and now if he would pick it up to complete the mathematics everyone would understand that no matter how dB is calculated, the results will be the same.

The formulas are as follows for gain:

$$\text{dB} = 10 \text{ LOG} \frac{P_{\text{out}}}{P_{\text{in}}}$$

$$\text{dB} = 20 \text{ LOG} \frac{V_{\text{out}}}{V_{\text{in}}} + 10 \text{ LOG} \frac{R_{\text{in}}}{R_{\text{out}}}$$

$$\text{dB} = 20 \text{ LOG} \frac{I_{\text{out}}}{I_{\text{in}}} + 10 \text{ LOG} \frac{R_{\text{out}}}{R_{\text{in}}}$$

Where: V = Voltage, I = Current,  
 R = Resistance, P = Power

I have read your magazine for many years now and enjoy it a great deal. I thought you would have interest in the remainder of the "story" on dB calculation.

Very truly yours,

Charles W. Gentry  
 Division Engineer  
 Times Mirror Cable Television, Inc.

Ms. Celeste Rule  
 CATA  
 4209 NW 23rd Street  
 Suite 106  
 Oklahoma City, OK. 73107

Dear Celeste:

I certainly enjoyed the CATA convention in Nashville. It was my first and its plain to see that you and Steve Effros have a winner on your hands. I especially like the concept of serving the lunches in the exhibit area which brought all of the system operators to the vendors. Sincerely,

Mark Thayer  
 National Cable Executive

Ms. Celeste Rule  
 CATA  
 4209 NW 23rd Street  
 Suite 106  
 Oklahoma City, OK. 73107

Dear Celeste:

On behalf of the entire Group W Satellite Communications organization, we would like to extend our congratulations on a job well done at the 1982 CATA Convention in Nashville.

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Again, your hard work showed and Group W Satellite Communications is proud to be a part of the CATA Association. We look forward to working with you in the future. Should you need help in any way please don't hesitate to give us a call.

Sincerely,

Tom Hawley  
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4) **NOISE FIGURE**

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5) **STATE OF THE ART SPECIFICATIONS**

Upgrade P.C. board use the same hybrids as the other leading CATV manufacturers. Other than engineering to incorporate the hybrid into an amplifier design, specifications between the top manufacturers are very similar.

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**SPECIFICATIONS**

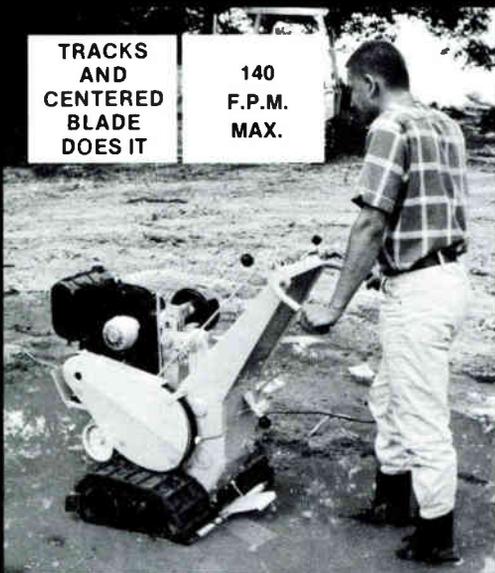
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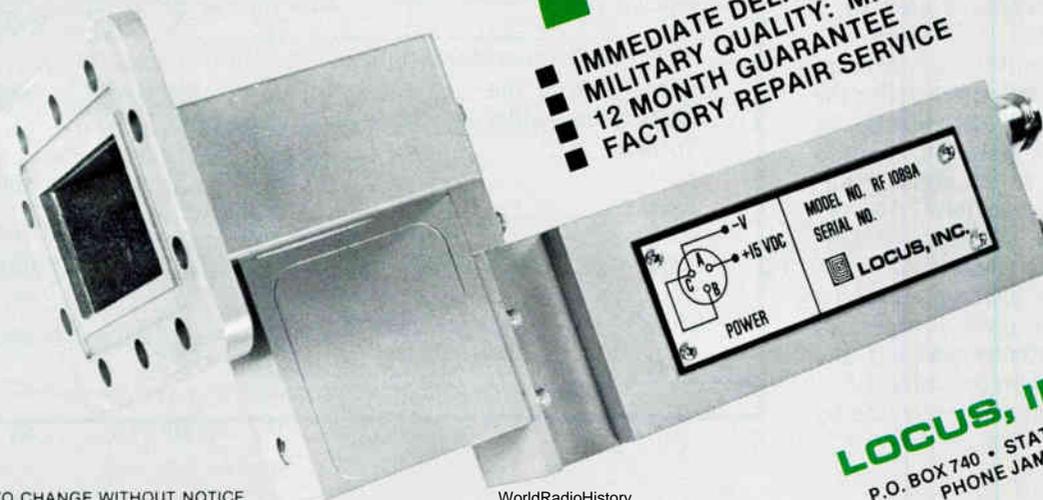
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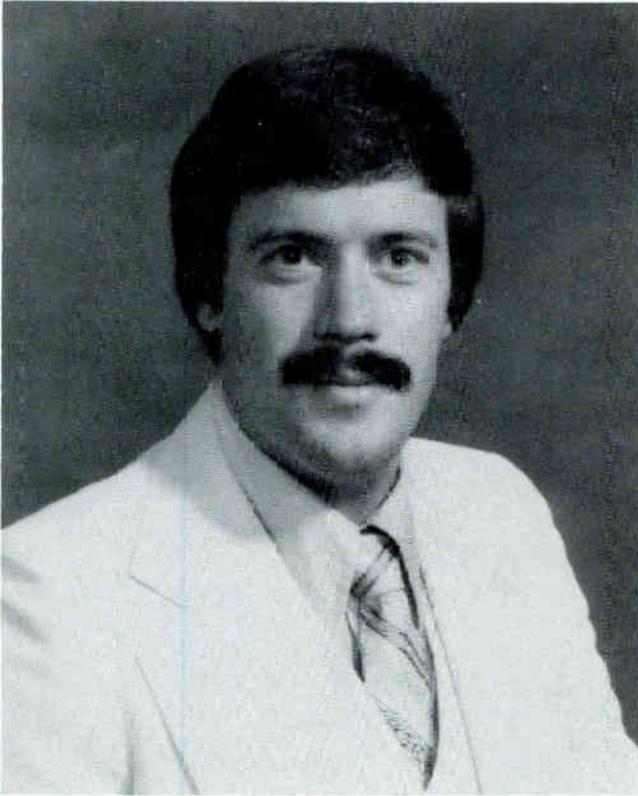
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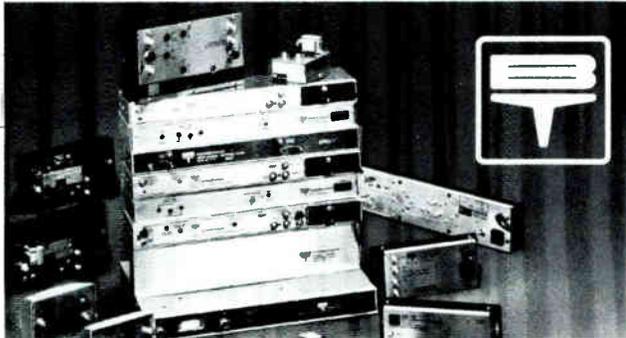
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Fred Rogers

*No newcomer to CATA or CATJ, Fred Rogers has been a popular contributor to the annual CCOS program, as well as to technical material presented in CATJ. For some of you who may be new readers, Fred Rogers is well known as a field engineer, having worked as a consulting engineer for several years and then as General Manager of Broadband Engineering. Two years ago, he formed Quality RF Services, a company dedicated to supplying CATV replacement components, products, and repair services. The majority of his time is spent in the field, and his expertise is acknowledged widely in the cable field. CATJ is most appreciative to Fred for his efforts on the presentation on Increasing Channel Capacity.*

*The name of Whitaker too is no newcomer to the cable industry, Steve Whitaker is a technician for Cable TV Services in Garland, Texas. Many of you may know that Steve is Art Whitaker's son; at present, Steve is continuing his formal education towards a Business degree and aspires to be a writer. His cooperation with Fred on this technical material is most appreciated, and we wish him success in his coming projects.*



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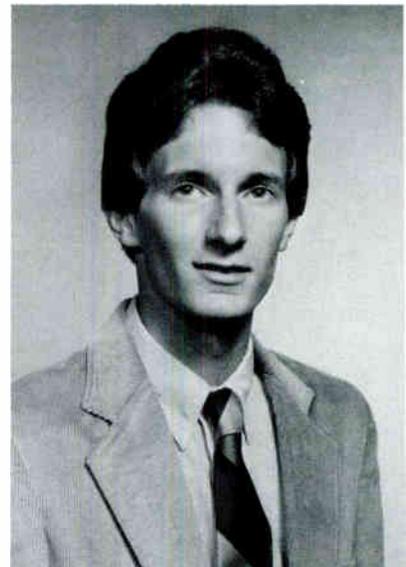
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Steve Whitaker



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# Haimo Wits

RALPH HAIMOWITZ, CATA'S DIRECTOR OF ENGINEERING

Another year and another CCOS behind us, and what a great annual convention it was. Needless to say, we look forward to each and every CCOS for the reunions with old and dear friends, as well as the opportunity to meet many new ones. I know that CATJ has covered the convention in thorough detail, but I have to comment on some of the highlights and sidelights that occurred. None of us will forget the outstanding day in Opryland Theme Park — a great way to spend the 4th of July. Although we were only able to get to two of the shows, Showboat and I Hear America Singing, I heard from everyone who saw the others that they were all outstanding.

The Opryland Hotel proved to be an ideal facility for a CATA convention. The hotel staff certainly had it all together and took a lot of the pressure off the CATA staff because of their efficiency. How about that Sunday Buffet Brunch? In all my travels, I have never seen anything quite that spectacular. There were so many things for everyone to see and do that there just did not seem to be enough hours in the day to get around to them all. What with the Grand Old Opry, The Welcoming Reception by Group W Satellite Communications which had cookies and ice cream for the youngsters (a superb idea that I have never seen before at a cable show), Opryland Park, HBO's Hoedown, and Bill Anderson and the Po-Folks entertaining at the banquet (also provided by Group W), there could be no doubts that CCOS-82 was a great family cable show.

Typically, the high point of CCOS was the seminar schedule, and Monday and Tuesday were filled with Management and Technical programs. This year we tried something different and only ran each seminar one time except for Raleigh Stelle's spectrum analyzer lab. The consensus of those who attended was that this worked out great as long as the sessions they could not get to had audio tapes available. If you missed a particular session of interest or were not able to come to CCOS-82, you can still get the audio cassettes of the sessions from Personalized Cassette Service, 5600 Brookwood Terrace, Nashville, Tn. 37205, Phone: (615) 356-4240. CATJ has covered these seminars in detail so I won't do a recap of them here, but I do want to thank each and every person who participated in the seminar presentations.

These folks willingly give their time and efforts to make CCOS the best cable meeting in the industry, and they certainly deserve our plaudits and appreciation. It is our seminars, after all, that make CCOS a successful learning and working convention.

Let's not forget the Exhibit Hall. For the first time in CATA's history, we had an exhibit hall that provided enough space, with excellent facilities and lighting, to make the exhibits attractive and interesting. Almost everyone I talked to felt it was perfect: not too big, not too small, not too flashy, not too conservative, and just the right number of hours. I was very pleased to learn that the CATA system operators showed their appreciation toward our exhibiting Associates by bringing their check books with

them and signing contracts in the Exhibit Hall. This is the best way that we can let the Associates know how much their support means to all of us.

Last, but by no means least, there are some specific people and companies that I want to express my thanks to for all that they did to make the convention work. Gold Star and Blue Ribbon awards to:

1. Dave Embersen and Triple Crown Electronics for the headend that supplied signals to the hotel system and exhibit hall.
2. Ivan Jones and Klungness Electronics Supply for providing the satellite antenna feed from SATCOM III R to the hotel headend system.
3. McCullough Satellite for the satellite antenna feeds for the exhibit hall. CCOS-82 was the first cable convention to provide live signals for CBS Cable, Cable Health Network, The Satellite News Channel, and The Entertainment Channel.
4. Klungness Electronic Supply, The Drop Shop, Times Wire and Cable, and Comm/Scope Corp. for providing the materials to provide signals to the exhibit hall.
5. Wayne Sheldon, Kurt Bestor, and Ed Smith for helping to put it all together and keep it working.
6. David and Mildred "Little Bit" Fox for selecting Opryland for CCOS-82 and the superb job they did in hosting the convention.

Thanks a bunch, gang, for a great job! □

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By: Ralph A. Haimowitz, Director  
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# How Do You Like Your Satellite Signals?

## SCRAMBLED!

Home Box Office held an informal breakfast meeting for attendees of the Florida Cable Television Association to inform them of HBO's forthcoming plans to secure their satellite signals in late 1982 or early 1983. Bob Zitter, Director of Network Operations, explained that HBO will begin providing affiliates with detailed information on their signal security system this coming fall, and he specifically stressed the rigid technical standards that HBO will require for the system to reduce failure probability of the equipment to the lowest possible levels, "far less than equipment failures of satellite receivers and LNA's".

The present plan is to begin the scrambling program with HBO West satellite feed and, when this system is in complete, successful operation they will scramble the HBO East feed. Mr. Zitter was quick to point out that the next step for HBO was to select the equipment that will be used for **encoding** and **decoding** the satellite signals. Selection has not been made as yet from the various product manufacturers who are currently designing and testing equipment to meet HBO's needs. Some of the

technological details of the "black box" decoder are based upon using digital audio signals for transmission which will permit total removal of the audio signal without the use of the decoder. Use of digital audio transmission will also permit HBO to provide additional future service such as FM stereo signals. There will also be video scrambling of HBO's satellite signals with the decoders responding to an encoded signal that changes codes in timed sequences somewhere between 30 minute intervals down to as often as every minute, and will be based upon the National Bureau of Standards encryption techniques.

Several affiliates in attendance expressed concern about the decoders which are being estimated to cost in the \$1500.00 range. Zitter said that HBO plans to provide one decoder to each current affiliate headend carrying their programming, while new affiliates signed after scrambling begins will probably have to purchase their own decoding equipment. The present spare equipment program being considered is to have replacement decoders located where almost any system that experiences a

failure would have a replacement in their hands within a maximum six hour time period.

Affiliates were quick to point out that a six hour outage on a premium cable channel such as HBO is totally unacceptable to the cable operators and subscribers. It is also a certainty that no matter how well the decoder is made that equipment failures are inevitable — if power surges or component failures do not cause the decoder to fail, Murphy's Law will. The solution to this problem appears to be that the smart cable operator will purchase a second unit for backup.

There is also some concern that the decoder will be easily duplicated, producing "black market" units for home satellite earth station and SMATV system users unless strong, federal legislation is passed making it illegal for the unauthorized sale, manufacture, and possession of such decoders.

Another area of concern is what will the other satellite services do. It seems likely that all of those whose programming is under a **pay-for-reception** contract will have to provide security for their signals, particularly the other premium channels. Operators are concerned about having a different decoder for each of these services that they carry on their cable systems which would increase the numerical probability of equipment failures and require a complete spare for each service. Home Box Office has suggested to the manufacturers currently testing satellite security devices that the equipment they select is not intended for the exclusive use of HBO. Ideally, each of the services will use a compatible type of security system where the basic decoder will work for one or more services by the addition of plug-in modular cards. Unless the cable industry takes a firm position on equipment standardization, this is not likely to happen, and the burden of owning and maintaining a multitude of decoding equipment will fall upon the cable operator.

