A DECADE OF PROGRESS
cata

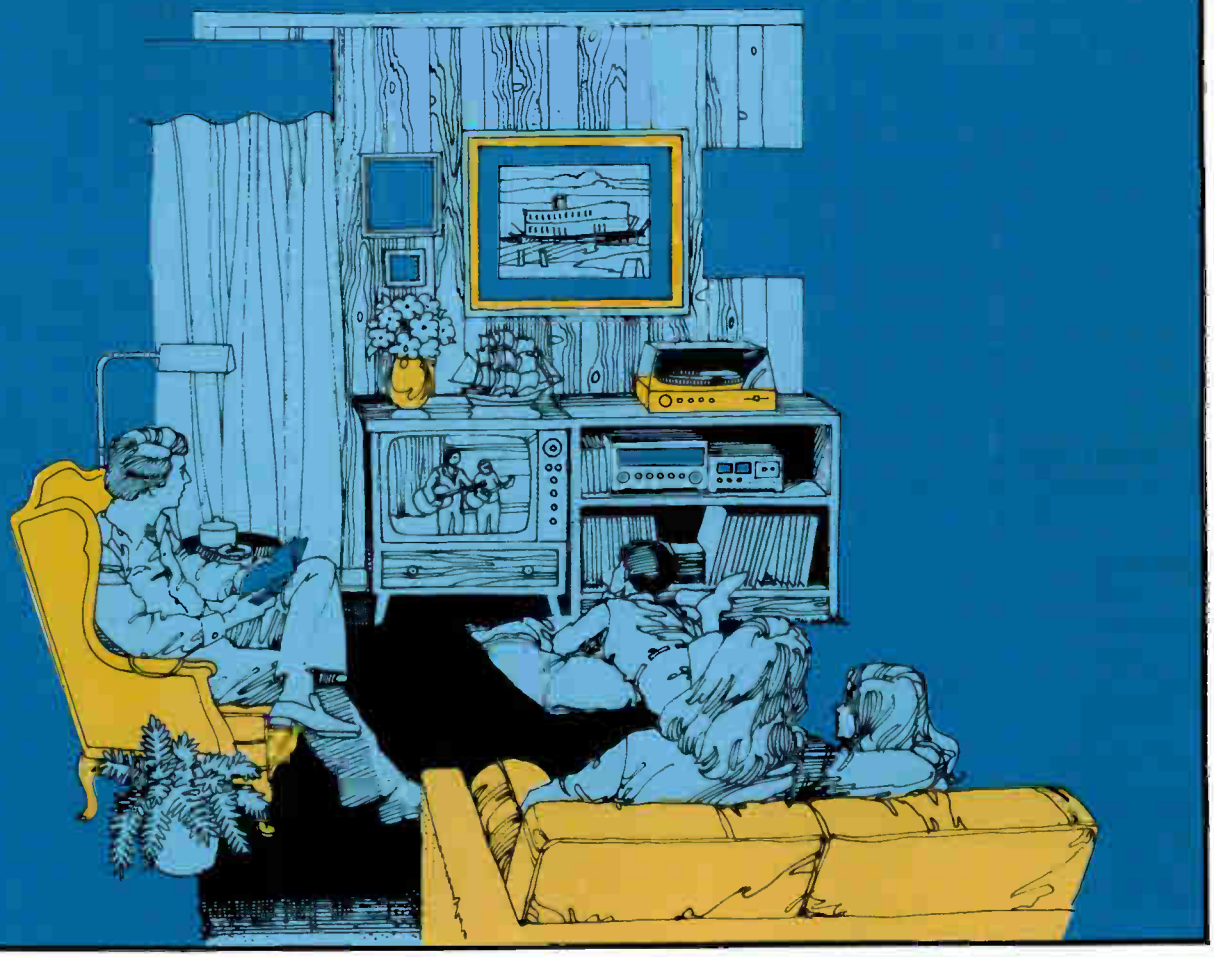
CATJ

OFFICIAL JOURNAL OF THE COMMUNITY ANTENNA TELEVISION ASSOCIATION
AUGUST 1984

Parental Viewing Control

Control

Control



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CATJ VOL. 11 NO. 8

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

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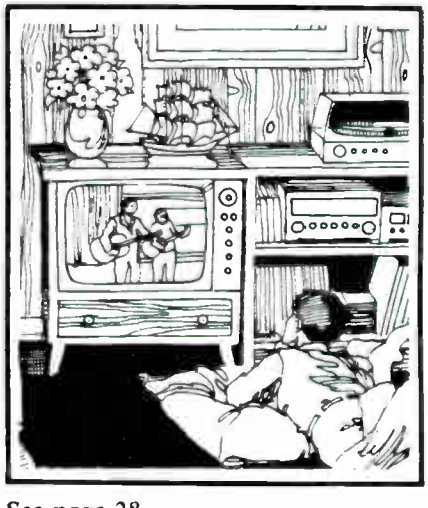

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ABOUT THE COVER

One of the growing concerns of parents in this country is the selection of television programming for their children, and this month's cover draws attention to Glyn Bostick's article on Parental Viewing Control equipment.

NEWLY ELECTED CATA OFFICERS AND DIRECTORS

CARL AND ARDITH SCHMAUDER

Carl Schmauder, newly elected President of CATA to serve a two-year term, is a long-time CATA member, having served on the Board for many years. His committee assignments have been varied, with the most recent being Chairman of the Long-Range Planning Committee and a member of the Executive Committee.

Editor's Note: Because CATJ press time fell immediately after CCOS '84, there was not ample time for the newly elected CATA President, Carl Schmauder, to prepare the editorial regularly found in this section. We look forward to beginning his presentations with the next issue and offer our best wishes for a successful term as CATA President.

Congratulations are in order for the following Officers and Directors of the Community Antenna Television Association, newly elected at the Annual Membership Meeting, July 16, 1984, Tan-Tar-A, Osage Beach, Missouri.

Officers

President	Carl Schmauder Lincoln City, Oregon
Vice President	Jim Hays III Irvine, Kentucky

Directors

District #5	Woodrow McHargue Princeton, Missouri (Vice Director) Dean Peterson Carthage, Missouri
District #9	Jeff Krumme Tulsa, Oklahoma (Vice Director) Charles Haley Canton, Mississippi

The above newly elected join with the following to complete the slate of officers and directors:

Secretary/Treasurer and Director-District One	Clarence Dow Caribou, Maine
District Two	Michael J. Rigas Coudersport, Pennsylvania
District Three	David Fox Gilbert, West Virginia
District Four	John Rhinehart Murfreesboro, Tennessee
District Six	Wayne Sheldon San Jose, California Lee Holmes (Vice Director) Agana, Guam
District Seven	Carl Schmauder Lincoln City, Oregon
District Eight	Virgil Mehus Rushford, Minnesota
District Ten	Jim Hays III Irvine, Kentucky □

BULLETIN:

CATA WITHDRAWS SUPPORT FOR H.R. 4103 URGES NEW EFFORT TO ACHIEVE LEGISLATION

The Board of Directors of the Community Antenna Television Association announced at the conclusion of its annual Board Meeting that the Association was withdrawing its support for H.R. 4103, the cable deregulation legislation currently pending in the U.S. House of Representatives. The Board stressed that its decision related solely to the legislation as currently written, and was precipitated by the massive change in the regulatory environment regarding cable television caused by the recently announced decision of the Supreme Court in Capital Cities Cable, Inc., v. Crisp.

The Board further noted that it continues to support the longstanding cable industry effort to have Federal deregulatory legislation enacted. The Community Antenna Television Association is urging all interested groups involved in that effort, as well, of course, as Members of Congress, to continue the legislative drafting process. The present draft, however, was considered unacceptable, particularly with regard to rate and content regulation, and access by cable systems to potential subscribers. The Board also noted that there was a need to clarify Congressional intention in several sections of the bill, especially those dealing with franchise renewal. □

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The Community Antenna Television Association, Inc. is a nonprofit organization formed under Chapter 19, Title 18 of the Statutes of the State of Oklahoma. As such, no part of its assets or income shall be the property of its members, such assets and income shall be devoted exclusively to the purposes of the Corporation.

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USING THE SIGNAL LEVEL METER AND A

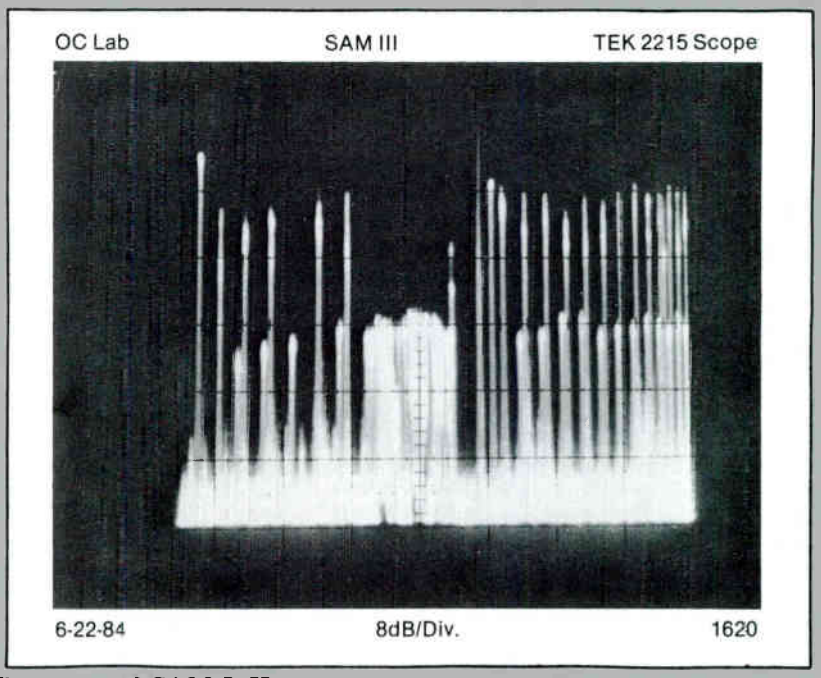
Larry Flaherty
Quality Control Engineer
Rogers Cablesystems
Cablesystems Engineering Division

demodulated baseband video waveform.