Regardless of the questions raised or potential problem areas that need to be resolved, there is no question that the need for securing satellite television signals is upon us. □

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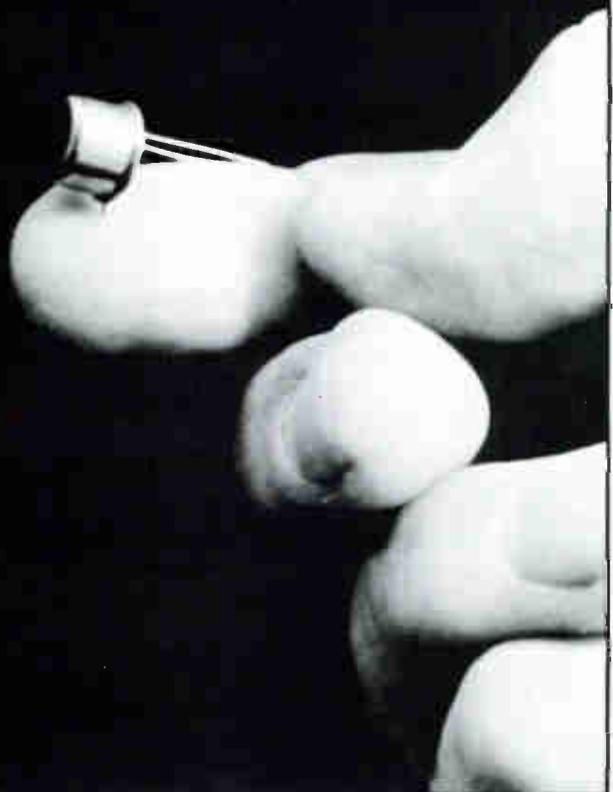
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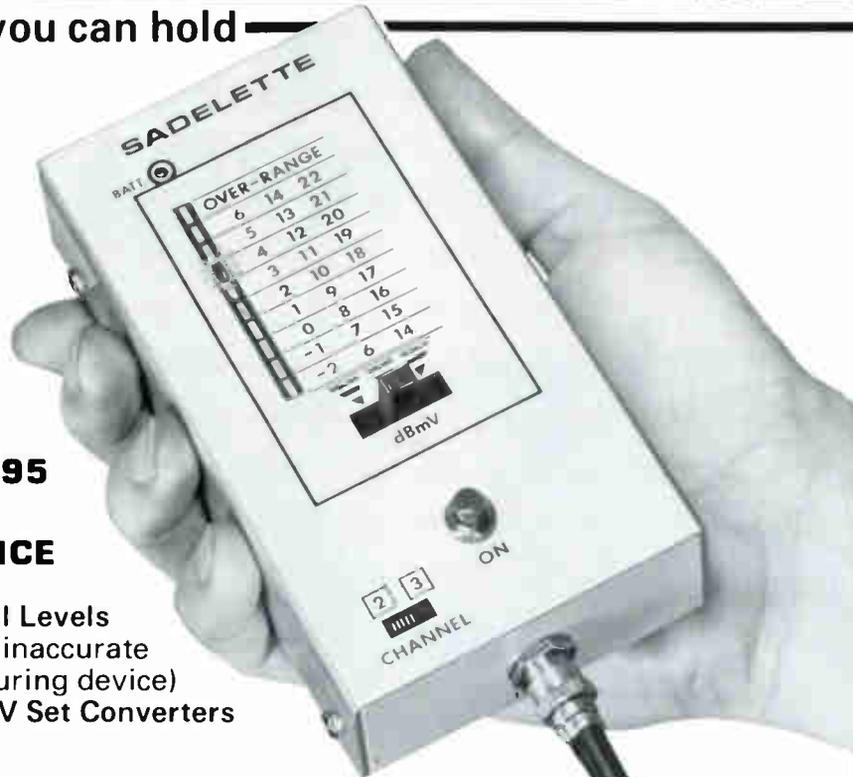
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I had the pleasure of representing CATJ and CATA at a Hughes Communications demonstration on July 23. This demonstration showed how an existing TVRO antenna can receive signals from two satellites — Satcom III-R and Galaxy I — simultaneously. By replacing the present single feed system of an existing antenna with a new dual beam feed system, a cable operator will be able to double the amount of programming received while reducing substantially the expenditures necessary to buy a new antenna.

“We are pleased to offer this technology to the cable industry,” said Clay T. Whitehead, president of Hughes Communications. “It is our hope that this demonstration will spur the development of dual beam modification kits as part of antenna manufacturer’s product lines so that a significant number of modified antennas will be in place by the launch of Hughes Communications’ Galaxy I next June.”

The Galaxy I satellite will transmit 24 channels of programming from Time Inc., Turner Broadcasting, Westinghouse Broadcasting Company Inc., Times Mirror Satellite Programming, Viacom International, Inc., SIN Television Network, C-SPAN and others yet to be announced.

Technical representatives from major MSOs, antenna manufacturers, CATA, NCTA, Galaxy I programmers and the trade press met at the Hughes facility in Torrance, California, for the demonstration. Mr. Whitehead welcomed the participants and introduced the modification.

According to Mr. Whitehead, the modification was developed by Hughes Aircraft ten years ago. However, it was not until the FCC assigned two major cable satellites, Galaxy I and Satcom III-R, adjacent orbital slots at 135°W and 131°W longitude, that the perfect application was created.

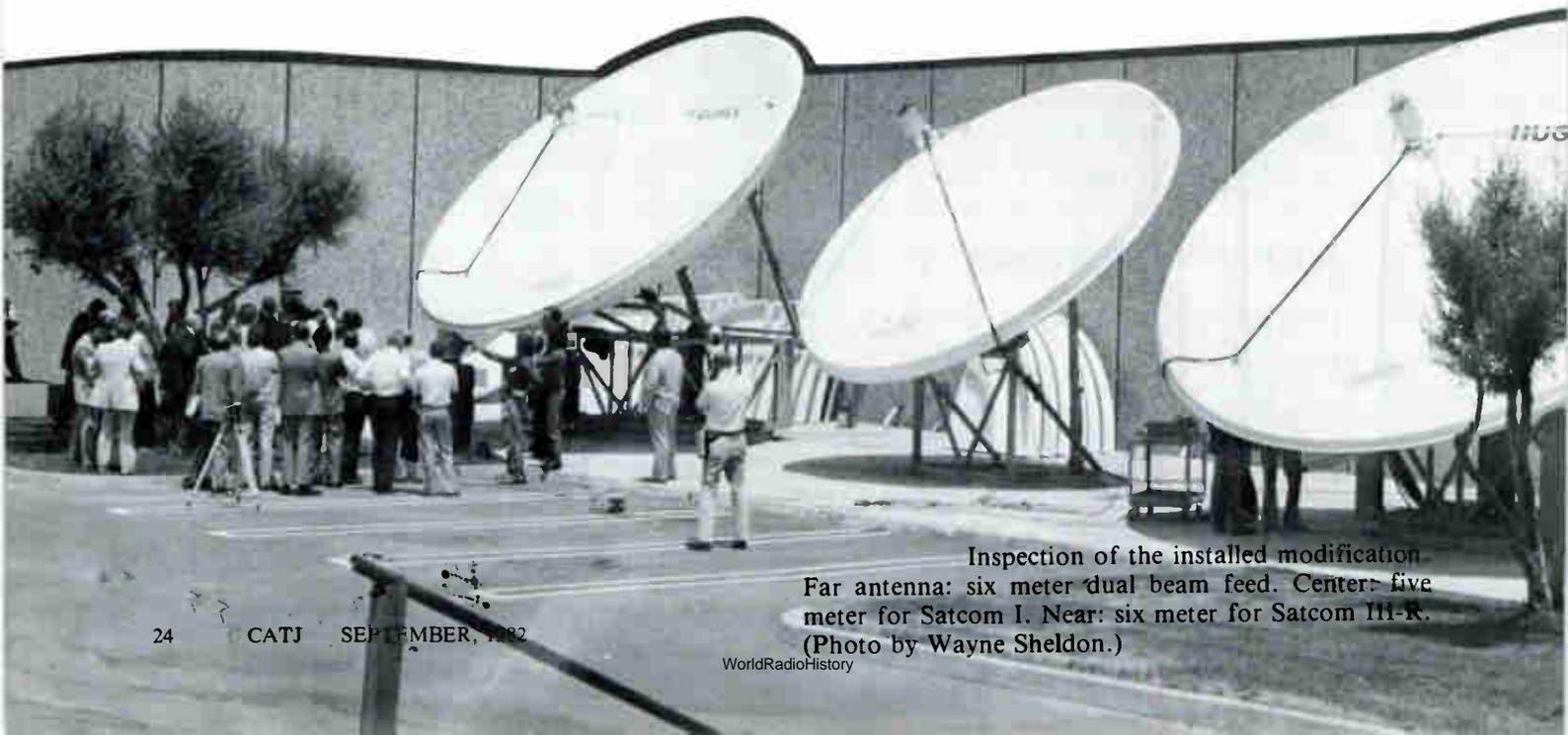
In 1983 there will be up to 48 channels of cable programming available on these two satellites. Cable operators with the modification will be able to receive all these channels. Since Galaxy I and Satcom III-R are only 4° apart, there will be an imperceptible increase in the signal to noise ratio of less than 0.5 db. Such differences are so small they are difficult to measure and virtually impossible to see in a TV picture.

Participants at the demonstration tested the signal to noise ratio and viewed the quality of signals received from two satellites via a modified antenna. Signals from Satcom I which still had two channels of video were used for the test. Galaxy I will be placed in this same position next June after Satcom I is deactivated completely.

The concept of the modification is not complex. Signals from two adjacent satellites (from 3° to 5° apart) are received along two separate beams and are then reflected off the parabolic surface of the antenna up to the dual beam feed system. The feed system is suspended from an adjustable support structure so that a cable operator can direct the antenna to two adjacent C-band satellites in the geostationary arc and adjust for different geographic locations. This is an innovative and highly cost effective method of doubling the receptive

# DUAL BEAM MODIFICATION

By Wayne Sheldon, Director  
CATA District #7  
San Jose, California



Inspection of the installed modification.  
Far antenna: six meter dual beam feed. Center: five meter for Satcom I. Near: six meter for Satcom III-R.  
(Photo by Wayne Sheldon.)

capacity of existing parabolic reflector antennas, namely the on-site replacement of their feeds with a new system that will enable them to receive simultaneous transmissions from adjacent satellites in geosynchronous orbit.

The principle of this new feed system is not new to the antenna art. The earliest radar sets used in World War II used mechanical scanners to rotate a beam around the boresight axis of a parabolic dish. Subsequent development has led to highly refined methods of producing multiple beams and of scanning these beams from reflectors and primary arrays electronically.

The following technical information and example were furnished by Mr. Norman P. Weinhouse, the manager of systems engineering and planning of Hughes Communications.

The feed system proposed here utilizes a limited offset from the paraboloid focal point to restrict the range between beams to less than  $5^\circ$  ( $\pm 2.5^\circ$  from boresight) and

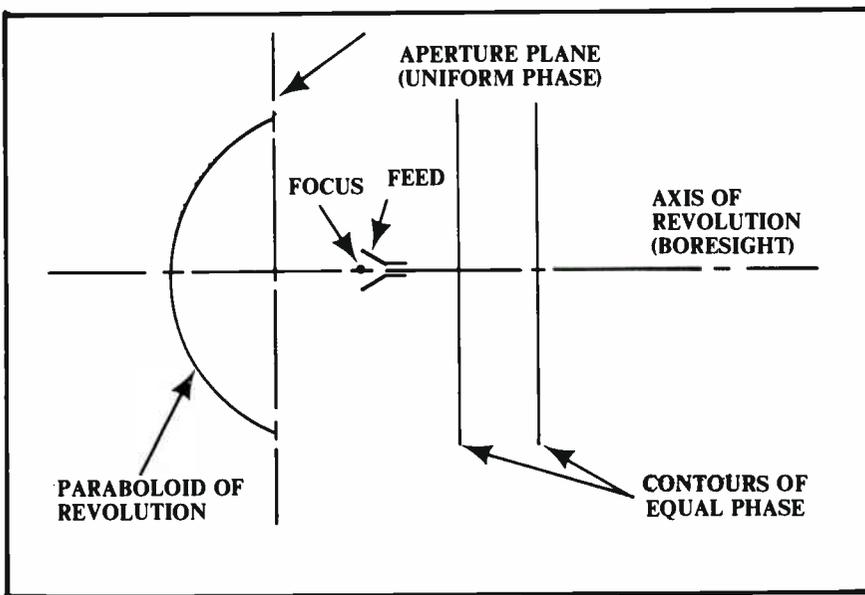
maintain high efficiency. The method of scanning employed, as well as the feed geometry, are described in detail.

### SCANNING

Figure 1 illustrates the most prevalent feed system design, in which the phase center of the feed is at the focus of a paraboloid reflector. In this design, the r.f. phase over the aperture plane of the reflector is uniform, and in transmission a wave is launched with uniform phase normal to the boresight of the reflector. This produces a beam whose maximum amplitude is on the boresight.

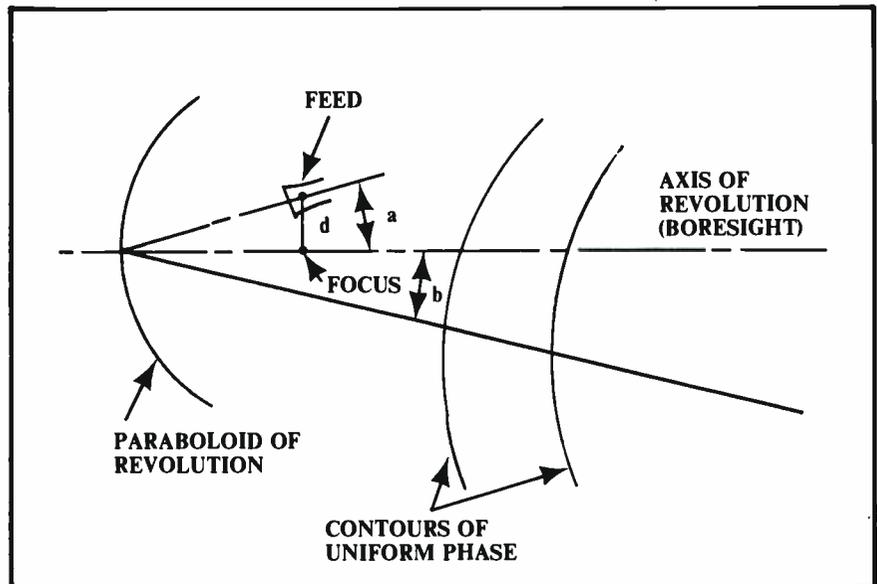
Figure 2 illustrates the proposed dual beam feed system design, in which the phase center of the feed is displaced a distance (d) from the focus, producing an angle (a) between the boresight axis and the feed center of phase. The resulting phase across the aperture is no longer uniform. Instead of uniform phase normal to the

*continued on page 38*

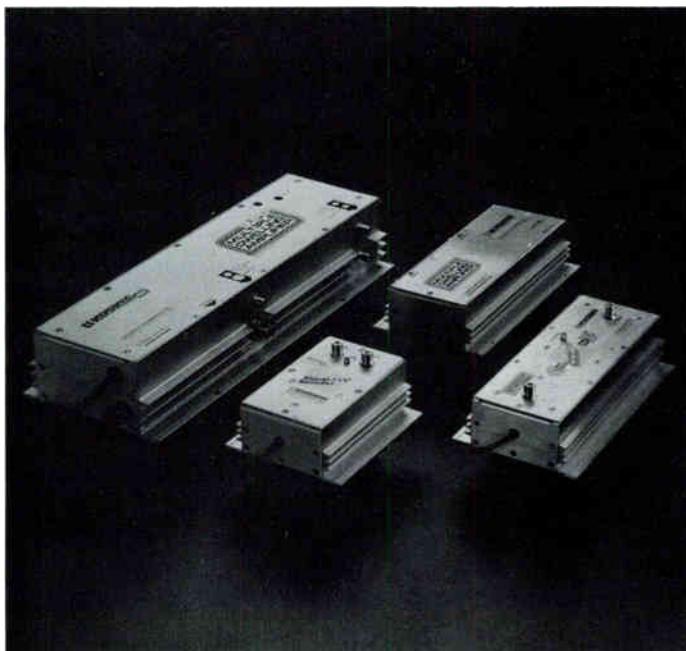


**FIGURE 1. PARABOLIC ANTENNA, FEED AT FOCUS**

**FIGURE 2. PARABOLIC ANTENNA, FEED DISPLACED FROM FOCUS**



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In response to Mr. Birkill's update in the August issue of CATJ concerning his delay in coming to the United States and possible change in plans altogether, his readers have expressed their concern about his disappointment with the delay and his subsequent and well-being.

To update those newer readers of CATJ, Mr. Birkill has been writing for us since October, 1978, after a visit to this country as a guest of CATA for CCOS '78. Those of you may remember that this was the year the uplink was accomplished for transmission of the sessions on site from Fountainhead Lodge on Lake Eufaula, Oklahoma.

Mr. Birkill's intention upon the onset of his articles was for exchange of information as the geostationary communications satellites came alive. His area on Experimental Earth Terminals has provided material for the exchange of facts, ideas, and experiences about equipment, program materials, and the advance of the satellites and has proved to be some of the most requested material presented in CATJ.

# S.J. BIRKILL ON EXPERIMENTAL TERMINALS

Mr. Birkill's first encounter with real satellite TV signals came in late 1975, when NASA's ATS-7 satellite was in the middle of its SITE, beaming educational programming to India. With his equipment in Northern England some 10° off boresight, he could expect to be down in signal level compared with the Indian SubContinent. This aroused his interest in researching the situation and resulted in pictures by December 1975. And the advance of his work took on TVRO technology on a world-wide basis. As a Senior transmitter for the BBC, his work was extremely demanding and fruitful, yet it afforded him the opportunity to pursue his experimental work to the point where few in the CATV terminal industry can equal his creativity of hardware and electronic circuits. This was the reason he was invited to CCOS '78 and to participate in regular articles in CATJ, an activity we are pleased to say he has continued since October 1978.

On behalf of the readers and their response, we would like to encourage Mr. Birkill in his future pursuits and extend our appreciation for the tremendous amount of information he has shared with our CATJ readers. You can be assured that Mr. Birkill will continue to be represented each month and to him, we would like to extend our best wishes for happy resolution to the dilemma at hand. We'll keep you posted as well.

article begins on page 30

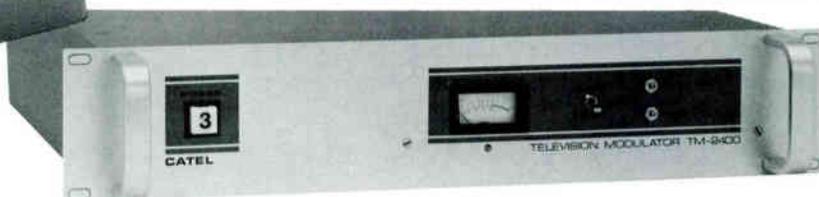


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We reported on Canada's Ku-Band satellite program in this column as long ago as January 1981. Since then a few changes have been made in Telesat's plans, and with the first Anik C bird due to fly in November, it seems opportune to review the situation.

The most significant change will be immediately apparent if you

compare the footprint patterns shown here to those first published. The beam shapes remain much the same, but the boresight has been shifted south and west of its original position. So what was a series of beams covering Canada's major population centers, now illuminates primarily the northern United

States, from Washington state to New England and extending southwards as far as northern California, Denver Colorado, Tennessee and North Carolina. Almost the entire northern half of the United States is due to receive a minimum of 47 dBW EIRP from the four primary spot beams, while the secondary service area resulting from the combination of the eastern and western pairs of beams is now defined out to the 31 dBW contour, and takes in the remainder of the continental U.S. with the exception of Texas, Florida and the extreme southerly regions of California, Arizona, New Mexico and Louisiana. Also in this portion of the footprint are those parts of Canada originally planned for 47 dBW service.

This re-aiming of the satellite antenna will in fact be accomplished by relocating the transmitting ground station for the tracking beacon used by the spacecraft as its boresighting reference. By deactivating the beacon transmitter at Telesat's control center at Allen Park, Ontario, and energizing a new beacon transmitter on United States territory, Telesat Canada will cause the satellite antenna to 'nod' southwestwards by a little over half a degree.

But since when has Telesat Canada been in the business of providing satellite communications to the U.S.A.? In fact, and despite regulatory problems, US/Canada co-operation goes back quite a few years in the field. The 12 GHz Communications Technology Satellite, Hermes, was a joint US/Canadian experiment, and RCA has long had an agreement with Telesat to use an Anik bird for restoration of cable services in the event of a Satcom failure. Telecommunications policies have traditionally been different across the border, with Canada favoring tighter regulation and fearing cultural domination.

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Letters of Agreement were exchanged in 1972 between the two governments, permitting the sharing of transponder capacity in both directions in the event of one country's shortage coinciding with the other's spare capacity. A condition of the agreement was that any satellite signal be used only in its country of origin, and that each case be approved by both countries' regulatory bodies (the FCC and the CRTC.).

With their plans well advanced for the Ku-Band (12 GHz downlink) Anik C series and the C-Band Anik D, Canada found itself with rather more transponders than it would be able to fill in the short term. At the same time the US demand for space segment was still exceeding the supply, and a new phenomenon had emerged — the American company anxious to be first up with a DBS-style package in the 12 GHz band. GSat (GTE Satellite Corporation) will fly its own Ku-Band satellites beginning in 1984, but wants an immediate presence for its clients Pop Satellite Inc. and Allstar Satellite Network Inc. of New York, to deliver a selection of broadcast, Pay-TV and cable services to American users including SMATV systems. Oak Satellite Corporation, a subsidiary of scrambling system manufacturers Oak Industries, is entering the DBS race with its own 12 GHz bird tentatively planned for 1986, but wants to expand its existing terrestrial STV service by adding satellite delivery in 1983. Both would employ scrambling.

Then there was Argo, with plans for a TDMA network, SBS-style, but using six C-Band (4 GHz) transponders. A block of six channels was difficult for the US domsats to provide, so agreement was reached with Telesat Canada, and duly approved by FCC and CRTC, for Argo to lease six transponders on Anik D-1, due to fly this August, on a pre-emptible basis. Other U.S.

users of Anik-D C-Band capacity are expected to emerge.

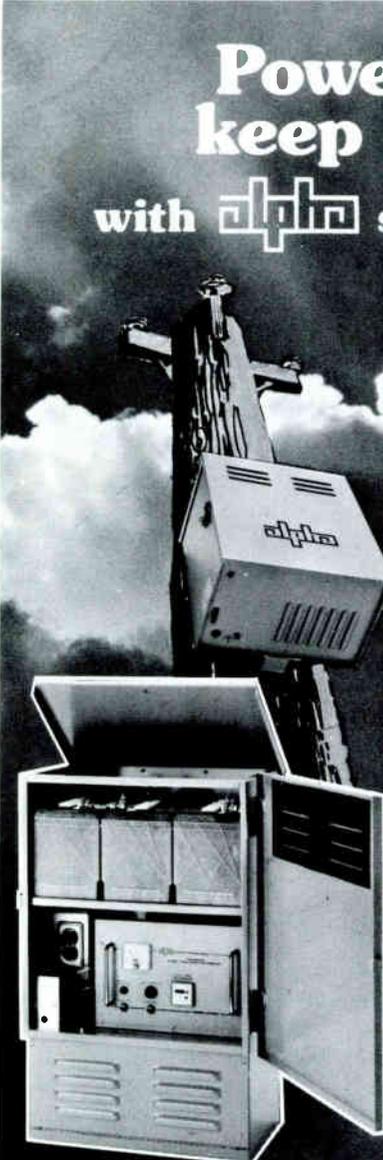
As for Ku-Band, the initial proposal was for GSat to take ten transponders on the first Anik C (now expected to be C-3) whose shuttle launch is scheduled for November this year, and for Oak's four channels to fly on Anik C-2 in

April 1983. This would have meant applying the southwesterly antenna tilt to both birds, placing Canadian users at a disadvantage. In particular, Canadian cable and 'interim DBS' operators opposed the plan, and Telesat had to consider moving the GSat service to the C-2 bird or

*continued*

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losing regulatory approval. As it happened, GSat themselves chose to delay the start of their service to June 1983, which meant that the transfer to C-2 was agreeable to all concerned. So at the time of writing it appears that C-3 will be Shuttle launched mid-November (along with SBS-3), and enter service

around the New Year, most probably with the original 'north-border' boresight as shown in CATJ January 1981. Then Anik C-2 will take to the sky in April 1983 and provide the US services with the footprints shown here, by mid-June. The third Anik C, C-1, is due for launch in April 1984. By that

time several new US domsats will be entering service and C-1 is expected to be aimed towards Canada.

All of the Anik C and D birds are based on the Hughes HS-376 design of dual spin-stabilized spacecraft with pop-up 'lid' antenna reflector and telescopically deployable solar array skirt. Spar Aerospace Ltd of Canada is subcontractor (to Hughes) for Anik C and main contractor for Anik D. The C-3 satellite will be stationed at 112.5°W. C-2 and C-1 will follow at 116°W and 109°W (the present home of the hybrid Anik B) respectively.

Looking at the footprint patterns here, with due regard to satellite antenna gain and TWTA power, the 47 dBW primary service contour would seem to be rather conservative, by as much as 3 dB. Using full-transponder power in a standard 36 MHz TV channel (transponder usable bandwidth is 54 MHz), and with that power feeding a single spot beam, beam center EIRP could be expected to exceed 53 dBW. In this mode an antenna of less than one meter aperture could provide adequate DBS reception at beam center. In the anticipated 'combined-beams' mode EIRP is reduced by some 3 dB, requiring the more familiar interim-DBS TVRO antenna size of 1.5 to 1.8 meters. The subject of fade margins against rain attenuation was discussed at some length in the earlier article. This consideration requires cable and rebroadcast TVROs to specify a higher G/T than the private user, typically in the 3 to 4.5 meter range.

#### MEXICO

Intelsat watchers will be interested to discover that the new Intelsat Central American lease slot at 53°W, mentioned some months ago, is now active with as many as three channels of Mexican TV. Intelsat IV F3 was moved to 53°W during 1981, and was joined during April 1982 by Intelsat IV F7, fresh from a quiet life as Pacific spare bird. Services were transferred to



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the newer bird, which is able to maintain its orbital inclination (hence north-south stationkeeping) to around the  $0.1^\circ$  figure required for domestic service, and F3 may be held as a spare although its eastward drift to  $50^\circ\text{W}$  appears unchecked at the time of writing, and it may be bound elsewhere. The older Intelsat IV satellites are feeling a bit spare of recent days, with the continuing Intelsat V launches and utilization of Intelsat IVA birds in the Atlantic Major Path and African/Middle Eastern domestic lease positions. But alone the Intelsat IV satellites can deliver the 4.5 degree spot beams, capable of placing a peak EIRP of 37 dBW into their bore-sight regions. This is the antenna pattern adopted for the Australian and Mexican leases, and apart from the absence of beam shaping it is a healthy substitute for a dedicated domestic satellite in those contries.

The  $53^\circ\text{W}$  slot is visible from here in the U.K., but with the westerly spot beam in use the signals here are below the level of the telemetry beacons, and only just detectable by spectrum analyzer on my home 8-foot TVRO. A report from Tennessee details US network affiliates in California seen in addition to the three Mexican channels, and estimates EIRP values in the region of 29-30 dBW. This seems a little low to me if the Mexicans are employing saturated full-transponder TV, though I have no information on the beam's bore-sight. Any other reports on the Mexican leases would be welcomed (program/transponder/estimated EIRP).

#### ARGENTINA

Another interesting full-time domestic lease is that of Argentina. This is on global transponder 12 (24 on a US receiver) on the Atlantic Primary Reserve, Intelsat V F2, located over  $27.5^\circ\text{W}$ , and as such is a good signal here as well as in the

eastern USA. Intelsat V global beam-edge is a nominal 23.5 dBW and the full-transponder occupancy makes it a better target than the half-transponder 'occasional' (it's almost continuous!) transatlantic TV on the primary bird's transponder 12.

Argentina uses the 'odd-ball' TV standard PAL-N, where the video is

625 lines, 50 fields/sec but with 3.58 MHz chroma, NTSC's subcarrier frequency but coded according to the PAL system. So even my quad-standard international TV monitor can't resolve color! Audio is much easier though, on 6.4 MHz sub-carrier. The service is uplinked from Balcarce III, close to Mar del Plata.

*continued on page 36*

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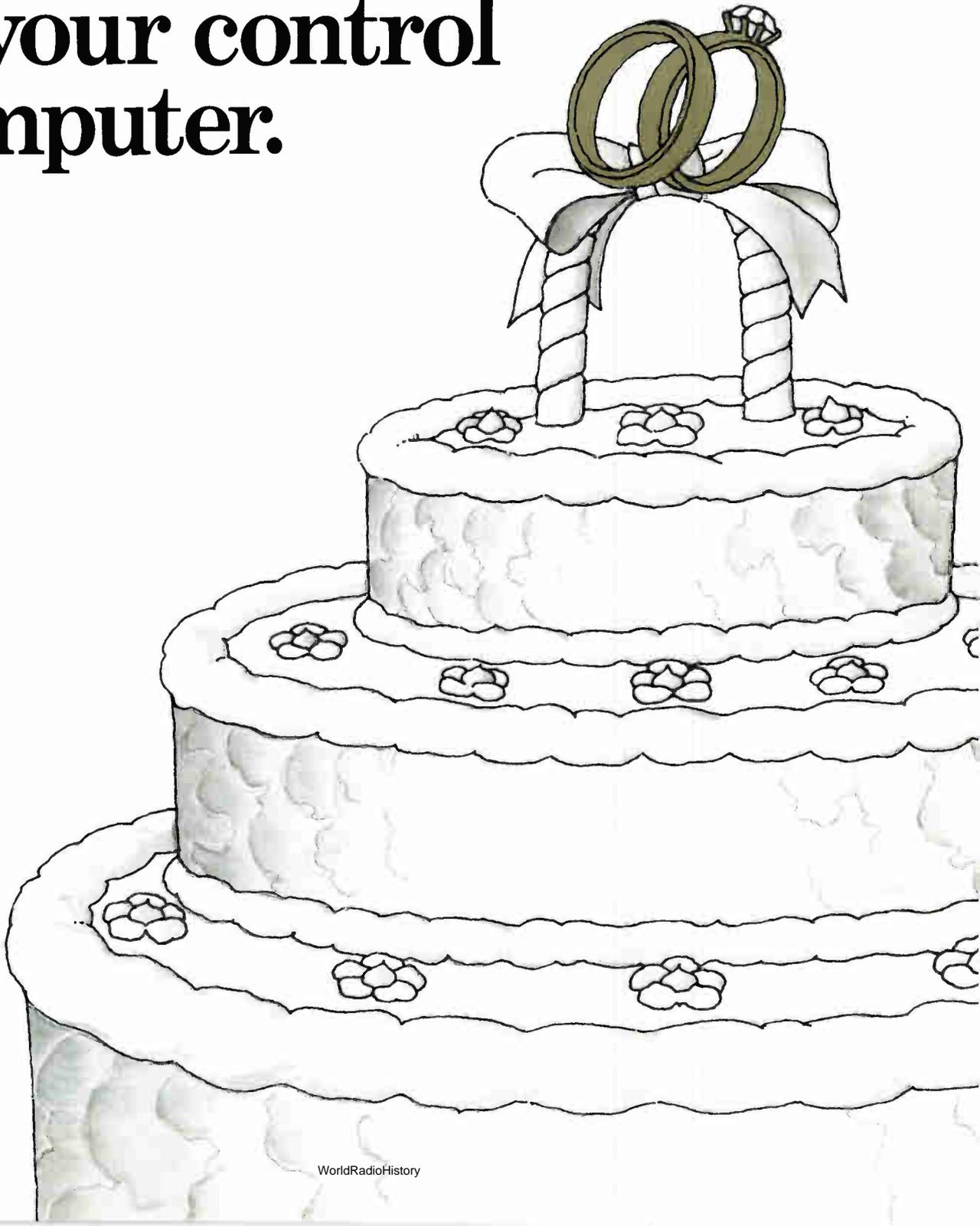
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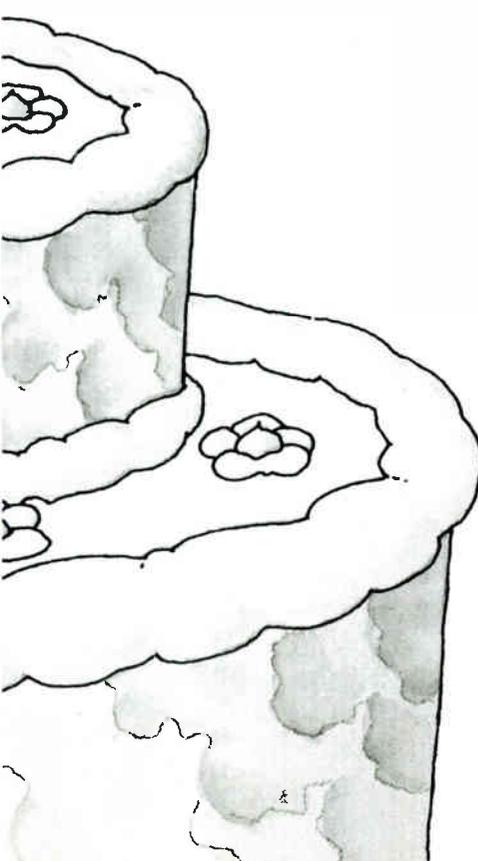
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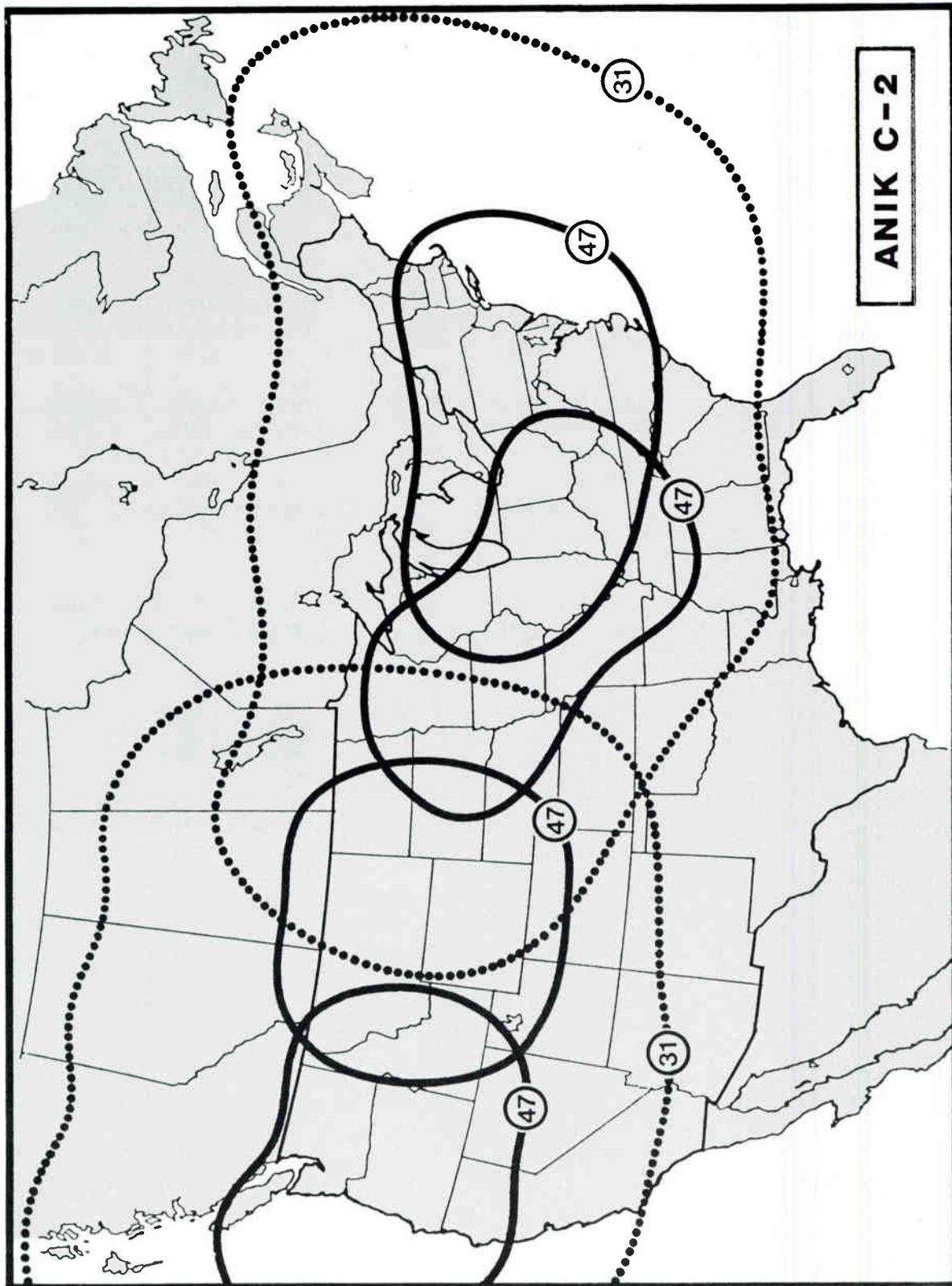
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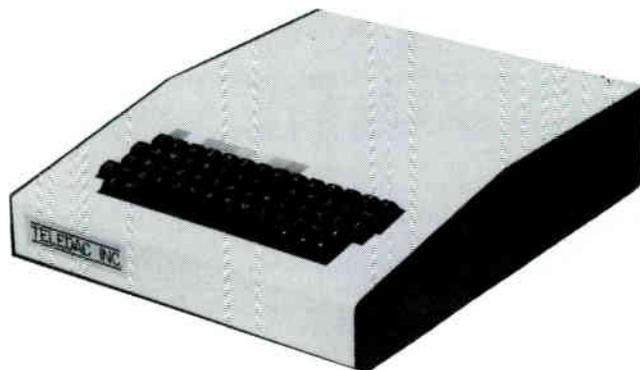
*edge of secondary area when pairs of beams are combined. Polarization is horizontal on the eastern pair, vertical on the western pair of beams. □*