2. **Rate** - Setting of this control determines the (rep. rate) recurrent sweep time across the screen of the scope. A too slow of sweep rate is difficult for the eye to follow, but a too high of sweep rate causes what is commonly called "scan loss." This is a loss in **amplitude** and **waveform distortion.** So try to adjust the sweep rate to a point slow enough to be usable.
3. **Center Frequency** - The center frequency may be read off the tuning dial **with** the **dispersion control set to minimum** for maximum accuracy.

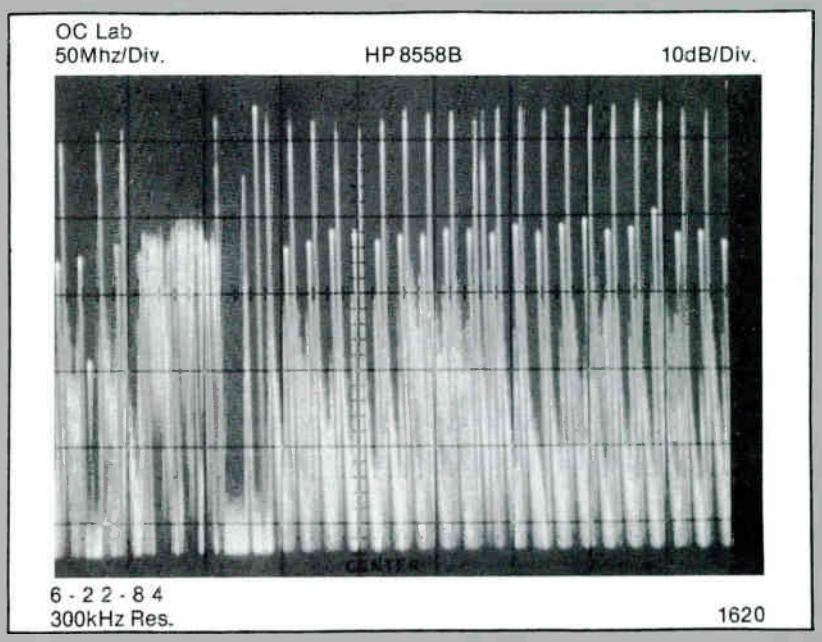
AMPLITUDE RANGE

This is the "Y" axis on the scope screen (vertical) and is the dynamic range of the system. This parameter is totally controlled by the spectrum analyzer design and is not limited by the osciiloscope. The Sam signal level meters have a dynamic range of 40dB and they are logarithmic. Thus, it can be said that each vertical gradicule on the scope screen of the LB0-308S or Tektronix, Model #2215 is equal to 5dB. This measurement accuracy is within 5% when the Sam and scope controls are set as in the following operating instructions. The error presented is well within normal usage, but not quite acceptable for F.C.C. measurements.



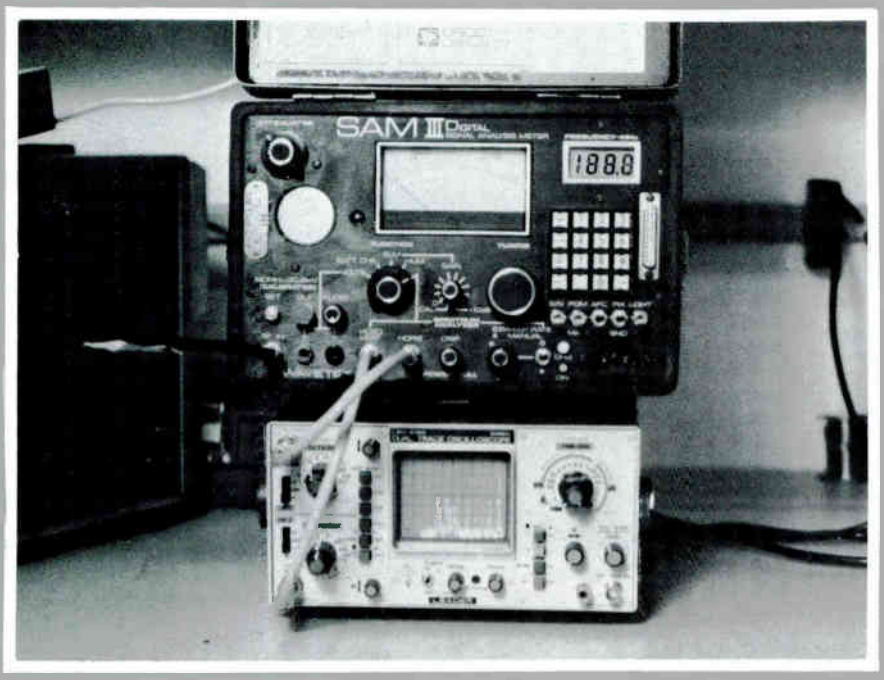
The proposed SAM I, II or III in conjunction with the Tektronics 221S Oscilloscope

The difference in the displays is due to the calibration between the two units; 8dB per division on the above and 10dB per division on the lower.



HP 8558B Spectrum Analyzer

NOTE: Remember: the purpose of this comparison is not to compare quality, but to compare usability. ►



WAVETEK'S SAM III AND LEADER'S LOB - 308S OSCILLOSCOPE

FREQUENCY RANGE

This is the "X" axis on the oscilloscope screen, and by the adjustment of the dispersion control, the frequency span of about 10KHz to 350MHz can be obtained. This control is variable so that the frequency width viewed may be narrowed or expanded as desired.

FIELD USE

The Wavetek Sam I, II or III signal level meter in conjunction with the battery operated Leader LB0-308S oscilloscope provides an inexpensive spectrum analyzer for viewing TV video and aural signal levels at a glance. By observing the relative levels of the TV signals, the cable distribution systems may be examined, not only for level response, but also for interactive signals that may cause picture beats and distortions. The FM system can also be evaluated for ingress and off air pick-up. "B" trunk" egress is still another use for this spectrum analyzer combination. Also, the Sam 150MHz calibration can be fed into the system for a calibration source.

The approximate cost of the Leader LB0-308S is $1,000.00 and will substitute as a quality bench scope. The Wavetek Sam I spectrum analyzer retro-kit is approximately $100.00 and included in the Sam II or Sam III.

The Tektronix, Model #2215 is not available with batteries, but could be used with an "AC" generator or inverter if needed for field use.

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COMPANY _____

☐ CABLE TV SYSTEM
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SIGNAL LEAKAGE LOG

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

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

$10.00 FOR 5 PADS

Each pad is three hole punched for easy insertion into a binder.

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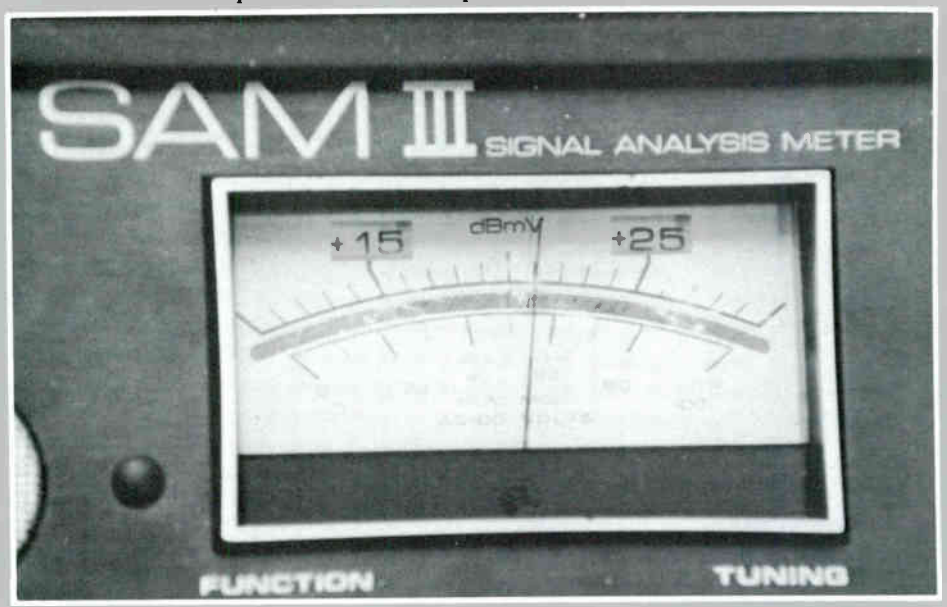
STEP-BY-STEP OPERATING INSTRUCTIONS FOR THE WAVETEK SAM I, II OR III AND LB0-308S OR TEKTRONIX, MODEL #2215 SPECTRUM ANALYZER COMBINATION

1. Connect the following cables on the Sam SLM to the "0" scope as follows: (Refer to drawings and pictures on previous pages.)
   A. "Video vert." out to scope Channel 2 "Y" input.
   B. "Horizontal" out to scope Channel 1 "X" input.
   C. "Input" to the RF input on the Sam SLM (System Signal Input).
2. Set the "0" scope controls as follows:
   A. All vertical mode switches in the out position.
   B. All horizontal mode switches in the out position.
   C. Time base control set to the X-Y position.
   D. Both inputs set to the DC position.
   E. Channel 1 volts/Div. Control
      1. .5v/div.
      2. Uncalibrated.
   F. Channel 2 volts/Div. Control
      1. .2v/div.
      2. Calibrated.
3. Set the Sam SLM controls as follows:
   A. "AFC" switch to the "on" position.
   B. On Sam II or III program, switch to manual.
   C. Function selector to the "SLM" position.
   D. Sweep or manual switch up or 0.



ADJUST THE SAM ATTENUATOR, TO INDICATE AS ABOVE, A NEAR CENTER NEED READING.

Continued on page 18

SPECIAL PROGRAM OFFERED TO TECHNICIANS DURING 1984 EASTERN SHOW

The Southern Cable Television Association is offering a special registration program for system technicians and engineers for the 1984 Eastern Show, the cable industry's largest gathering east of the Mississippi.

Every cable system who has registered at least one person for the full convention held September 6-8, will be able to purchase Saturday daily registrations for technicians for only $10.

The 1984 Eastern Show features one of the most informative line-ups of Technical Sessions offered anywhere. Under the direction of Harold R. Null, a 30-year-old cable industry veteran and Vice President of Engineering for Storer Communications, all of the sessions are geared to yield useful, productive information for the system engineer and technician.

Panelists and topics include W.C. Margiotta, Product Marketing Manager Special Program for Hughes Aircraft Co., speaking on "Data Transmission Via Cable, Microwave and Satellite"; Allan Kushner, Vice President of Times Fiber, speaking on "Addressability On and Off Premises"; Michael Hayashi, Sales Engineer Manager for Pioneer, speaking on "Signal Security"; Richard Thayer, Vice President of Cable Television Engineering for Times Fiber, speaking on "Utilizing Existing Cable in Upgrades and Rebuilds"; Rex Porter, Vice President of Sales and Marketing of Gilbert Engineering, and John Carlsen, Manager Strategic Marketing CATV of Raychem Corp., speaking on "Connectors and Repair Kits for Cable"; Jay Staiger, Product Manager Amplifiers of Magnavox, speaking on "RF Amplifiers Feedforward and Power Doubling" and Larry Richards, Manager of Technical Services for Magnavox, speaking on "Proper Testing of System Components, Before and After Installation."

Each technician or engineer registering under the special registration offer will be entitled to attend the Saturday session on "Proper Testing of System Components" and have full access to the Trade Show floor, to view the largest display of cable hardware and services in the eastern half of the nation.

For further registration information, contact Convention Show Management - (404) 252-2454.

1984 EASTERN SHOW INFORMATION

ASSOCIATION

The Southern Cable Television Association (SCTA), which sponsors The Eastern Show, is made up of 11 southeastern states, including Alabama, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.

DATE

The Eastern Show, a three day trade show, is slated for Thursday, September 6 - Saturday, September 8 at the Georgia World Congress Center in Atlanta.

SEMINARS

The Eastern Show is offering concurrent management/technical seminars. The Cable Television Administration and Marketing Society (CTAM) is producing the management and marketing sessions. Technical seminars are under the direction of Harold Null, Vice-President of Engineering for Storer Communications.

ACTIVITIES

Neil Sedaka will be the entertainer at the gala banquet. Pre-convention activities include the fourth annual Wometco Golf Tournament and several hospitality suites.

REGISTRATION

Contact Convention Show Management for further registration or exhibit information. (404) 252-2454.

letter to the editor

Dear Celeste:

Just a brief note to tell you how honored I felt to be selected for the feature profile in the CCOS - 84 issue of CATJ. A special tip of my hat to Kay Sheldon for the difficult task of trying to get a composite of me and my personality down on paper. I can assure you that it was not easy. Yet, somehow, I feel that it all came out as close to the "real" me as anyone could possibly get — serious about the cable industry, even more serious about the need for the technical training seminars and the tremendous amount of self satisfaction I had from doing them, a good mix of humor, and a touch of magic.

A humble thank you to Southern Satellite Systems for their many kind words. Their Congratulatory message was a most pleasant surprise. If I have actually managed to accomplish anything that can be regarded as a positive contribution in their eyes, or in the eyes of my other friends and aquaintances in the industry, let me assure you that it has been my pleasure.

My Very Best Regards,

Ralph A. Haimowitz
Director of Engineering

Growing bigger shouldn't make your signal grow weaker.

Upgrading seems to be the name of the game these days. But upgrading and expanding your system shouldn't mean loss of signal or extended down time, or expensive outlays of capital, either.

The answer to all of the above problems lies in Standard's unique *loop-through* feature.

Instead of replacing your present 4-way splitter with an 8-way splitter, thus attenuating your signal output by half, Standard's loop-through feature allows you to maintain full power as your system expands.

All that's required is a one-port jumper from your present splitter to our *Agile 24M* master receiver.

Through the use of our active loop-through design, up to 100 Agile 24S slave units can be driven from a single Agile 24M and no external power dividers are required.

Your alternative to Standard's loop-through design is a power divider system which results in a reduced signal level when it's divided amongst each receiver. Or, you may be forced into a much more expensive 4 GHz amplifier/divider to make up for the signal loss to each receiver. The Agile 24 eliminates both of these unsatisfactory alternatives.

System Design

The Agile 24M is a complete 24-channel dual conversion, 4 GHz input receiver that block-down converts to 760-1260 MHz. Then, through the active loop-through design, this IF is supplied to the Agile 24S.

A temperature-stabilized dielectric resonator oscillator (DRO) in the down converter, combined with a synthesized L.O. and an effective AFC circuit, ensures rock stable operation. In areas where microwave interference is a problem, optional 60 MHz and 80 MHz filters can be easily installed.

An inexpensive plug-in simultaneous second audio board is also available.

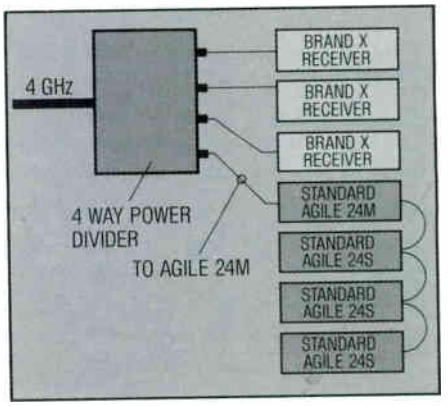
Installation, Test and Maintenance

The Agile 24 M/S series features a low-profile 1¾" chassis designed to occupy a single standard rack space. The front panel includes three-function meter displaying signal strength, C/N and center tune, convenient front test connections and all normal performance adjustments, as well.

A ONE YEAR WARRANTY

A new replacement program to our existing one-year warranty allows for a failed unit to be replaced within 48 hours.

All it takes is a simple phone call, and an immediate replacement is on its way, thus avoiding down-time.



Also, our new post-warranty for years two through five allows for speedy replacement at a total cost of only $100 plus freight.

Standard Communications is ready to help improve the quality of your system right now. And to position you to expand without losing efficiency. For full information on Standard's complete line of TVRO components, call direct, (800) 421-2916 or (213) 532-5300, or mail the coupon below.