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*continued from page 26*

boresight emerging from the aperture, the phase is nonlinear and can be expressed as a power series. The nature of the power series is such that the even order components detract from overall efficiency, and odd order components work in opposition to the beam deflection. The net result is a beam whose direction (angle  $b$ ) is off boresight and is less than angle  $a$ . This ratio in angles  $b/a=B$  is called "beam deflection factor"; for small feed offsets in parabolic dishes it is approximately 0.8.

In the proposed feed system, two separate feed horns offset from the boresight would be used to receive two completely independent beams emanating from satellites located from  $3^\circ$  to  $5^\circ$  apart on geostationary orbit. With a good parabolic reflector, it is expected that 60% overall efficiency — the equivalent of less than 0.5 dB scanning loss — can be realized at the maximum beam separation of  $5^\circ$ .

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The implementation of a dual beam antenna system of the type described supposes a determination of the following geometrical features:

- 1) The paraboloid boresight pointing angles in azimuth (AZ) and elevation (EL), which must be the average of the AZ and EL angles between the antenna site and the two adjacent satellites.

*continued on page 40*

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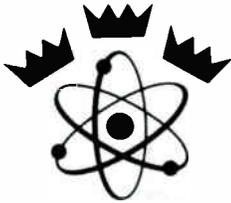
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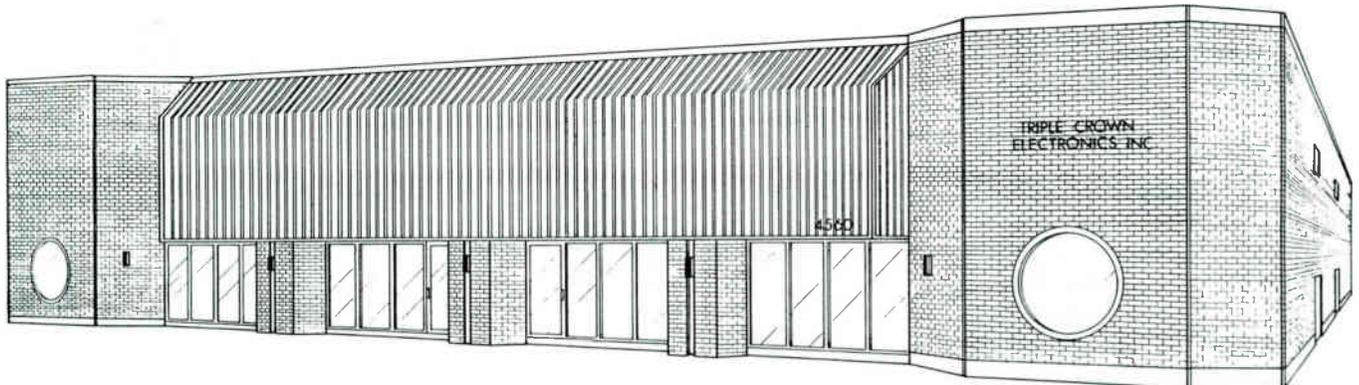
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continued from page 38

- 2) The distance between the feeds, which is a function of the apparent subtended angle between the two satellites.
- 3) The rotational position of the feeds, which is a function of the apparent inclination angle with respect to an antenna-centered coordinate system.

The antenna boresight pointing angles can be determined by the following formulas, and by reference to Figure 3, which shows the various angles in a local earth coordinate system:

$$AZ = (AZ1 + AZ2) / 2, \Delta AZ = AZ2 - AZ1$$

$$EL = (EL1 + EL2) / 2, \Delta EL = EL2 - EL1$$

where

- AZ1 is azimuth angle to the easterly satellite
- AZ2 is azimuth angle to the westerly satellite
- EL1 is elevation angle to the easterly satellite
- EL2 is elevation angle to the westerly satellite

The local angles AZ1, AZ2, EL1, and EL2 can be determined by the following formulas:

$$AZ = 180^\circ + \arctan \left( \frac{\tan \theta}{\sin \alpha} \right) \text{ (degrees) (1)}$$

$$EL = - \arctan \left( \frac{\cos \theta \cos \alpha - R/D}{\sin \theta / \sin AZ} \right) \text{ (degrees) (2)}$$

where

- $\alpha$  is earth station latitude
- $\theta$  is relative longitude or satellite longitude minus earth station longitude ( $\theta < 90^\circ$ )
- R is radius of earth (3,957 miles)
- D is radius of satellite orbit (26,244 miles)

The distance between the feeds and their rotational position can be determined by the following formulas and with reference to Figure 4, which is a mixed coordinate system. In this system, coordinates U and V represent azimuth and elevation with respect to the prin-

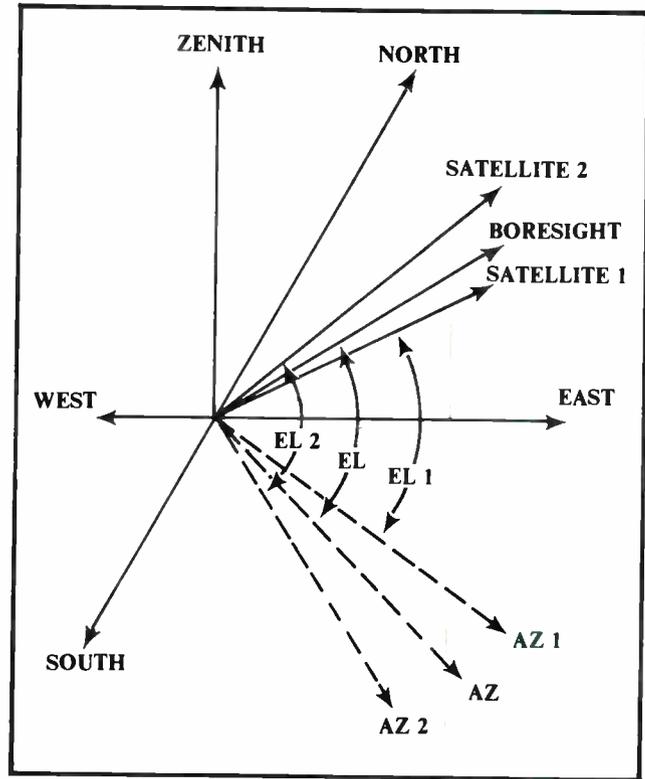


FIGURE 3. LOCAL EARTH COORDINATE SYSTEM

cipal axes of the reflector. In this system, the apparent azimuth separation of the two satellites ( $\Delta AZ'$ ) is approximated\* by

$$\Delta AZ' = \Delta AZ \cos (EL)$$

\*The exact expressions are rather cumbersome. The expressions for  $\Delta AZ'$ ,  $\psi$ , and  $\phi$  are accurate when the angle EL is large compared to  $\Delta AZ$  and  $\Delta EL$ .

continued

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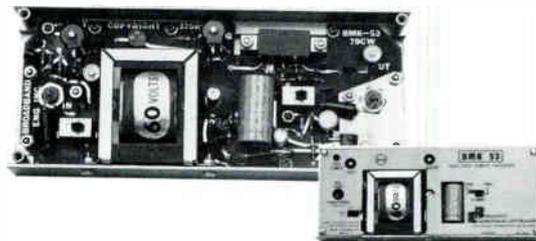
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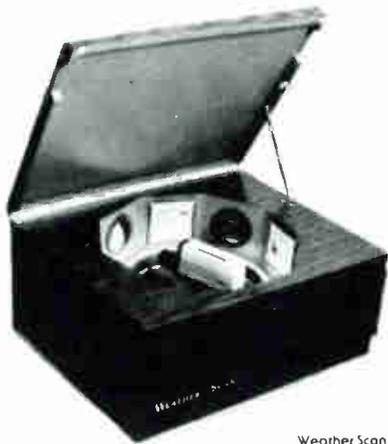
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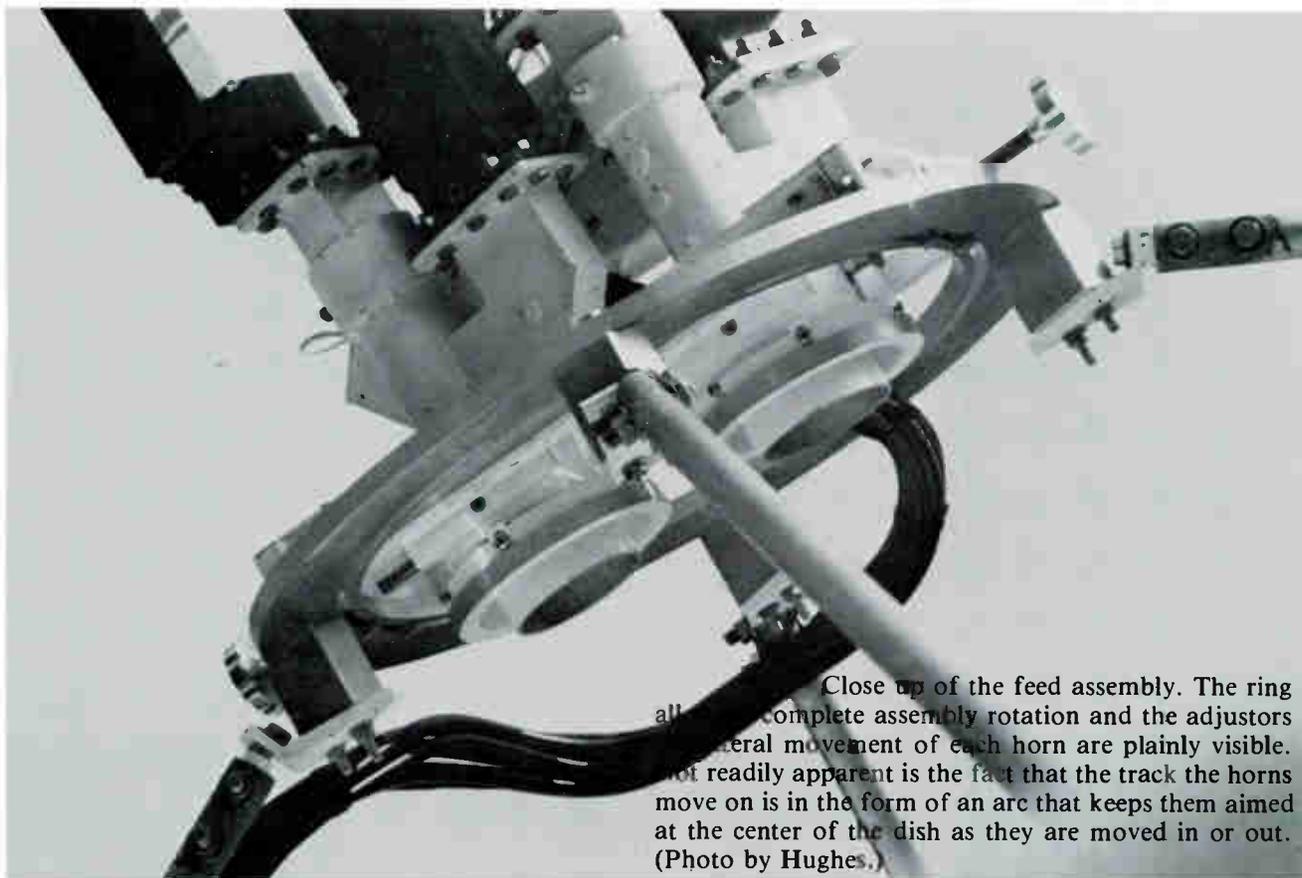
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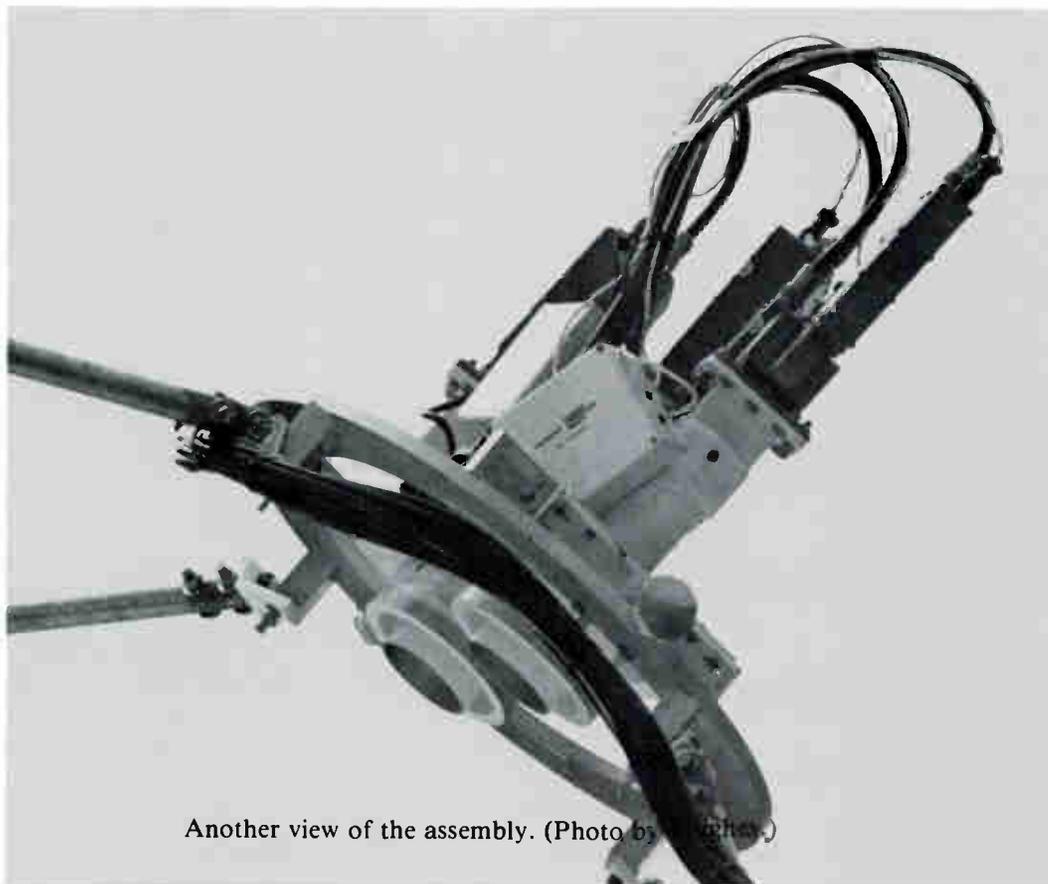
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Close up of the feed assembly. The ring allows for complete assembly rotation and the adjusters allow for lateral movement of each horn are plainly visible. Not readily apparent is the fact that the track the horns move on is in the form of an arc that keeps them aimed at the center of the dish as they are moved in or out. (Photo by Hughes.)