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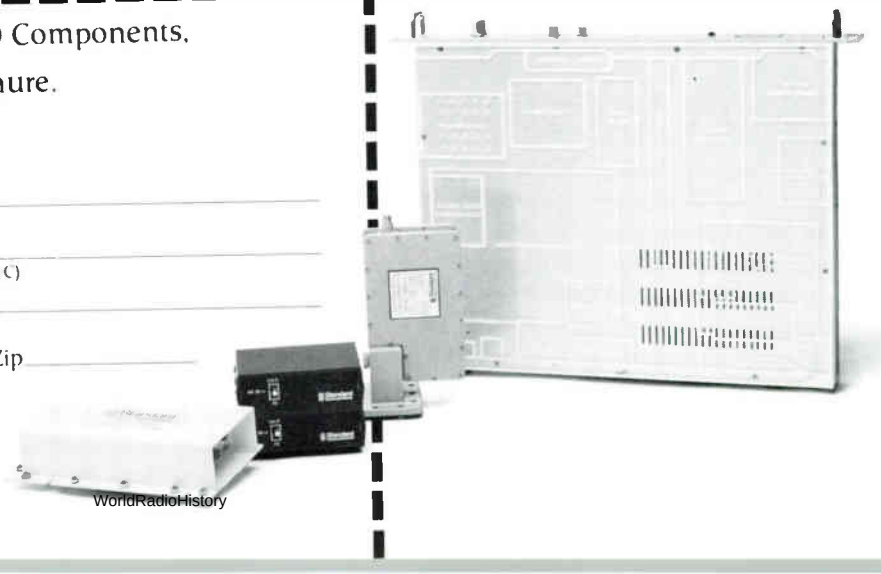
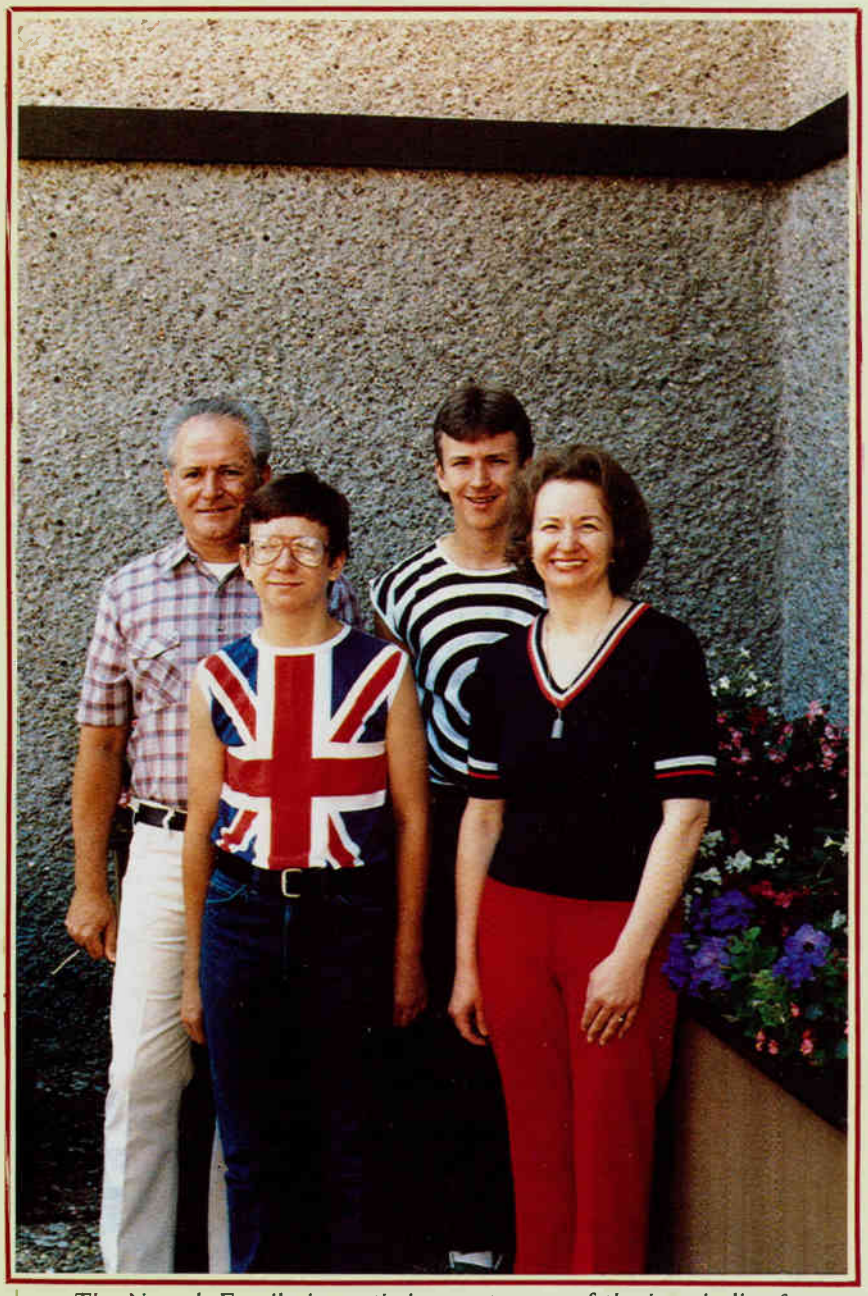


by Kathleen Sheldon



The Nowak Family is on their way to one of the hospitality functions at CCOS — John, Jeff, John Jr., and Connie.

John Nowak

A Complete Cable Man

John Nowak will be playing "catch up" now that he has sold his cable television system. "I've let some things go the past years," he says. "There' some work I planned on doing at home. I don't see having any problems keeping myself busy." A soft laugh creeps in behind his words. He adds that there are a number of interests he has been looking into and considering, but that he will take his time making up his mind which to pursue after he has had time to catch up on some important things that were put off during recent years.

John is a soft spoken, reserved person. He describes himself as shy, quiet, and as a person who doesn't like to burden others with his problems. "I realize I'm the one that has to work them out," he says.

He likes to keep busy, and busy he has been during his twenty years building and operating Bellaire Antenna Systems, Inc. which provided cable service to 3100 subscribers in Bellaire, Neffs, and Glencoe, Ohio. These communities, in the Ohio Valley, have very poor off the air reception. He first became aware of the infant cable television industry while working for RCA and staying in Cambridge, Ohio, at a motel that was serviced by a cable system.

"While home one weekend," he says, "a neighbor approached me about repairing a home type booster amplifier and asked if it would have enough gain to drive signals down a nearby hill if an antenna was located there. That started me thinking about the system in Cambridge."

John and his brother checked around and looked into how cable systems in nearby communities were put together. They were interested in the potential of the business, but he says, "Shortly afterwards I got layed off at RCA and went to work for Industrial Nucleonics, a Columbus, Ohio company. . . . I was doing field service and applications work for them throughout the New England states." This wasn't the best circumstances under which to take on the responsibility of build-

The Nowak Family has integrated a family vacation into the CCOS schedule each year, and enjoyed the cruise on the S.S. Emerald Seas to Nassau.

Renewing friendships with other CATA members who have attended CCOSes in the past is something to which the Nowaks look forward. John and Connie are visiting with Steve and Jewell Bell, Dexter, Missouri, in one of the hospitality suites, and catching up on the past year!

ing a cable system in spare time. John says, "We decided it was too risky, and besides we didn't have the money."

Four and a half years later John, his brother, and his brother-in-law pooled their resources and went to the City of Bellaire, John's hometown, for the franchise, and construction began in 1964. The following year John's brother went on his own, and John and his brother-in-law continued the business, completing the system in 1968. Seven years ago John bought out his brother-in-law's interest and began operating the business alone.

John says he has "worked in all areas of CATV — laborer, block layer, concrete finisher, tower climber, pole climber, cable splicer, equipment installer, drop installer, plant layout, plant construction, bench maintenance and alignment, system management, bookkeeper, floor sweeper, etc." Sounds like a typical list for a small system operator!

While he was busy with all this, other cable systems were being built and put into operation in neighboring towns. TCI bought their first system in the area ten or eleven years ago, and, at that time, they expressed some interest in John's system, but he didn't want to sell. Five or six years ago TCI purchased the system in Wheeling, West Virginia, which is located just three miles north of Bellaire, across the Ohio River and state border. The Wheeling system is the largest in the area, and in addition to that system, TCI either bought or built systems in all the rest of the surrounding towns. Several times they contacted John about buying him out if he decided to sell.

"Five years ago . . . I didn't see any problem with competing in this area," says John, but since the satellite services have become so popular . . . I saw it was going to be difficult to compete."

A large MSO, with a strong negotiating position, is able to buy programming services at a lower rate than a small independent operator. John says that while the prices for premium services are relatively fixed, a big MSO has an advantage when it comes to acquiring some of the so called basic networks.

"People aren't very forgiving or understanding, if you charge extra for a service when, in a neighboring community subscribers get it with the basic charge," says John. ►

He says he sees no need for a change in CATA's focus, and adds that he hopes the association doesn't "forget (the) wants and needs of the systems that made CATA what it is."

John L. Nowak was born in Bellaire, Ohio in the mid 1930's "into a poor, coal mining family," he says. His father and mother were born in Poland and lived and were married in Germany. John, born several years after they immigrated to the United States, is the middle child, and has three brothers and one sister. His father died when John was a freshman in high school. He carried newspapers while in grade school, worked on a milk truck, and then at a service station when in high school. He played in the high school band. After his graduation, he joined the Navy. Later he worked for RCA and Industrial Nucleonics before going into the cable television business. While at Industrial Nucleonics, he received special recognition for isolating a variable not previously known about in an electronic circuit.

John was already in the cable business when he met his wife Connie at a polka dance. Soon after they met he needed someone to work in the office and hired her. "I didn't realize it was going to turn out quite so nicely for me," says Connie. "Sometimes I think it was just my luck to be in the right place at the right time. I feel so blessed."

John likes to tease Connie by saying that after they had dated for a year and a half "she convinced me we had a lot going for us, so we got married." Connie continued to work in the office after their marriage up until two days before the birth of their first son, John Jr. Her "retirement" didn't mean she really got away from involvement in the cable business, since many of their business calls came to their house and John included her in business discussions and decisions.

The next year their second son, Jeff, was born. The boys' interests, says Connie, are typical of teenagers everywhere. John Jr., who will be a high school sophomore this year, is a sports enthusiast and likes to play basketball and football. Jeff, who is artistically talented, will be a freshman this year. Both boys enjoy summer swimming and going on family vacations, including attending CCOS and their annual trip to Myrtle Beach, South Carolina. They all like summer activities they can do together as a family, "such as (going to) ethnic festivals in the area which have music and good food," says John. He adds, "I always felt uncomfortable leaving the system, knowing that the guys left behind did not know the system totally. I never totally relaxed." This is a concern of the past now that he no longer operates the cable system.

John was particularly touched several years ago when his sons presented him with the "World's Greatest Father" award on Father's Day. Connie says it was a spontaneous presentation, the result of "a feeling that came from within (the boys.) It happened to be an opportune time for a summed up feeling they had about him . . . It's the daily things that make him the best father to them. He's a father that spends time with them."

When asked what his favorite possession was John said, "My concertina." Then he added, "I would say my wife and two sons, but they really aren't my possessions, are they?" His answer demonstrated the basic humanness and kindness of this man who cares so much for his family, yet knows he doesn't own them.

The concertina is the German style which is larger and shaped differently from the more common type often used in movie scenes. John has a wealth of information about the history and workings of this instrument and likes to tell about it. This reed instrument was patented by Sir Charles Wheatstone in 1829, the same man noted for the "Wheatstone bridge." Chords on John's German style concertina are played with combinations of three keys (buttons) on the left hand end of the instrument while the melody is played with the buttons on the right. Unlike similar instruments, each key is a different note when the bellows are compressed than when they are stretched. John likes to play polkas, waltzes, and obereks on his concertina. "That's the Polish in me," he says. He and Connie enjoy dancing to this lively music at the ethnic festivals and other events they attend whenever possible.

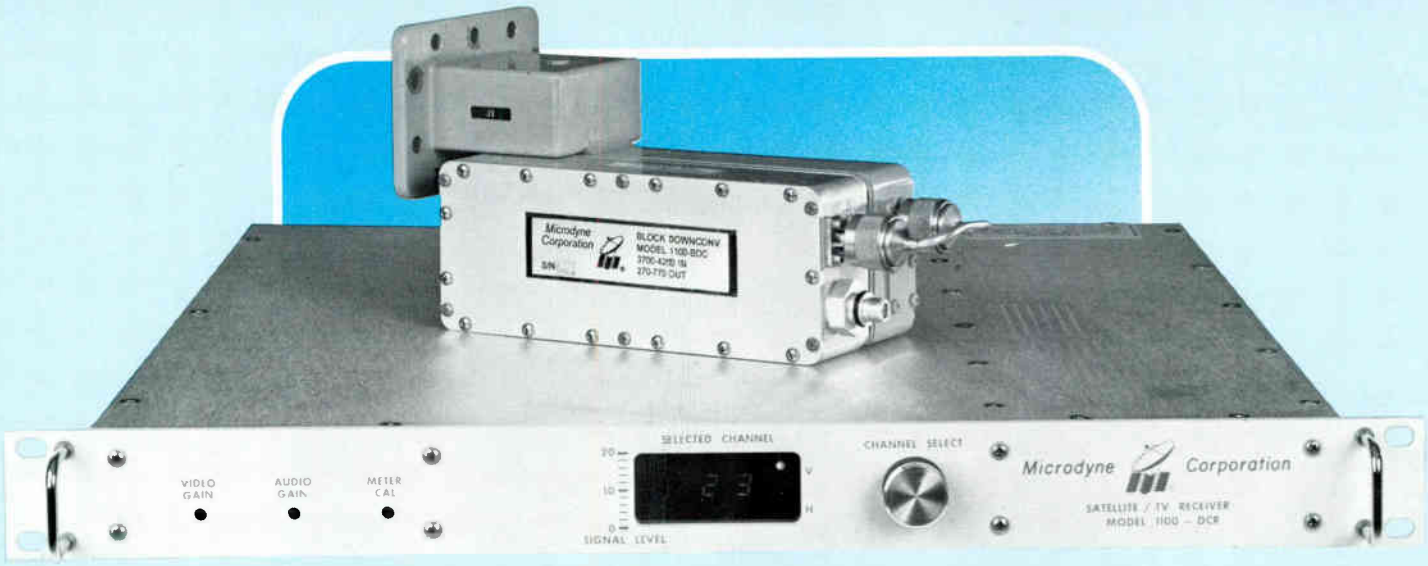
John and Connie are strong supporters of community events and never miss the school activities of their sons. John is a director of the Bellaire Area Chamber of Commerce and is treasurer and a director of the Polish Home Builders Association. He and Connie and the boys attend St. John Church in Bellaire, and John is on the Church Parish Council. He also serves as a member of a core group that plans, organizes, and supervises youth activities for the St. John Church youth group.

His reading interests include information on practical economics. He says, "I am concerned about our economy. This is something we are not taught in high school, yet we have to survive in an economic system we know little about." One of his recently developed skills is the use of computers. He likes working with business and analytical programs.

Even though there is a lot of manual labor involved, John finds relaxation working in the family vegetable garden. He says that while he's down on his knees in the garden he finds that is a convenient time for prayers. Throughout the growing season he produces an ample supply of fresh corn, beans and tomatoes. What the family can't eat is frozen for later.

John is a quite, modest person who is instantly liked by those who meet him. He is considerate, thoughtful, and generous. He has a reputation of dealing fairly with others, looking at the other person's point of view, and being conscientious in his actions with family, friends and acquaintances. Some of his basic, down to earth philosophy was evident when he was asked what he would like to see in an article about him.

"This is not a 'me' industry or a 'me' world," he said. "What I contributed is little, what 'we' contributed is a lot. It will be a better world if 'we' can make it that, because 'I' cannot do it alone." □



Microdyne's 1100 BDC Block Downconverter and 1100 DCR Receiver

Now — Lower your headend costs and increase system margins with Microdyne's C-Band Block Downconverter

If you're planning on carrying a lot of satellite TV channels simultaneously, we can reduce your cabling and headend equipment costs while increasing your system margins.

Our 1100 BDC reduces the 4 GHz satellite signal to the UHF range right at the antenna. That means you can use lower-cost 75-ohm cable and fittings for the run to the headend.

And because of the lower frequency there's less line loss, so you can make longer cable runs and still have high system margins.

More channels equal more savings

Once at the headend you can use less expensive power splitters, again because of the lower frequency. And if you're carrying a lot of channels, you know that the cost of splitters can add up quickly. With our block downconverter, the more channels you carry, the more money you save.

Teamed with our best LNC Receiver

We teamed our state-of-the-art block downconverter with an equally advanced receiver — the 1100 DCR. Standard features include a PROM-controlled double-conversion frequency synthesized tuner for the best possible image rejection, noise figure and temperature stability; automatic polarity switching; and remote control capability.

Compatible with S-A Receivers

We don't usually mention the names of our competitors in our ads, but in this case it's appropriate. Our 1100 BDC block downconverter is a direct replacement for Scientific-Atlanta's 360 Series and can be connected directly to S-A's 6650 receivers.

So if you have been having trouble getting an S-A block downconverter, use ours. We don't mind if you mix brands — it just may convince you to try the rest of our TVRO equipment.

Backed by Microdyne

Of course the 1100 BDC and 1100 DCR are backed by our generous service policy and comprehensive customer support. And they are readily available through our nation-wide system of Authorized Distributors.

If you would like more information on how our C-band block downconverter can help save you money, contact our Marketing Department today at (904) 687-4633. Ask for our new TVRO brochure. We'll send it to you free, along with the name of your nearest Microdyne distributor.

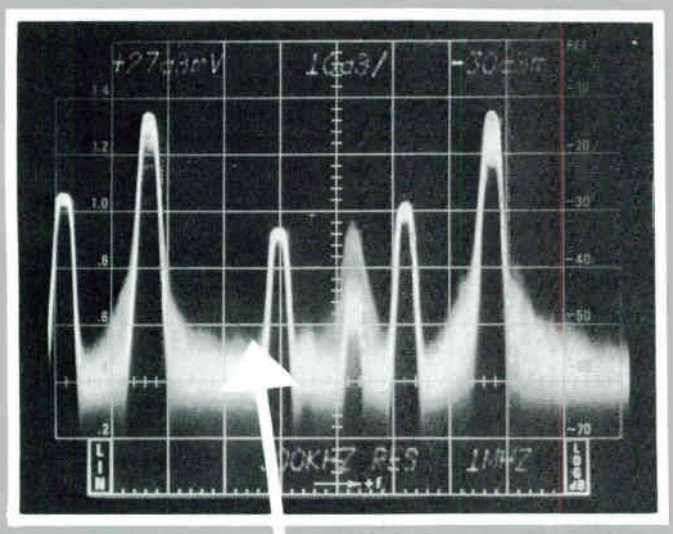
Microdyne Corporation

P.O. Box 7213 • Ocala, FL 32672 • (904) 687-4633 • TWX: 810-858-0307

Continued from p. 9

THE SAM IN THE SIGNAL LEVEL MODE TUNED TO CABLE #6

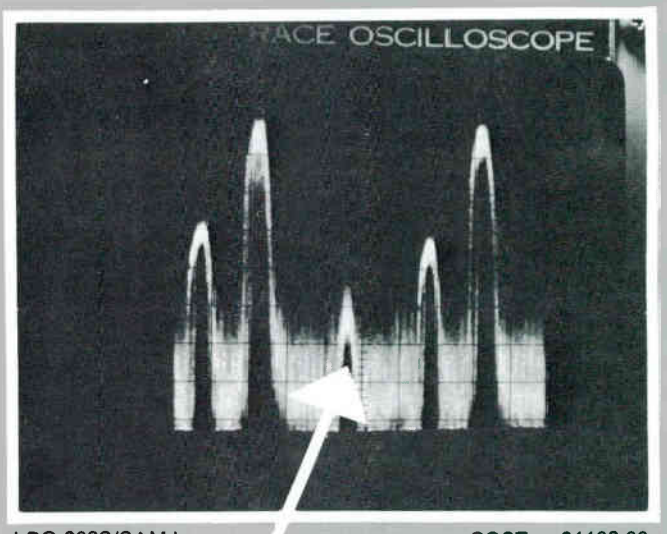
4. Turn on the Sam SLM and read the signal level on Cable #A. (Any)
   A. Attenuator control for approximate center of meter reading (see photo).
   B. Upon completion of above, turn the function selector switch to the spectrum analyzer mode.
5. Turn on the "0" scope.
   A. Adjust the "X" and "Y" controls to center display proportionately.
   B. Adjust the Channel 1 "X" volts/div. control for the display to go to the left hand edge.
   C. Adjust the Channel 2 "Y" volts/div. control for a full scale display.
6. Adjust the tuning control to a known frequency carrier in the center of your spectrum, such as Channel "A" or cuckoo pilot.
7. Turn the dispersion control (Sam SLM) counterclockwise to zero (0) scan.
8. Adjust the tuning control to peak display and read known frequency on the "LCD" readout on the Sam SLM dial or LCD display.
9. Adjust the dispersion control clockwise to the desired display; the known carrier should be on the center gradicule, if not, center with the scope X-Y centering control (see photo).
10. To view other portions of the band, keep turning the main tuning control and the vaneier dial to the desired frequency.
11. To read the proper frequency on the Sam II or III "LCD" readout, return the dispersion control counterclockwise to zero (0) scan, and peak the display.
12. By using the Sam tuning control, scan all channels for any beats or irregularities.
13. To calibrate for 1MHz/div., adjust the Sam SLM dispersion control to equal six (6) divisions horizontally between two (2) of your 6MHz spaced channels.
14. Adjust the Channel 2 "Y" volts/div. control so the average channels will peak on the top gradicule of the "LB0-308S."
15. When reading vertical calibration with Channel 2 "Y" volts/div. control in the .2v/CM position, this is equal to .5dB/CM vertically.