Another view of the assembly. (Photo by Hughes.)

*continued*

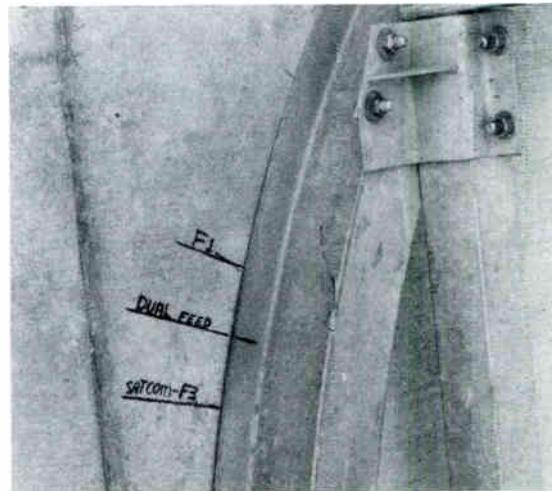
Next the signal to noise tests were made. The same signals received by the single beam and the dual beam antennas were compared using the signal injection method. This is done by utilizing a blank line in the vertical interval and comparing signal noise points to injected noise points. In absolute numbers, there may be as much as a 2 db error in this method, but the comparison between two signals is very accurate. The results of the tests are tabulated in the following chart.

Signal	Single Beam 6 meter S/N	Dual Beam 6 meter S/N
Satcom III-R Ch. 1	49 db	48.5 db
Satcom III-R Ch. 7	53 db	52.5 db
Satcom III-R Ch. 15	52 db	51-51.5 db
Satcom III-R Ch. 4	52 db	51 db
Satcom III-R Ch. 24	52 db	51 db

	Single Beam 5 meter S/N	Dual Beam 6 meter S/N
Satcom I Ch. 8	45.5 db	46.5 db
Satcom I Ch. 2	48.5 db	49 db

The difference between the signal to noise ratio of the six meter and the five meter antennas is slightly over 1.5 db. When this is taken into account, you can see that the dual beam antenna degraded the signals from 1/2 to 1 db from the single beam antenna, with the dual beam six meter antenna out-performing the five meter single beam antenna. This compares favorably with the expected results.

The question was asked if the antenna and modification had been taken to a test range and if the side lobes and gain had been tested there. The reply was "no" but the engineering advisors had assured him that it would pass the applicable FCC specifications. Their conclusions are that if the antenna you now have with the single feed passes the FCC criteria, then the dual beam modifications would also pass. Of course if your antenna does not meet these, the modifications would not help it.



Grease pencil marks on the mounting frame show how the azimuth adjustment was made. First the antenna is boresighted on each satellite with a single feed horn, then it is aimed exactly half way between the two. The elevation settings are done the same way. (Photo by Wayne Sheldon.)

The financial implications of making this modification are favorable. You do not need to buy a new antenna and install a new pad for it. For systems with space problems, additional real estate for the added dish is not required. In some areas it is becoming a real pain to get the permits for another antenna through the local planning and building departments. This bypasses that problem. The cost of the added hardware was not given as Mr. Weinhouse said he "could not speak for other antenna manufacturers, but it would be considerably less than for another complete antenna." Of course the same amount of electronics will be required for either two single beam or one dual beam installation. He estimated that it would take a crew familiar with the modification about four hours to complete the installation. In conclusion, it seems that this is indeed a cost effective way to receive signals from both satellites. □

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### YOUR COLUMN

Several of our readers have asked for a helpful hint column where different ideas and suggestions could be exchanged. Sometimes cable operators have problems that others have faced and solved, and this would be an area where this could be presented without a lot of text. We will be opening our mails to this kind of exchange and hopefully you will participate. This will be known as "Your Column" because that's just what it is — yours — a place where you can ask for help or explain simple solutions to common problems. We hope that you will use it. □

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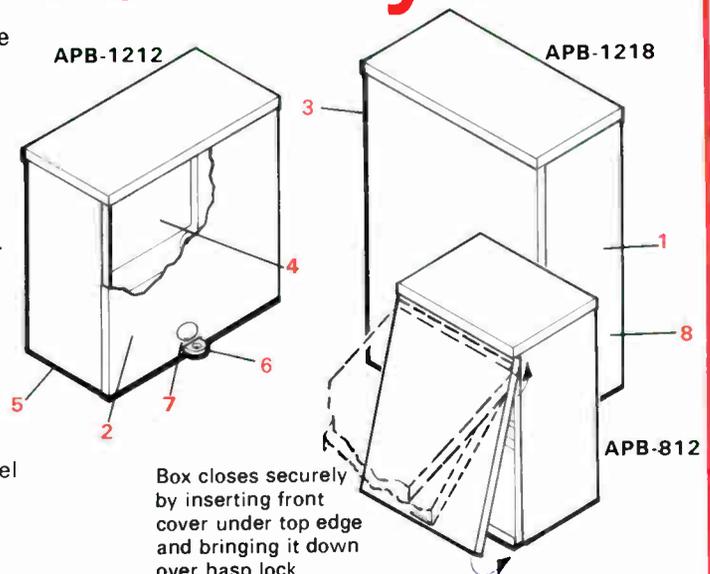
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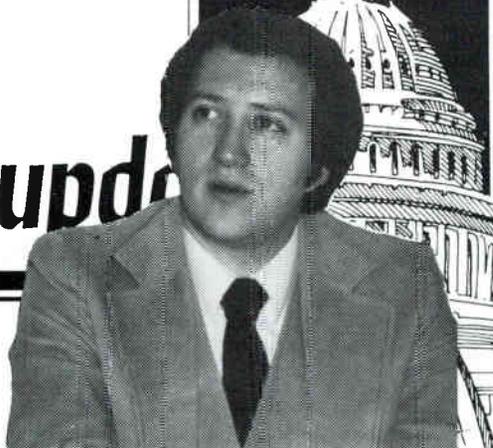
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**S. 2172**



**Questions and Answers  
on Why CATA  
Supports the Bill**

# te Washington update hington up



Steve Effros  
Executive Director, CATA

Ever since CATA announced its wholehearted support of S. 2172, we have been asked a series of questions about **why** we are supporting the bill, **why** we think it is so good for the cable industry, and **why** it would benefit subscribers. Naturally, a lot of these questions have come from cable operators who want to comply with our request that you contact your Senators to support the bill. They, as is reasonable, want to be fully informed about the bill before they talk to their elected officials. Others who are putting questions to us include those who are very much **against** the bill — particularly the city folks, who cannot understand why (except for purely economic reasons) any “thinking” person would support a bill like this.

In an effort to respond to both sides, we offer this Q&A approach to the issues. As most of you know, CATA does not ask its members to blindly support anything. We like to give you as much background as possible so that you can make up your own mind on the issues. To that end, in last month’s issue of the CATAcable, we gave you a full run-down of S. 2172. Just as we were going to press, the bill was slightly modified and then overwhelmingly adopted by the Senate Commerce Committee. That means that the next step will be the Senate floor. The modifications included eliminating all mention of cross-ownership with regard to telephone companies, getting rid of any mention of FCC jurisdiction over signal carriage, and including a provision that would exempt from regulation completely all systems of under 2000 subscribers.

Before getting to the Q&A, let’s deal with some of those changes. The most important one, especially for CATA members, is the last one. It is the clear intent of the drafters of this bill that there be no regulatory burdens placed on any system that has less than 2000 subscribers. What this means is that there would be no rate regulation at all, no access channel requirements, and no other regulatory burdens. Unfortunately, the way this was accomplished was in a last-minute addition to the bill that says any system that has fewer than 2000 subscribers is not considered a “cable system” for the purposes of the act. What that leaves those systems as being, from a definition point of view, is “**broadband telecommunications**” systems. As such, any regulation of them is preempted from the states and cities and is left with the FCC, which is then told it cannot regulate them! Now while the intent in all this was clear, the way it was written into the law **was not**. The complications arise because, for instance, it is no longer clear what happens to the franchise fee limitation since the bill applies it specifically to “cable systems”. It is also not clear what happens to the restrictions on municipal ownership of systems of under 2000 subscribers.

Suffice it to say that the last-minute drafting has caused some problems, but none that cannot be fixed as this bill progresses. Both the majority and minority staffs agree that the intent of the provision is clear, and that now all they have to do is confirm the legislative language at the appropriate time. There can be no question that CATA supports this provision — or at least its intent. It grew out

*continued*

of a larger effort, on the part of the Democrats on the Committee, to completely deregulate the cable television industry. Their ideas, put forward in an amendment to S. 2172 by Senators Cannon and Hollings, was to "sunset" all the provisions of S. 2172 five years after the enactment of the bill. At the same time, they would totally deregulate the cable television industry with the exception of the acknowledged power of the city or state to grant a franchise and exercise its "police power" for safety purposes only (where and when you dig up the street), and to allow them to charge a nondiscriminatory fee for the right to dig in those streets. The fee, of course, would have to be the same that they charge anyone else for that right.

The Cannon-Hollings amendment was just too good. Naturally, the cable industry would be all in favor of being allowed to compete in the marketplace without the excessive regulations we have now. However it is somewhat unrealistic to think that such a total deregulation would successfully get through both houses of Congress. Thus, while we all favored the intent of the Cannon-Hollings amendment, we could not support it to the exclusion of S. 2172 because we did not think it had much chance of final passage. The Committee ultimately voted down the amendment, but retained the intention of full deregulation by applying that full deregulation immediately, at least in so far as the regulatory aspects of S. 2172 are concerned, for systems of under 2000 subscribers.

The elimination of any mention of telephone cross-ownership or signal carriage, or pole attachments were also politically realistic decisions. S. 2172 will have a tough time as it is with the mobilized opposition of the city, state, and access folks. To include provisions such as the ones mentioned above that would wave a "red flag" in front of the broadcast or telephone industries would have assured that the bill would not be able to get through both Houses. It was a pragmatic, sensible decision, and one that CATA agrees with.

**Q. What provision or provisions of S. 2172 are the most important to CATA?**

A. The most important part of S. 2172 is the provision that guarantees a reasonable expectation of renewal for existing cable operators. A second provision, eliminating all regulation of systems of under 2000 subscribers is also of great interest to our smaller system members, however even if they were to fall under the general provisions of S. 2172 they would be well served by the bill.

**Q. Why is renewal expectancy so important?**

A. As CATA has been saying for some time now, one of the **biggest** problems we face is **franchise renewal**. This is so because of two factors: first, the franchise battles that have gone on in the major cities have created an im-

*continued*

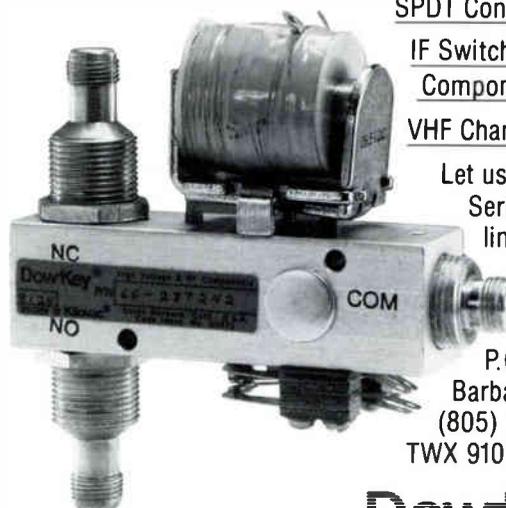
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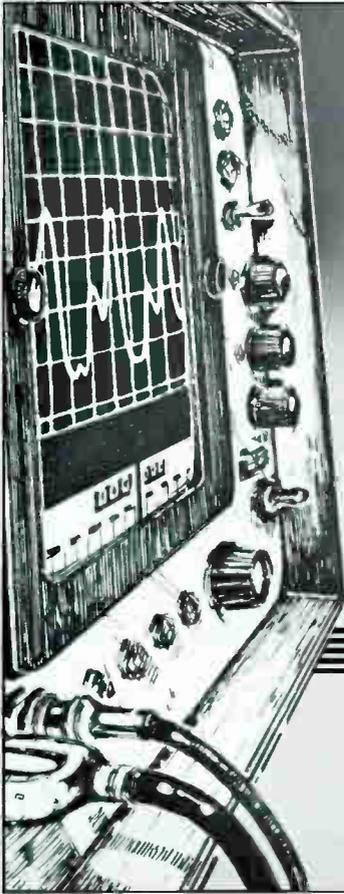
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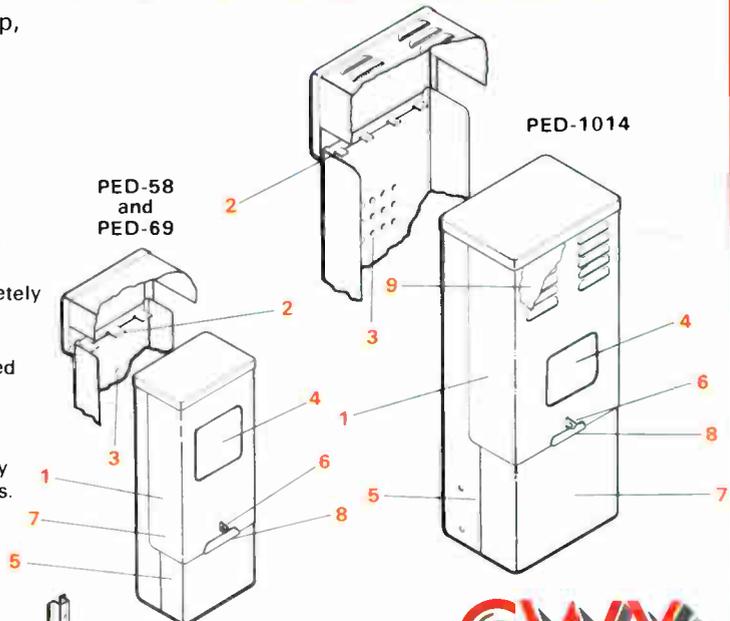
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pression that is not accurate regarding cable television. There has been excessive publicity about all of the "blue-sky" aspects of cable, including very high channel capacity, two-way interactive services, and so-called "institutional loops". While the industry itself is the first to acknowledge that these massive systems can at best be called highly speculative — that there is certainly no guarantee that they will ever make money or that the proposed new services will prove to be economical, that message has not gotten across to local officials. All they have heard is that if a city "goes out for bids" it is likely to get someone to promise more than they have now. Following the **"more is better"** mentality, city officials naturally have decided that it is to their benefit to get "more" for their citizens. Thus, refranchising is quickly becoming a new battleground for the "blue sky" companies. There are, however, many operators who do not believe the "blue sky" operator promises will ever become reality. Even city officials acknowledge that there may be some problem between promise and performance. Their answer to that problem is enforcement mechanisms in new franchises. That may make the city richer by imposing fines on the non-performing cable operator, but it does not provide service to subscribers!

Most CATA members are in the business of serving subscribers. While we appreciate the point of view of some city officials that they should always bargain for "more", we have to point out that nothing is "free". Thus, if the city forces a new bidding contest and gets promises of a 54 channel system instead of a 35 channel system, and gets an added "institutional loop" for city use, and extra access channels and so on, it is not necessarily true that all those negotiated for "goodies" are "bargains" from the point of view of the subscribers who, first of all may not be all that interested in using those special facilities, and second will most certainly be the ones paying for them all!

CATA members are not trying to stop competition. If a city wants to go out and seek an operator who will "promise the world", that is fine by us. However, the city should not take away our business as the price of trying to pay for all the extras they are seeking! If we, as cable operators, have served our subscribers, and the system we are operating, or upgrading, meets the average criteria for systems in cities of the same size and situation, then we should be allowed to continue to serve our subscribers. If the city is right that the citizens want all these "extras" then a new company will come in and build another system and compete. S. 2172 guarantees that our business will not be taken away from us, and our subscribers will not be deprived of service because of the over-expectation of government officials. We would, of course, prefer the government to be totally out of the regulation business. That not being the case, at the very least we can ask that the regulators, when they try to "double" as businessmen (and they have been notoriously bad at doing that over the years), should at least let the existing operator continue to exist and invite competition rather than eliminate the existing operator in the "hope" that they will be correct in their guess as to the future of our business.

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**Q. If CATA's position on this point is as "reasonable" as you seem to make it, why have the National League of Cities, the U.S. Conference of Mayors, the National Institute of Municipal Law Officers, the National Association of Regulatory Utility Commissioners, the National Citizens Committee on Broadcasting and the National Federation of Local Cable Programmers all come out against the bill?**

A. From CATA's point of view you have to look at where all these groups are coming from. Most of them have a stake in regulating cable television. They are the regulators. They do not want to lose power, they do not want to give up any of their turf, regardless of what that turf is. It should come as no surprise to anyone that when the Federal Government proposes to deregulate an area of law that has been the province of the cities and states that those bureaucrats whose job is threatened will fight. In this instance, the federal government moved first. The Federal Communications Commission originally had an extensive series of rules regarding cable television. They saw that regulation was strangling the industry, particularly as it was faced with more and more competition. The FCC deregulated. However, the response of the cities and states was to take over not only the regulation that the Federal officials had tried to get rid of, but also to add to it! S. 2172 is trying to correct that problem by saying that the cable industry should be deregulated. The current regulators don't want to give up their power. They are still of the view that social engineering by bureaucrats is better than allowing the free marketplace dictate what the consumers want. As to the last two groups mentioned, the NCCB has no proven constituency whatsoever. It is a so-called "consumer advocate" that has few, if any consumers as members. As a matter of fact, it recently announced that it may have to cease operation unless it can find some more money from some source to continue. The NFLCP is a group consisting of people who have directly benefitted from the bidding war process. These are the "access groups" that would not get any special attention were it not for the bidding wars. Certainly if anyone ever asked subscribers if they wanted to pay an additional amount of money per month to support the access groups, the answer would likely be very different from what happens when local officials simply "decide" what is "best" for their citizens! In sum, all of the most vocal groups opposing S. 2172 have something to lose, be it access channels and grants or free service to city hall. There is no evidence that the subscribers themselves are demanding to spend more money for services that they show little indication they want.

**Q. If, as you indicate, the subscribers are happy with the entertainment services they get, and want more of them, why not include a provision that would eliminate the "must carry" rules in S. 2172?**

A. CATA is totally committed to the elimination of the "must carry" rules. Our members in many instances are

forced to carry duplicating network signals rather than additional satellite programming under current FCC rules. If we could eliminate the duplicating signals, and other television "must carry" signals that our subscribers indicate they are not interested in watching, then we could put on satellite programming that they are interested in, and are asking us to provide. We could add those programs without a significant increase in cost caused by rebuilding the system, and thus our subscribers could get what they wanted in the most economical way. We are absolutely for the elimination of the "must carry" rules. We believe they are unconstitutional. However we do not favor raising that issue in S. 2172 simply because the bill already raises such significant issues, and is the subject of so much debate that to confuse that debate with the addition of a battle of signal carriage would **not** be to anyone's benefit. We prefer to take on these fights one at a time.

**Q. Does that sentiment also go for pole attachment disputes and telephone-cable cross ownership?**

A. Yes. As a matter of fact we do not think that the other ownership provisions should be in S. 2172 either. The restriction of Canadian ownership that is implied, although not absolutely required in the bill, is something we disagree with. It is a subject that is best left to a separate discussion and debate. In that case, we do not think that the Federal Government should interfere with open com-

*continued on page 54*

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**GENERAL COOKBOOK NOTE**  
 Cookbook designs are selected for their general purpose applicability and for quick construction, using easy-to-get parts. Explicit theory is avoided and is implicit in the simple formulas for circuit elements. We will present each design in "stand alone" forms: no need to go to any other technical references! Part #4 of the series follows...

# Power Passing Part 4: 75 OHM EQUALIZERS

## CABLE TECH'S FILTER

### SUMMARY

The filter circuit of figure 1A has good return loss and its attenuation decreases about 3 db over a 2:1 frequency band. It can therefore be used as a matched amplitude equalizer.

It can be built using readily available ceramic disc capacitors, carbon composition resistors and hand-wound coils.

By interchanging L and C (figure 1B) the attenuation increases approximately 3 db per octave. It can be used as a leveller.

### HOW IT WORKS

Referring to figure 1A, and looking into the input, as frequency becomes very high, the series branch approaches 0 ohms and the shunt reactance becomes very high. So we see the 75 ohm system beyond, get good return loss and no attenuation.

As frequency approaches 0, the series branch becomes 75 ohms, the shunt branch approaches 0 ohms. We see a good return loss but a large attenuation.

We would suspect then, that at intermediate frequencies, we will see a good return loss and an intermediate value of attenuation. (See equation, Fig. 1).

We would use the circuit of figure 1A to level a CATV system whose loss increases with frequency. We would use the circuit of figure 1B to level the frequency response of a sampling probe whose signal output increases with frequency.

For increased equalization (or levelling) you may put two or more circuits in series. Each circuit will introduce 3 db at  $F_0$  and an approximate 3 db change over a 2:1 frequency band.

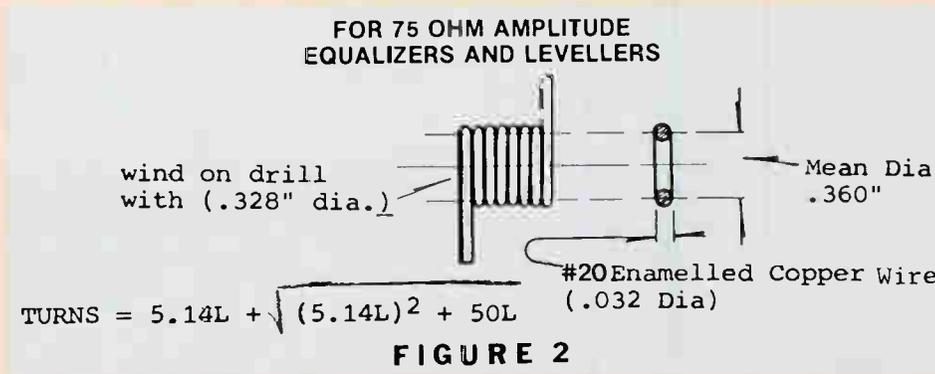
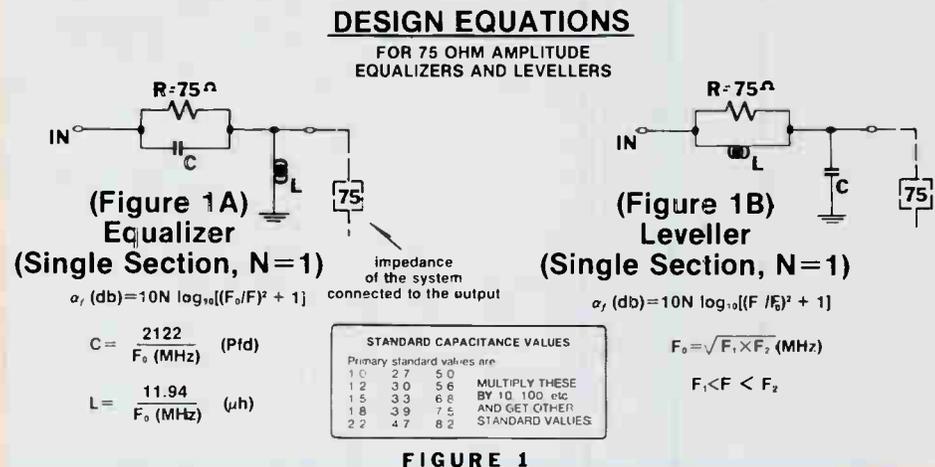
lower and upper edges, respectively, of the band you want to equalize (or level).

### (2) Circuit Elements

The resistors are 75 ohm carbon composition. Do not use wire-wound. L and C are computed from Figure 1. Use the standard capacitance table for nearest

### DESIGN

(1) Compute  $F_0$  using the equation of Figure 1.  $F_1$  and  $F_2$  are the



# AMPLITUDE & LEVELLERS COOKBOOK



BY:  
Glyn Bostick  
Laurie Goldman  
Microwave Filter Company, Inc.

value. If necessary, to match theoretical value within 5%, parallel two standard capacitors. Use the formula of Figure 2 to wind the required coil.

(3) **Adjustments**

Adjust the coil until you measure 3 db at  $F_o$ , for a single circuit, or  $3 \times N$  db for  $N$  circuits in series.

### DESIGN EXAMPLE

- (1) We want to equalize the 54-216 MHz (F1-F2) band by about 6 db. We will use the circuit of Fig. 1A:

$$F_o = \sqrt{54 \times 216} = 108 \text{ MHz}$$

For 1 circuit  $\alpha_{54} = 10 \log \left[ \left( \frac{108}{54} \right)^2 + 1 \right] = 7 \text{ db}$   
 $\alpha_{216} = 10 \log \left[ \left( \frac{108}{216} \right)^2 + 1 \right] = 1 \text{ db}$

Equalization = 6 db

So, we will use one circuit ( $N = 1$ )

(2) **Circuit Elements**

This being a head-end circuit not requiring power passing, we will use a 1/4 W little-Devil 75 ohm resistor.

$$C = 19.65 \text{ pfd}$$

We will use two 10 pfd (standard valve) capacitors in parallel.

$$L = .1105 \mu\text{h} \text{ (2)}$$

From Figure 2, turns =  $2.99 \approx 3T$

- (3) We sweep the circuit and adjust the coil for 3 db at 108 MHz. ( $F_o$ ).

Figure 3 is a photo of the finished circuit 1A.

Figure 4A is a spectrum sweep of attenuation and Figure 4B illustrates good return loss 54-216 MHz.

### NEXT TIME

We'll return to low-pass and high pass filters and show how to use them to design Band-pass filters with arbitrary bandwidth and sharp cut-offs at the band edges.

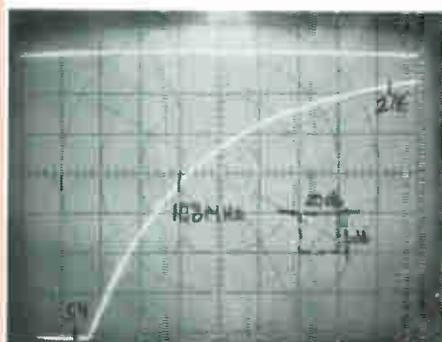
### ACKNOWLEDGEMENTS

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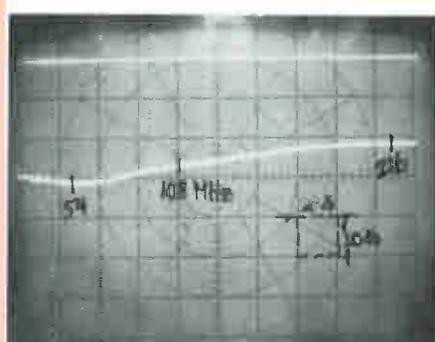
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SPECTRUM SWEEP PICTURE  
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RETURN LOSS  
PICTURE

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*continued from page 51*

petition, regardless of its source. Once again, our focus is on the subscriber, and we believe that subscriber will get better service if that service is provided in the free, open marketplace — a marketplace that does not artificially restrict anyone.

**Q. You have said publicly that you do not think this bill will pass both Houses of Congress this year. If that is true, why are you asking your members to call their Senators now?**

A. There is little likelihood that this bill will get through both the Senate and the House during this session of Congress if, for no other reason than, that there is not enough time left in this session. This is, after all, an election year, and Congress wants to get home to campaign. We are asking for all-out support now because if the bill is adopted by the Senate now, it will hopefully be that much easier to get it considered **EARLY** in the next session of Congress. That is important so that the House will have adequate time, without the pressure of upcoming election, to consider the merits of the bill.

**Q. If CATA is so strongly in support of S. 2172, why did it oppose S. 898 in the last session of Congress? Didn't S. 898 have a lot of the same provisions in it that S. 2172 now has?**

A. No. S. 898 was a much larger bill dealing primarily with common carrier legislation and telephone issues. The cable provisions were added at the last minute, without any substantial debate on the provisions. CATA opposed not only the linking of cable issues to a telephone bill (which, by the way, subsequently died in the House), but also the fact that at the time of their addition, there was an inadequate record before the Senate to support the necessary deregulation that we were seeking. S. 2172 goes a lot farther in the direction of deregulation than did the provisions in S. 898. Further, S. 2172 was a product of full hearings before the Senate Communications Subcommittee. Our opponents cannot argue that they were not heard. They had their "day in court", and they lost. That is as it should be. Thus, CATA's opposition to S. 898 is not in any way inconsistent with our wholehearted support for S. 2172.

Well, that's it — that gives you as up-to-the-minute a position as we can on our support for S. 2172. If you agree with that position, **please do not wait any longer to call your Senator's and let them know of your support for the bill. It could come up on the Senate floor at any time. Your call DOES** make a difference! Look at it this way; why spend all the dues money you are spending to be a member of CATA or NCTA, or any of the regional or State associations that are designed to protect your interests, and those of your subscribers, if you are not also willing to spend a little time to write a letter or send a telegram or make a call? You should be educating your subscribers about all this too! Get them to contact their Senators and Representatives. After all, in the long run it is their money that these local "blue sky" officials are spending. **Pick up the phone right now and call!** □

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# PRELIMINARY

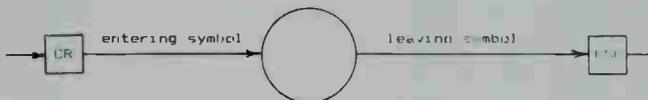
This preliminary software specification technical bulletin defines the MICRO-1/1.5 operating system in flow chart form. The final version will offer a complete verbal description supported as appropriate by flow charts. That version is in process and will be available in the near future.

# PRELIMINARY

The following diagrams ( Fig. 1 thru Fig. 7 ) is a graphical representation of the MICRO-1/1.5 OPERATING SYSTEM flow. It is easy to use these diagrams to become familiar with the MICRO-1/1.5 OPERATING SYSTEM, if one will remember a few rules.

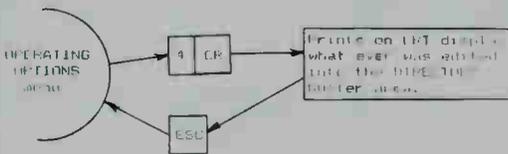
Direction of system flow is determined by the direction of the arrow on the line leaving or entering the symbols.

The larger symbols, both circular and right-angled, designate the response displayed on the CONSOLE CRT terminal by the OPERATING SYSTEM.

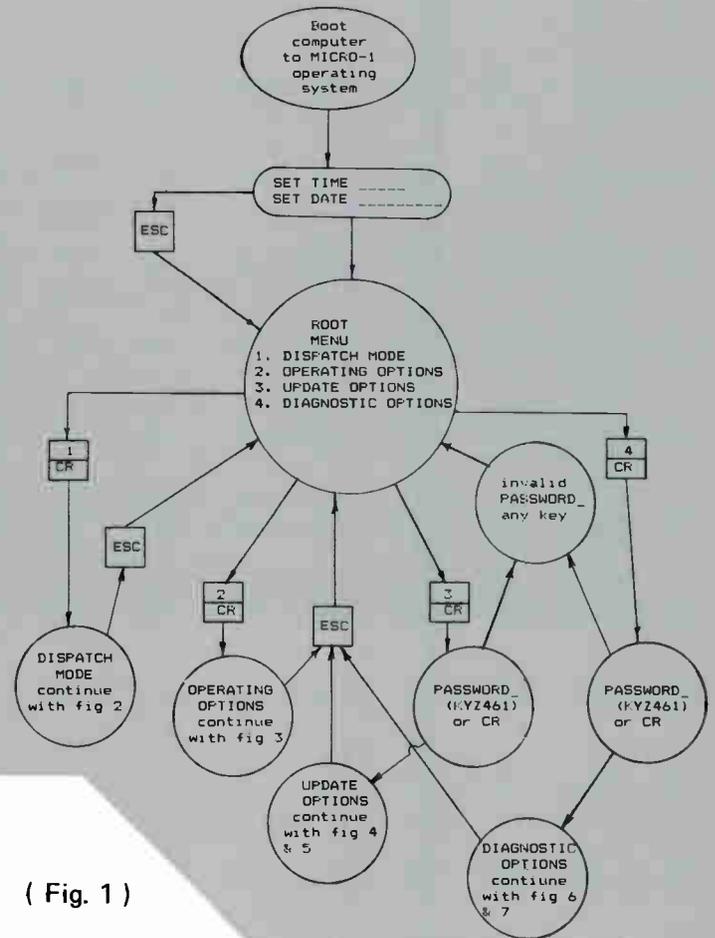


Leaving a symbol is initiated by pressing the key described inside of the rectangular figure.