COST = $14,000

7L12-7K11 TEKTRONICS SPECTRUM ANALYZER

Beat 20db down

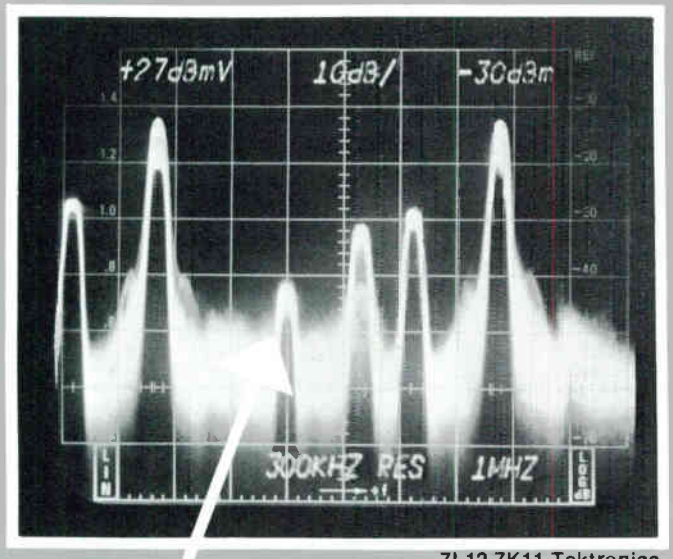


LBO-308S/SAM I

COST = $1100.00

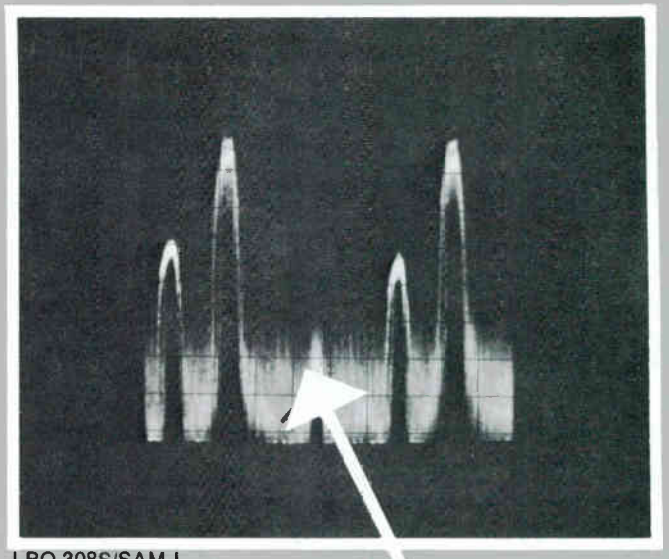
Beat 20dB down*

***color burst rolled off due to high freq. (3.58MHz) in the SAM I.**



7L12-7K11 Tektronics Spectrum Analyzer

Beat 30dB down



LBO-308S/SAM I

Beat 30dB down*

16. To check for relative pilot levels, set the dispersion control for 6MHz/Div. and adjust the tuning control across the band for viewing the level peaks and any possible beats.
17. If there is a need to verify signal levels, return to the Sam SLM position and read the level off of the meter.
18. This procedure can be accomplished with either the Sam I, II or III with a spectrum analyzer mode option.

NOTE: Basically, one has conceived the higher grade unit offered by Wavetek. □

Tan-Tar-A — a lovely approach to a beautiful setting.

CCOS '84 is now history, joining the succession of past memorable CATA meetings with 540 persons registered from the operators, suppliers, and families groups.

At this meeting, Peter Athanas turned the President's gavel over to incoming President, Carl Schmauder, at the CATA Tenth Anniversary Breakfast held on the last morning in the Parasol Room at the Marriott's Tan-Tar-A Resort in Osage Beach, Missouri.

Mr. Schmauder has thirty years of cable television experience under his belt, beginning as a part-time employee in 1954, and working full time as an installer in 1956. Two years later, he bought into the system and has been General Manager and Technician of the company since 1958. His system is Lincoln Cable Systems Limited, serving 6400 subscribers, located in Lincoln City, Oregon. Carl is a long time member of CATA, the CATA Board of Directors, and is Past President of the Oregon Cable Association.

Other officers elected at this year's meeting are:

Vice President - Jim Hays III (Kentucky)

Secretary/Treasurer - Clarence Dow (Maine) - for a second term

New Directors elected are the following: to represent District Five is Jeff Krumme, Tulsa, Oklahoma, with Charles Haley, Canton, Mississippi being elected Vice Director; to represent District Nine is Woodrow McHargue, Princeton, Missouri (recently a featured CATA personality in CATJ) with Dean Peterson, Carthage, Missouri, acting as Vice Director.

These officers were introduced at the CATA Breakfast, where Ed Allen, Western Communications, Inc. and newly elected President of the NCTA was the featured speaker, explaining in his remarks the reasons the NCTA had joined with CATA in withdrawing support of the two associations from H.R. 4103.

From the group of cable industry leaders honored for their contribution to CATA during these ten years, the following were present at the breakfast:

Peter Athanas — Carl Schmauder
Chuck Kee — Raleigh Stelle

Others honored at this program were:

Kyle Moore
Bunk Dodson
Bill Risden
Larry Dolan
Gene Edwards
Ben Campbell
Ben Willie
Justin Mueller
David Fox
Bob Welsh

Charter Associate Member Firms

Lynn Watson and Mike Aloisi, Showtime/The Movie Channel engineering personnel, were busy in their Consultant's Corner after their FeedForward session.

Sessions Well Attended and Spirited

As in past years, the meetings featured numerous high-powered, well-presented seminars, offering valuable instruction and information to the attendees. Because of the overlapping arrangement of the sessions, this reporter (and cable office manager) was able to attend only a small portion of the CATA Showcase Programs. However, conversations with other attendees showed that all of the meetings were informative, instructive, and filled with useful information that operators could take home and put into practice in their systems.

The following comments are some observations of those sessions attended, and they show the high quality of the presentations. The only way to get all the information presented is to attend the meetings, and, if you were unable to be there this year, this might be a good time to begin to plan to join the group next year.

Steve R. Effros, CATA Executive Director, moderated a panel titled **"Managing the Legal Mumble Jumble"**, and, as usual, Steve cut through the big words and the legalese to present the information in language cable operators would understand. Panel members were Attorneys Paul Glist and Wes Heppler; Mr. Glist presented information on pole attachments and Mr. Heppler discussed FCC compliance in areas of EEO and Aeronautical Frequency filings. All of this important information was presented to a capacity crowd, attentive to every word.

Peter Athanas, outgoing CATA President, moderated a panel on **"Theft of Service"** problems, with the three panel members offering concrete information and advice for how to deal with this problem. Bill Cologie from the Pennsylvania CATV Association said the cable industry "had left the keys in the car" and then offered suggestions to go from there. He said it is the industry's job to change the public perception that it is okay to steal cable television, and said some of the signs that your system may have a serious theft problem include local ads for illegal converters, unusual churn, and signs of tampering with the system drops. He said it is important to involve employees in the remedy and to enlist the aid of the city council, making the local police department aware of the seriousness of this crime.

Mike Aloisi from Showtime/The Movie Channel said the operator must make the choice of "action or inertia" in dealing with the problem and pointed out that the solution lies with the operator. Mr. Aloisi mentioned that one of the reasons for the delay in implementing scrambling is that there is only one shot at this important step and they must be sure the **best** method is being used.

The Pennsylvania Association has published a manual to aid operators in dealing with the theft problem, and this manual can be purchased by contacting the association. Showtime/The Movie Channel has prepared a Service Combat Kit, containing a six-point program for their affiliates. Get in touch with your regional engineer if you are interested in obtaining one.

The third panelist, Doug Huston from Audicable, Inc., offered sound, specific suggestions on what should be included in an audit and follow-up, emphasizing the value of remarketing services following the audit and disconnection of illegal hook-ups. He said not to lay blame, but to clear up the problem.

Ralph Haimowitz was the moderator of a panel titled, **"What In The World Is Up?"** This session, as in many of the sessions, was a standing room only crowd, even after added chairs were brought in to supplement the ones in place.