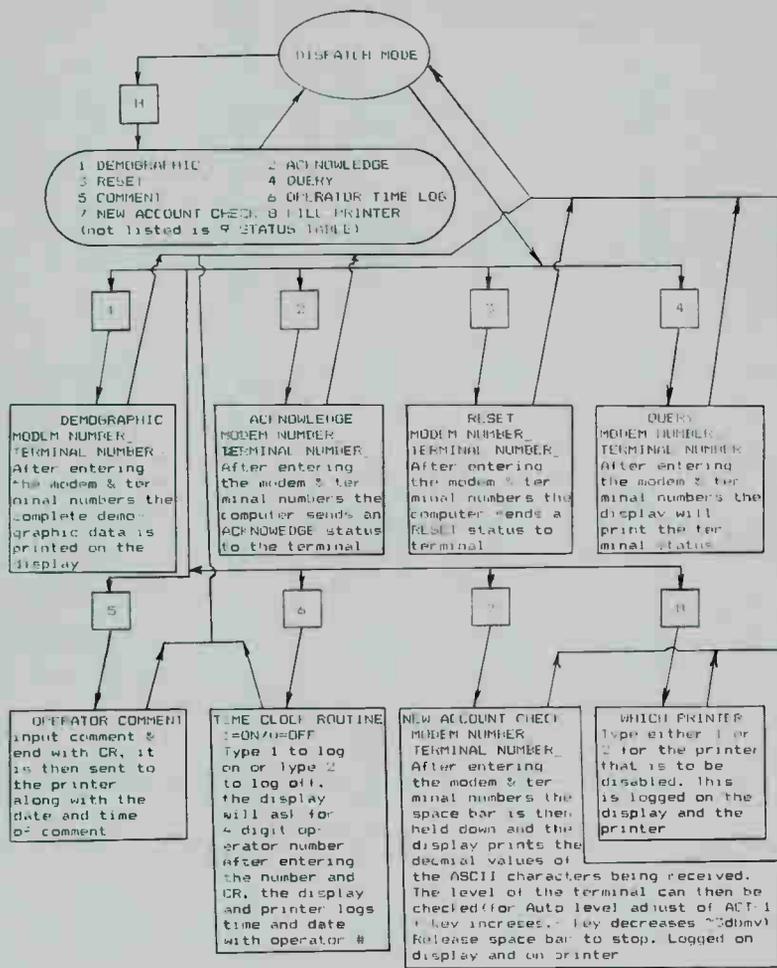
example:



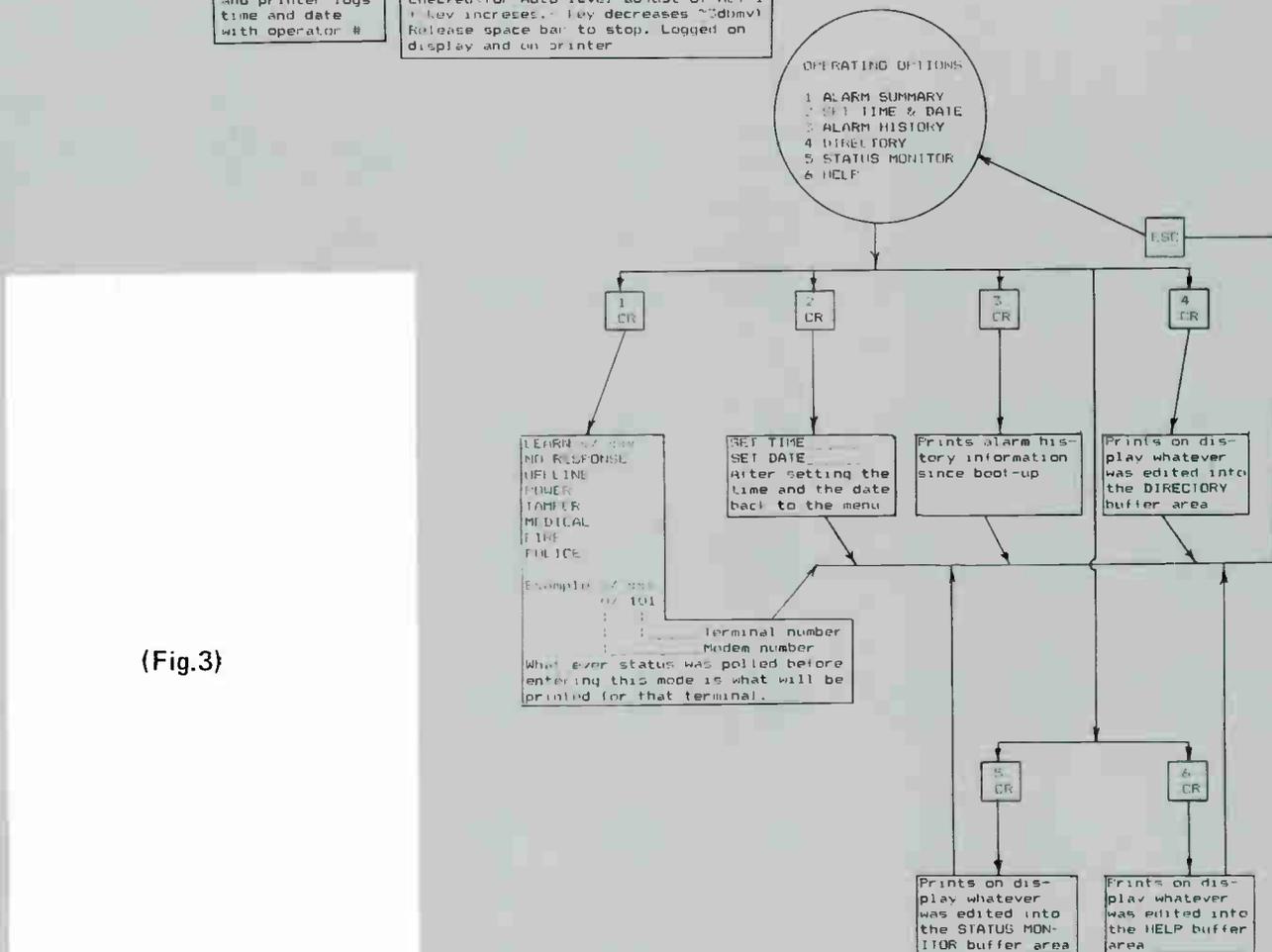
To view the DIRECTIONS which in the OPERATING OPTIONS menu one must press the 3 key. Thus the BUFFER key in these diagrams the BUFFER key is symbolized by CR and the escape key is ESC. The DIRECTIONS will then be printed on the CRT display (or viewing). To get back to the OPERATING OPTIONS menu the escape key is pressed.



( Fig. 1 )

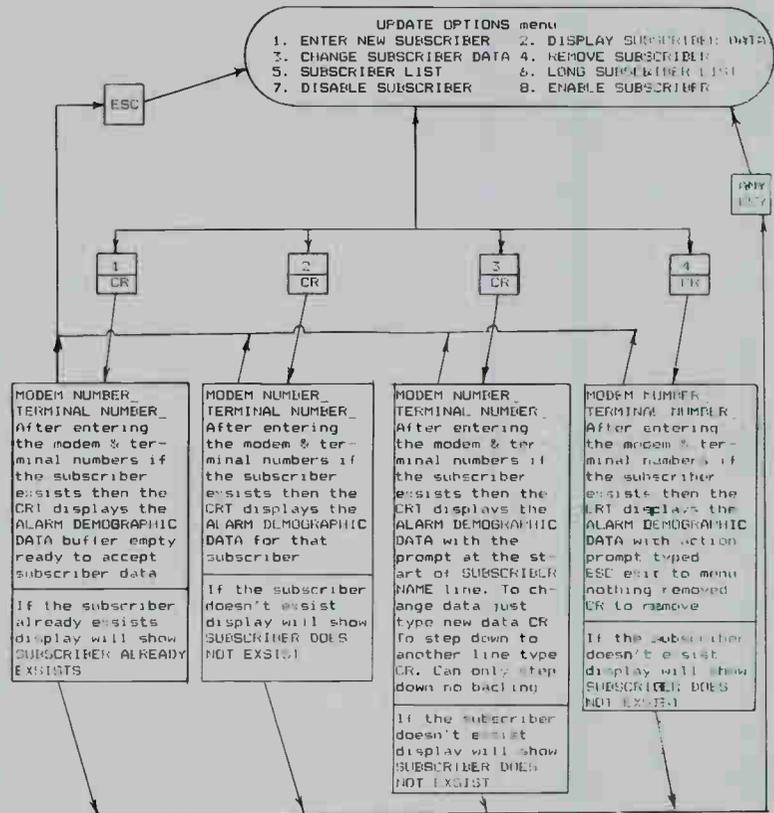


(Fig.2)

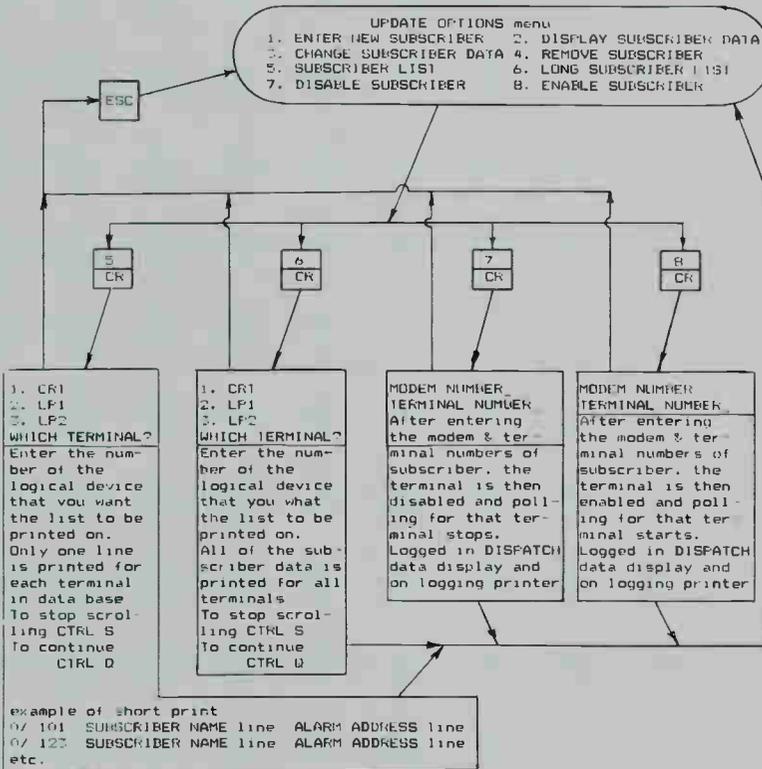


(Fig.3)

(Fig.4)



UPDATE OPTIONS continue with Fig. 5



(Fig.5)

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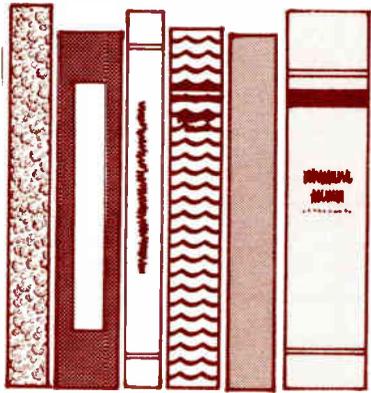
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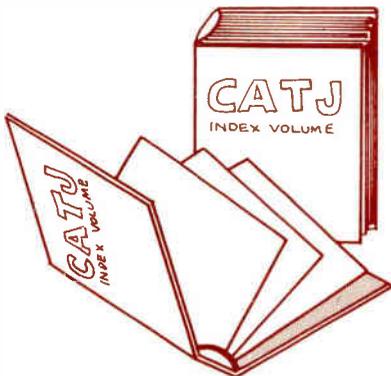
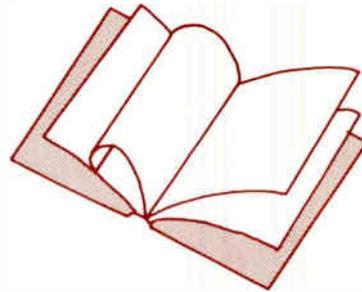
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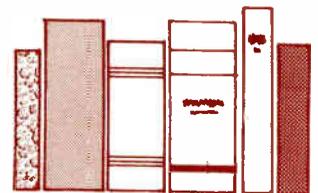


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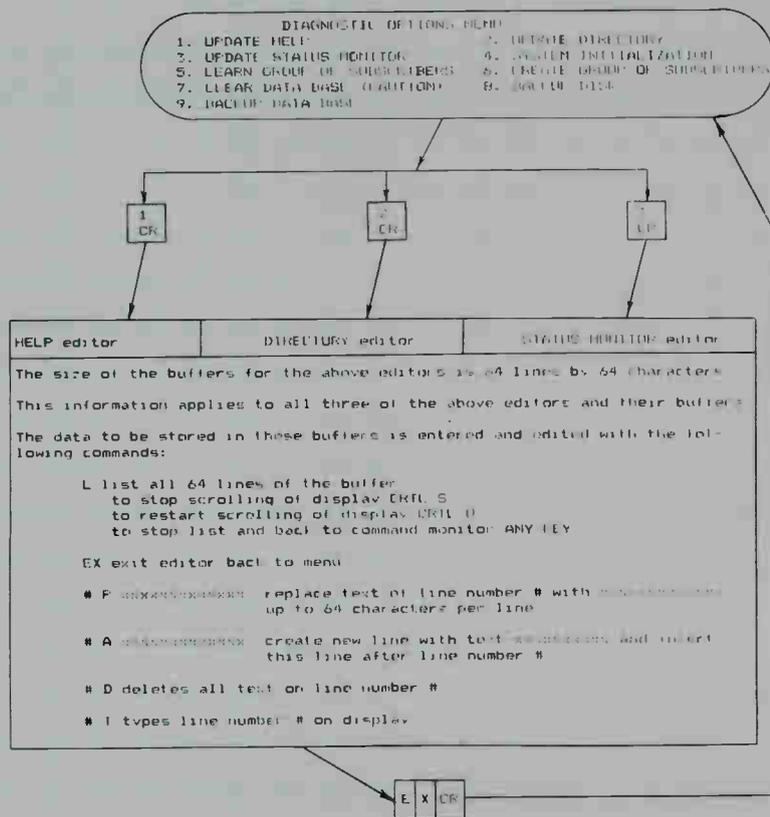
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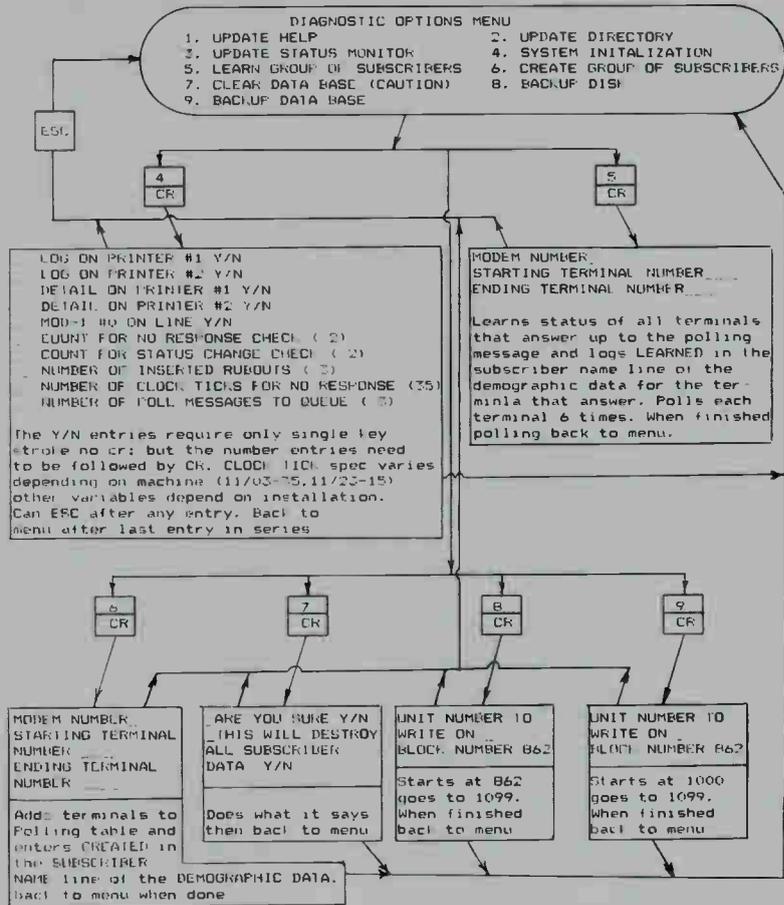
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(Fig.6)

DIAGNOSTIC OPTIONS continued on Fig. 7



(Fig.7)



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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

Note: Associates listed with \* are Charter Members.