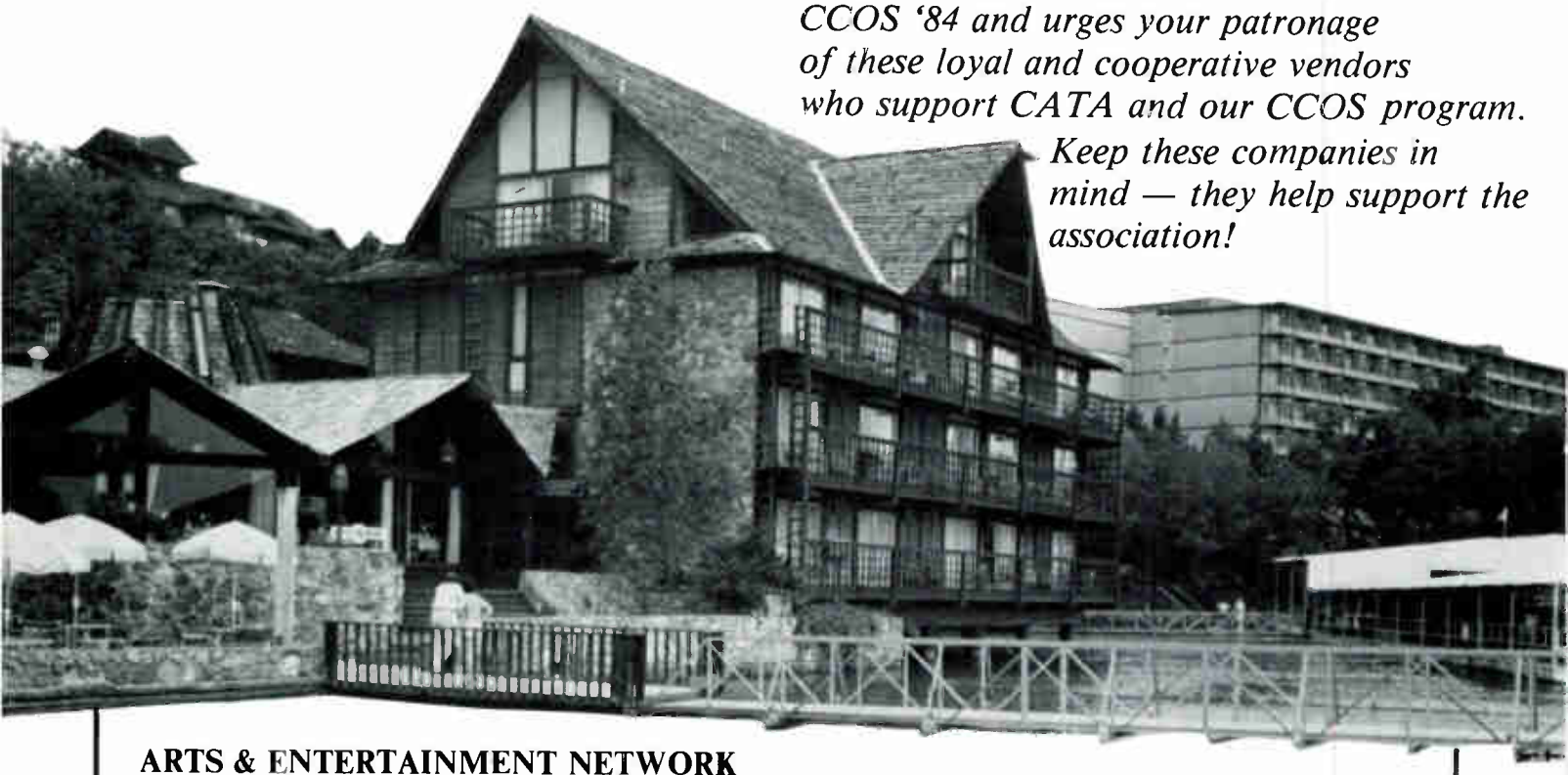
Mark Eldon, Director of Engineering with Showtime/The Movie Channel, made a technical presentation on two degree satellite spacing with graphs on carrier to interference ratios on existing older earth stations antennas versus the new ones. In particular, he was pointing out that there is need for a 23 dB carrier to interference ratio on the receiving antenna in order to get an overall 18 dB carrier to interference ratio, and that 18 dB c/i ratio seems to be the accepted minimum for earth stations product into a cable system. He pointed out that not just adjacent ratios give this interference, but uplink, downlink, and terrestrial must be included.

CCOS wouldn't be the same without Tony Bickel, Electron Consulting Associates, as a regular exhibitor, teacher, and technical advisor. He's helped make it work lots of times!

CCOS 84 IN TAN-TAR-A

by: Kathleen Sheldon

CATA salutes the Exhibitors at CCOS '84 and urges your patronage of these loyal and cooperative vendors who support CATA and our CCOS program. Keep these companies in mind — they help support the association!



ARTS & ENTERTAINMENT NETWORK
AVTEK, INC.
BETHLEHEM TOWER WORKS
BROADBAND ENGINEERING, INC.
C-COR ELECTRONICS, INC.
C-SPAN
CABLE GRAPHIC SCIENCES
CABLEFACTS
CATEL TELECOMMUNICATIONS
CBN CABLE NETWORK
CINDEX
COMSONICS, INC.
CWY ELECTRONICS
DATA MANAGEMENT CO.
THE DISNEY CHANNEL
DITCH WITCH
THE DROP SHOP
ECA/MANUFACTURING DIV.
E.H. DAVIS ASSOCIATES
EASTERN MICROWAVE, INC.
ESPN
GROUP W SATELLITE COMMUNICATIONS
HARMON & COMPANY
HOME BOX OFFICE SERVICES, INC.
HUGHES AIRCRAFT COMPANY
IND. CO. CABLE TV, INC.
K.E.S. (KLUNGNESS ELEC. SUPPLY)
KMP COMPUTER SERVICES
LARSON ELECTRONICS
LECTRO/CAPSCAN DIVISION
LIFETIME
LINDSAY AMERICA
M/A-COM CABLE HOME GROUP
MAGNAVOX CATV SYSTEMS
MICRODYNE CORPORATION
OAK COMMUNICATIONS INC
PANASONIC INDUSTRIAL CO.
PIONEER COMMUNICATIONS
QUALITY RF SERVICES, INC.
SACH COMMUNICATIONS INC.
SATELLITE SYNDICATED SYSTEMS, INC.
SHOWTIME/THE MOVIE CHANNEL, INC.
STANDARD COMMUNICATIONS CORP.
TAMAQUA CABLE PRODUCTS CORP.
TELSTAR MARKETING & CONSULTING
TEXSCAN CORP.
TONER CABLE EQUIPMENT, INC.
TRIPLE CROWN ELECTRONICS, INC.
TURNER BROADCASTING SYSTEM
UNITED VIDEO, INC.
USA NETWORK
WARNER AMEX SATELLITE ENTERTAINMENT COMPANY
WAVETEK INDIANA
ZENITH ELECTRONICS CORP.

Mike Aliosi, again participating from the Southeast Engineering Division for Showtime/The Movie Channel, identified primary sources of interference and covered various means of reducing and eliminating this interference, including various methods of shielding through different filtering product methods. As a follow-up to that, he presented a live demonstration on removing or filtering terrestrial interference at one of the demonstrations on the exhibit floor.

Craig Cuttner, Home Box Office, talked on the latest changes in HBO's plans to scramble their programming, the new, less expensive descrambler from MA/Com and the revised scrambling time table. The HBO affiliates should be receiving their descramblers in October or November. Testing will begin at that time, between programs, and then, hopefully, during the first quarter of 1985, HBO will be scrambling the entire product on the East Coast feed.

Shaun Johnson, Southern Satellite Systems, gave a most interesting talk about "probertunity" where problems create opportunities and opportunities result in problems; that there is unlimited opportunity and many excellent ideas and new concepts was brought out. Some succeed tremendously, some survive, and some fail . . . not because they aren't great ideas or concepts, or because of a bad opportunity, but because of marketing concepts, technological concepts, or timing. There's always some risk, but if we're going to be successful and grow, we have to take risks, he said.

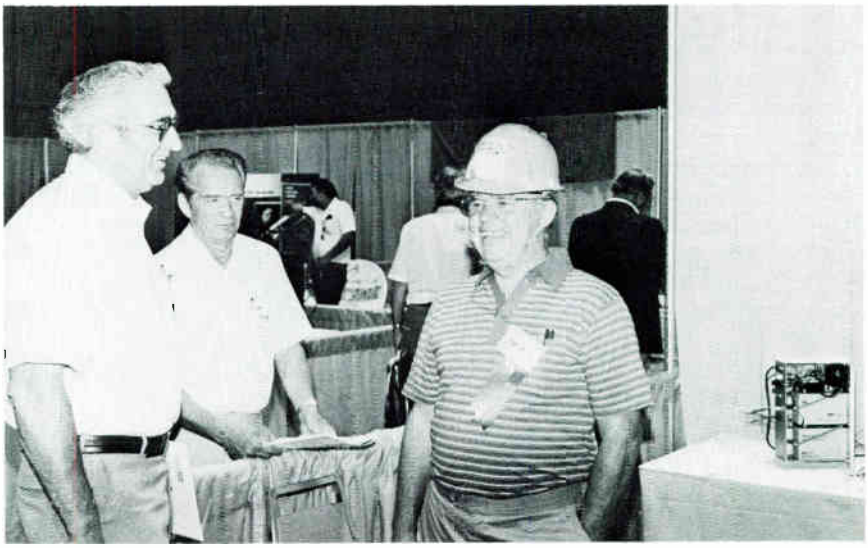
At a session titled **"Down the Up Escalotor"**, Dean Waite, a humorist, disguised as the Executive Director of CTAM, tossed a hard ball to Steve Effros, who had told him that was the game played at CATA sessions. He presented a pair of roller skates to Jim Ballard of ESPN in case he wanted to make a hasty retreat.