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

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

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

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

\* **Anlxtar-Purzan, Inc.,**  
4711 Golf Road,  
Skokie, IL 60076  
312—677-2600  
(D1)

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

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

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

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

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

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

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

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

**Broadcast Equipment  
Leasing,**  
7 Wood Street,  
Pittsburgh, PA 15222  
412—765-0690  
(S3)

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

**CATEL,**  
1400-D Stierling Rd.,  
Mountain View, CA 94043  
415—969-9400

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

**CBS Cable,**  
1211 Avenue of the  
Americas, 2nd Floor,  
New York, NY 10019  
1-800—528-3341  
(S4)

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

**CRC Electronics, Inc.,**  
2669 Kilihau St.,  
Honolulu, HI 96819  
808—836-0811  
(M9 Videotape & Headend  
Automation Equipment)

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

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

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

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

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

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

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

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

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

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

**Communications Supply/  
Construction, Inc.,**  
319 J Westtown Rd.,  
P.O. Box 1538,  
West Chester, PA 19380  
1-800—662-2428 (PA)  
1-800—345-8286 (US)  
(D1, 3, 4, 5, 6, 7, 8, 9,  
S1, 2, 8, 9)

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

# Associate Roster

**ComSearch Inc.,**  
11503 Sunrise Valley  
Drive,  
Reston, VA 22091  
703-620-6300  
(S8, S9, Earth station  
placement frequency  
coordination)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Lester Kamin & Company,**  
2020 North Loop West,  
Suite 111,  
Houston, TX 77018  
713-957-0310  
(S9 Brokers Consultants)

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

**Magnavox CATV Division,**  
100 Fairgrounds Drive,  
Manlius, NY 13104  
1-800-448-5171 or  
1-800-522-7646 (N.Y.)  
(D4, 5, 7, M4, 5, 6, 7, S3, 8)

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

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

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

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

**Midwest Corp.,**  
One Sperti Dr.,  
Edgewood, KY 41017  
1-800-624-3845  
(D1, 2, 3, 4, 5, 6, 7, 8)

Distributors	Manufacturers	Service Firms
D1—Full CATV equipment line	M1—Full CATV equipment line	S1—CATV contracting
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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

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

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

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

**National Screen  
Service Corp.,**  
1600 Broadway,  
New York, NY 10019  
212—246-5700  
(M9)

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

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

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

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

**Prodelin, Inc.,**  
1350 Duane Avenue,  
Santa Clara, CA 95050  
408—244-4720  
(M2, M3, M7, S2)

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

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

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

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

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

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

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

**Shafer Associates, Inc.,**  
9501 Briar Glen Way,  
Gaithersburg, MD 20760  
301—869-4477  
(S9, consultant)

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

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

**Station Business Systems,**  
600 West Putnam,  
Greenwich, CT 06830  
203—622-2400  
(S4, 5, 9)

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

**TeleCom Systems, Inc.,**  
P.O. Box 5214,  
Charlotte, NC  
704—332-6064  
(S1, 2, 7, 8, 9)

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

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

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

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

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

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

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

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

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

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

**USA Network,**  
208 Harristown Rd.,  
Glen Rock, NJ  
201—445-8550  
(S4)

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

**U.S. Tower,**  
P.O. Box 1438,  
Miami, OK 74354  
918—540-1574  
(M2, M9)

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

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

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

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

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

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

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

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

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

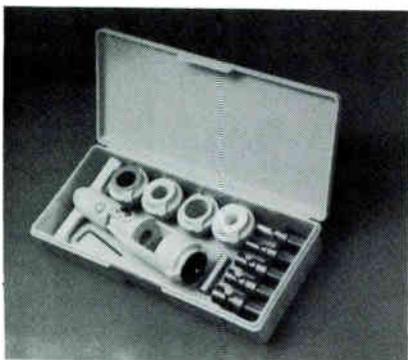
# SHOWCASE

## POLELINE'S COREPREP 5™ CORING AND STRIPPING TOOL AND CORDLESS DRILL/SCREWDRIVER

Poleline Corporation, a subsidiary of RMS Electronics, introduces its new combination coring and stripping tool, CorePrep 5™ and the Makita 6010 DW Cordless Drill/Screwdriver.

CorePrep 5™ is revolutionary in design, in that one tool enables the installer to both core and strip any one of 5 popularly sized cables with the simple change of a cutting blade and guide sleeve. This tool will prepare .412, .500, .625, .750 and .875 coaxial cables easily and quickly. The DC clutch handle enables the installer to work quickly with less possibility of hand fatigue. The self cleaning and non-clog design speeds cable preparation by 50%.

The tool body is made of super-tough, high density, nylon plastic that will not break. This material makes it easier to work with in cold temperatures. A three inch length scale is notched into the housing in order to gauge preparation of center conductor length.



The CorePrep 5™ tool is a bright orange color for fast and easy location if dropped into snow or under growth. As well, each cable guide sleeve and cutting blade is color-coded to prevent user error in operation. It is adaptable for use with a power drill, by removing the clutch handle, inserting the chuck adapter

(included with purchase) and easily connecting the tool to the drill.

\*CorePrep 5™ may be purchased two (2) ways:

1. As a coring and stripping tool for one cable size
2. As a coring and stripping tool for two cable sizes.

Additional cutting blades and cable guide sleeves are purchasable, if needed. CorePrep 5™ comes complete with heavy duty plastic storage case, Allen wrench, chuck adapter, cable guide sleeve and cutting blade of your choice and of course, the tool itself. If coring and stripping one inch coaxial cable, it is necessary to purchase a separate tool called CorePrep 1™. The principle differences between CorePrep 1™ and CorePrep 5™ is that CorePrep 1™ is a non-interchangeable tool and is good for our inch cable only.

As the perfect complement to its CorePrep 5™ and CorePrep 1™ combination coring and stripping tools, Poleline is carrying the Makita 6010 DW cordless drill/screwdriver. This low RPM, high torque drill makes it the tool to use when you are coring and stripping aluminum cables. Because it is cordless, the unit is ideal for field use.

The rugged, high-impact body construction and textured handle grip is comfortable and easy to work with in all climates.

The Makita 6010 DW has many popular features:

- (1) Cordless — works anytime, anywhere.
- (2) Rechargeable — battery can be fully charged and operational in one hour.
- (3) Lightweight — won't cause arm strain to lineman.
- (4) Circuit Breaker — built in to prevent drill overload and motor burnout.
- (5) Reversible — drill will go forward or backwards with the flip of a switch.
- (6) Clip on Chuck Key — allows you to easily change drill bits.



A standard feature of the drill is the DC7000 Fast Charger that comes with the unit. The drill fully recharges in one hour by placing the battery into the Fast Charger that plugs into any standard 110V outlet (an optional adapter plug for the car lighter is also available). Due to a pilot light on the charger, it is virtually impossible to overcharge the battery, as the light goes out indicating when the battery is fully charged. With the quick recharge, the drill can usually be used for an average of eight hours, recharged and used the next day with no problems.

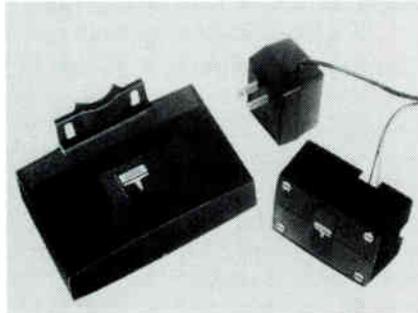
This drill is functional for all CATV installation and construction work. Make sure that you contact your Poleline Corporation account executive today for pricing information and shipment of the Makita 6010 DW Cordless Drill/Screwdriver, as well as the CorePrep 5™ and CorePrep 1™. Contact RMS, 50 Antin Place, Bronx, N.Y. 10462 or call 212/892-6700.

## NEW GALAXY III PREAMPLIFIERS FOR HOME USE INTRODUCED BY BLONDER-TONGUE

Blonder-Tongue Laboratories, Inc., Old Bridge, NJ today announced the availability of a complete new line of mast mounted preamplifiers for home installations. The sixteen different models allow an installer or home owner meet any TV signal amplification requirement. All UHF models are fully operational thru Ch. 83.

All Galaxy III Preamplifiers are designed with a low noise figure for a snow-free TV picture. The Galaxy III power supply consists of an all new transformer/power adder simplifying

hook-up and mounting and improving reliability. Each dual model Galaxy III unit has a built-in splitter making it easy to feed two TV sets from one pre-amplifier with no degradation of the picture. Each Galaxy III is protected from lightning and power line surges.



Split band VHF amplifier sections eliminate low band signal interference with the high band and optimize dynamic range. UHF/VHF models have a separate UHF amplifier section.

Galaxy III Preampifiers feature a modern design high impact polypropylene case. Each unit includes heavy duty mast mounting hardware to insure secure installation and is individually packaged in a colorful display box.

For more information, contact Blonder-Tongue, One Jake Brown Road, Old Bridge, NJ 08857.

**September 29-30:** A Blonder-Tongue MATV/TVRO Earth Station Seminar will be held in Randolph, MA in conjunction with W.A. Hendrickson Co. Contact: Bob Hendrickson (617) 545-0652 or Gloria Rothfuss (201) 679-4000.

**OCTAGON-SCIENTIFIC, INC.  
JOINS WITH  
REGENCY ELECTRONICS, INC.**

Octagon-Scientific, Inc. has joined with Regency Electronics, Inc., and have revealed the name ROMAN as the designation of its recently formed joint venture company. This firm will create and administer the marketing and sales functions for the companies' new 450 MHz subscriber terminal product line. This series of attractively styled products will carry the ROMAN name and its initial debut at the NCTA show in Las Vegas where units such as the ROMAN RO/CP-3R, 450 MHz programmable converter with wireless remote control were featured.

These subscriber products utilize state-of-the-art microprocessor concepts and are designed to be modularly

field upgradeable to addressability. The complete ROMAN Series will offer such features as silent fast up and down scanning as well as standard individual channel selecting. Favorite channel memory and last channel recall are available via remote control. Options include parental control, channel agility, frequency offsets, A/B cable switch, saw output filter, switched AC convenience outlet and either standard, HRC or IRC channel assignment selections. The addressable versions additionally offer two separate suppression modes of scrambling and 128 tiers are available in two modes of operation for a total of 256 different addressably-controlled tier combinations. A unique and tamper-proof security design is built into each unit.

For additional information and/or a personal demonstration, contact Peter D. Warburton, Executive Vice President, Octagon-Scientific, Inc., 476 E. Brighton Ave., Syracuse, New York, 13210. Tel: (315) 476-0660.

**M/A-COM VIDEO SATELLITE, INC.  
MARKETS 12 GHZ SATELLITE RECEIVING  
SYSTEMS**

M/A-COM VIDEO SATELLITE, INC., today announced the availability of 12 GHz equipment for the CATV/SMATV industry and private communications network.

Presently, TVRO (television receive-only) systems receive 4 GHz signals transmitted from most domestic satellites. Given recent government deregulation of the 12 GHz satellite band, reception of a multitude of services including entertainment programming and private communications networks (including data transmission) will be possible using small diameter antennas.

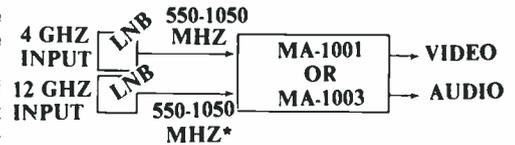
Systems at 12 GHz will feature the performance, capabilities, and functions of M/A-COM's already-proven 3.7 to 4.2 GHz satellite reception equipment.

M/A-COM's 12 GHz low noise block downconverters (LNB's) are compatible with the MA-1001 and MA-1003 LNB Satellite Receivers and allow system upgrades at minimum cost (Figure 1). A typical four channel system will use a small diameter antenna, two LNB's, and four satellite receivers to provide four channels of reception, two each on horizontal and vertical polarization. According to James F. Bunker, president, four channel systems will cost as low as \$9500.

New production techniques and facilities are responsible for the reduced cost of M/A-COM TVRO components.

M/A-COM will use its precision molding techniques for 3 and 3.7 meter parabolic antennas and high volume manufacturing facilities to produce LNB's and satellite receivers.

Technically, the LNB downconverts, as a block, the frequencies 11.7 to 12.2 GHz to an intermediate frequency band of 550 to 1050 MHz to be carried by low cost cable to the satellite receiver.



**\*ACCEPTS EITHER INPUT**

Figure 1

The satellite receiver features 24 channel frequency agility using a synthesized local oscillator. The circuits in this receiver are standard M/A-COM designs, insuring quality video reception under marginal signal conditions.

For further information contact: J. Duke Brown, National Sales Manager, M/A-COM Video Satellite, Inc., 32 Third Avenue, Burlington, MA 01803, (617) 272-3100 ext. 1885.

**SCIENTIFIC-ATLANTA PUBLISHES  
CATV SECURITY MONITORING  
SYSTEM DATA SHEET**

Scientific-Atlanta, Inc., has published a comprehensive data sheet featuring its Series 2400 cable security monitoring system. The system consists of a computer, CRT and line printer terminals, easy-to-use software package, headend alarm scanner and subscriber transponder, which is the interface between the monitoring system and the residential alarm system. The computer can be configured to handle from 2,000 to 64,000 subscribers, and each alarm scanner can poll up to 4,096 subscribers. The maximum polling cycle time is 70 seconds. In the case of an alarm a second return channel permits instantaneous alarm response.

The new data sheet presents an overview of the system, including Scientific-Atlanta's exclusive software package. To receive copies, write to Scientific-Atlanta, Inc., Box 105027, Dept. A/R, Atlanta, Georgia 30348.

For additional information contact: Donald R. Meyer, Marketing Manager, Cable Security Products Division, 404/441-4000.

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## TECHNICAL OPPORTUNITIES

### SENIOR DESIGN ENGINEER — FEE PAID TO 40 K

A leading East Coast Cable TV components manufacturer is offering an unusual growth opportunity for a talented design engineer. The candidate must have an electrical engineering degree, as well as experience in the design of video scrambler/descrambler devices and related RF communications items. Although some traveling is required, the candidate would work at the East Coast corporate headquarters.

The company is listed on The American Stock Exchange and offers a generous benefits program. This includes Blue Cross, Major Medical and dental coverages, as well as an excellent noncontributory retirement pension program.

If you meet these qualifications and would like additional information about this fine career opportunity, please contact:

Mr. John de Elorza  
John de Elorza Associates  
201-686-5511

Company will pay all relocation expenses.

### ENGINEERS

Coaxial Communications, a pioneer in cable technology, is expanding its engineering department. We are seeking degreed, experienced individuals who are highly self-motivated, ambitious and able to work independently. Positions are available for:

- I. A Lab Engineer to research, test, evaluate and design:
  - transmission equipment, cable, passives, power supplies
  - headend, microwave, TVRO, video, data transmissions
  - converters, (de)scramblers,

addressable terminals

— new and current communication needs and concepts, services and products

### II. A Field Engineer to:

— conduct plant testing and assist in recommendations for large system rebuild  
— implement new projects including site selection for TVRO, microwave and headend installations.

Coaxial Communications, located in east Columbus, offers a competitive salary and benefit package as well as the opportunity for personal and professional growth. If interested in either of these positions, write or call:

Lynn Skinner  
Personnel Manager  
Coaxial Communications  
3770 E. Livingston  
Columbus, Ohio 43227  
(614) 236-1292

### Chief Technicians

Centel Cable Television Company of Illinois, a growing division of Centel Corporation, is currently seeking 2 Chief Technicians to contribute to state-of-the-art cable systems in the Chicago South Suburban and DuPage county areas.

The qualified candidates will possess a FCC first class license or equivalent, administrative as well as technical experience, good managerial skills and organizational ability. You will also be thoroughly familiar with sweep and balancing, experienced in Headend maintenance and conducting Proof of Performance.

In return, we offer a good starting salary and outstanding fringe benefits package. Please send resume, along with salary history and requirements to: Annmarie Utroska, Centel Cable Television Company of Illinois, 1030 North Avenue, Des Plaines, IL 60016, Equal Opportunity Employer m/f

## FOR SALE

### FOLLOWING TOCOM CONVERTERS FOR SALE, WORKING ORDER

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
	<b>DUALS</b>	
36	H-2 / I-1	4

### CONTACT:

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

### FOR SALE

200 Ch. H to 3 and 100 Ch. G to 4 Oak Econocodes, new - in original cartons. Will pay shipping. Call Phil Ressler, Cable Associates, Inc., (717) 299-0781.

### FOR SALE

70 ADS (formerly SKL) Model #7300 30 V. Line Extenders. Lots of 10 — \$40.00 each. All units working — we're expanding to 36 channels. 7300's pass 220 to 230 MHz.

Com-Tel, Inc.  
Box 98  
Menomonie, Wis. 54751  
(715) 235-3211

There is  
room for you.

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- 1.) Systems — paying regular monthly dues based on number of system subscribers.
- 2.) Associate Members — pay an annual fee.
- 3.) Individual Members — pay an annual fee.

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

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

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

# THE GREAT TAP TEST.



## COMPARE THESE FEATURES

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	EAGLE	R	M	J
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Available With Brass F Ports	✓			
Made in USA	✓			✓
All Ports Numbered For System Audit	✓			
Lowest Insertion Loss	✓			
Epoxy Base Protective Coating	✓			
All Ports Can Utilize Traps	✓	✓		✓
Fits in 4" pedestal (2 & 4 way taps)	✓	✓		✓
Sand Bond Finish On Hardware	✓			✓
*Published Cost 4-Way Taps (Lot of 2,000)	\$7.00	\$9.99	\$8.00	\$8.25

\*CE-D Product Profile November 1981

Manufacturing quality products that perform beyond the competition is tradition at Eagle.

The proof is in the comparison. Spec by spec, feature by feature, our 500 MHz taps far exceed the competition.

Compare our 500 MHz taps for yourself. You'll find there's no compromise when it comes to quality at Eagle.

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