Panelists represented HBO, Showtime/The Movie Channel, Arts and Entertainment Network, Turner Broadcasting System, ESPN, Group W, and United Video.

The Drop Shop was again represented, and very well, by David Wang who first joined us at CCOS on the cruise. CCOS attendees are always happy for the opportunity to visit with David about Drop Shop services.

Newly elected CATA Director, Woody McHargue, visits with Standard Communications' Diane Hinte regarding their receiver and other equipment.

The SHOWTIME/The Movie Channel booth was full of monitors, demonstrating programming available through their service.



Ernie Larson always has something unusual to demonstrate — his headlight cap stopped everybody as they went by!

At CCOS, you can always bet there will be lots of cable tech talk!

All panelists whose companies are anticipating or have recently instituted rate increase defended their positions. They said they are looking to the operators for support and that these increases are a matter of survival. The TBS representative said that operators must come to realize that their networks are not ad supported, but "semi-ad supported". Penetrating, hard-hitting questions came from the audience and, while no positions were changed, the operators and the program suppliers had a good dialog going and considered each others views. Program suppliers expressed concern about the necessity for the current contract rates, and some said their companies were making a sincere effort to address the problems to everyone's benefit.

United Video said they do not anticipate any increases and that they have a discount structure. Dean Waite did an excellent job of moderating this discussion, which is a volatile subject on both sides.

Down to CATA Business

At the General Membership meeting Monday afternoon, President Peter Athanas announced that, by unanimous vote, the CATA Board of Directors had withdrawn its support of H.R. 4103. The Board stressed that its decision related solely to the legislation as currently written, and was precipitated by the massive change in the regulatory environment regarding cable television caused by the recently announced decision of the Supreme Court in Capital Cities Cable, Inc., VS. Crisp.

The Board further noted that it continues to support the long standing cable industry effort to have federal de-regulatory legislation enacted. CATA is urging all interested groups to become involved in that effort, as well, of course, as members of Congress, to continue the legislative drafting process. The present draft, however, was considered unacceptable, particularly with regard to rate and content regulation, and access by cable systems to potential subscribers. The Board also noted that there was a need to clarify Congressional intention in several sections of the bill, especially dealing with franchise renewal. Mr. Effros elaborated on this decision by responding to specific questions from the membership.

Clarence Dow, Secretary/Treasurer for CATA, in presenting the Treasurer's report, stated that the figures were incomplete at this time, but that the Budget Committee has gone over the figures and that the association is on firm financial footing.

It was announced that CCOS '85 would be held at Opryland Hotel in Nashville, Tennessee, and that CCOS '86 would be at the MGM Grand in Reno, Nevada.

Mr. Effros opened the meeting to questions from the membership. Several expressed concern about recent Board decisions that appear to effect CATA's focus; several expressed interest in becoming members of the Board of Directors.

Exhibit Floor Activities

There were some additions to this year's event, and one of these was the addition of the Consultant's Corner with demonstrations on the Exhibit Hall floor. Panelists from the Showcase Programs were scheduled to be available to talk to operators and discuss their problems on a one-to-one basis in the

Lindsay America Booth was manned by newcomers to CCOS — Ben Rhodes and June Clark.

The sessions were well attended, and obviously interesting of nature as evidenced by the attentive crowd.

Ind-Co's Gene Barnett and his wife visiting with a CCOS attendee.

consultant's area. The demonstrations featured important subjects, including terrestrial interference, signal leakage, and FCC compliance; this innovation attracted crowds of interested operators.

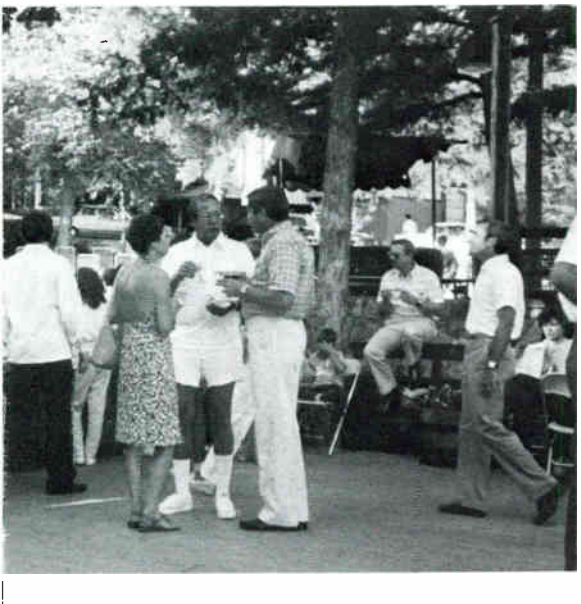
The CCOS '84 Show and Exhibit Management was handled by Baer Enterprises, Inc., led by Judith Baer and assisted by Ruth T. Williams. They supervised all details, and the idea of the exhibit floor demonstrations was initiated by Ruth who has more than thirty years experience in trade shows and conventions.

Activity on the Exhibit Floor was lively! Many old friends, and some new ones displayed their wares and talked over business. Ernie Larson of **Larson Electronics** showed a Rubber Magna Light, which has a far reaching beam for checking pole hardware at night, among other uses. Ernie pointed out that when it is pressed against a window glass, the beam reaches out, but does not reflect in the user's eyes.

Ditch Witch brought their equipment into the hall, and this included a drop plow 100 SX which is 24 inches wide and ideal for working in confined areas. The Ditch Witch 350 SX is a 35 HP class lawn plow, with optional equipment including a horizontal boring unit. Gene Gorely, representing Ditch Witch, said they usually sell sixty feet of boring pipe when this option is desired, although the standard bore is forty feet. He said the company will bring the equipment to a cable operator's job site for a demonstration, and those who wish to arrange such a demonstration should call him at (800) 654-6481.

Tony Bickel of **ECA/Manufacturing Division** had his VHF demodulator and Quad Pack on display. He said its new configuration allows higher density in equipment and freedom of processing not previously available economically to small system operators.

New faces in the **Klungness Electronics Supply** booth were John P. Jamarf and David Sanders; they were eager to discuss the services of



SHOWTIME/The Movie Channel's typical fun spot on the deck — good food and wonderful entertainment.

You can always rely on long-time CATA and CATJ supporter, Toner Cable Equipment Co., to work with the attendees on their equipment problems.

Cable Constructors, a Klungness company, which specializes in system upgrades, rebuilds, and engineering analysis. They said a rebuild usually costs from fifteen to twenty percent of the cost of a complete new build system, depending on the condition of the old system plant.

Telstar Marketing and Consulting is a new CATA Associate Member, exhibiting for the first time at CCOS '84 with Cubby Tracy, President, and Steve Tracy, Executive Vice President, there. This company offers a range of marketing and consulting services designed specifically for cable systems.

Lindsay America, Inc., represented by Ben Rhodes, General Manager, and June Clark, showed their 100 Series State-Of-The-Art Line passives to 500 MHz and Low Cost/High Performance 2-Way Amplifiers to 500 MHz. Mr. Rhodes discussed with us the CATV Head-End Survey that they provide with no obligation; if you have a reception problem and/or are planning a new CATV system, Lindsay can assist you with an improvement of your signal quality. Call them if this survey is of interest to you **(check CATJ's Associate Roster for telephone and address information).**

IND-CO's Harold Wilson and Gene Barnett were busy in their booth, visiting with their customers and meeting new prospects. These are two very helpful sales people, and you can always count on them to take the time to service their customers, and be helpful in making the proper selection of equipment, whether it's modulators, receivers, processors, splitters, etc.

We could go on and on about the impressive display of equipment on the Exhibit Floor, and CATA really appreciates their presence and support. Refer to the list of Exhibitors and see if the company that you are accustomed to dealing with was there; if not, remind them that CATA is an important group and that they should be represented at CCOS.

The Exhibit Floor was indeed lively, and the sales seemed to be going good. As in the past, the CATA members held off their purchasing until they got to CCOS so that they could visit with the company representatives and extend their support to the various suppliers as a gesture of appreciation for the support the Associates have given CATA during the years. If you did not make any purchases at CCOS or if you were unable to attend, please refer to the list of Exhibitors as you consider any acquisition of equipment, and let them know of your appreciation of their association with CATA.

Kathleen and Wayne Sheldon — Kay represented CATJ by preparing the wrap-up article on CCOS and is a consistent contributing author in her CATA personality services. Wayne is a long-time CATA member, Board Member, with several important committee assignments.

Jim Rushing, Hughes' Microwave Products Division, is a newcomer to CCOS and was exhibiting their new Microwave Line Extender.

Business was active at the Panasonic Booth showing their banking by television services.

Raleigh Stelle and Jim and Pam Hays "catching up" at the Anniversary Breakfast.

The AVTEK digital time domain reflectometer cable fault locator was popular equipment for the CCOS attendees to examine.

Hospitality

SHOWTIME/The Movie Channel had a very lively suite on Monday and Tuesday nights, with Kim Olson, the singer/guitarist who performs regularly at The Disneyland

Ed Allen, Western Communications and newly elected NCTA President, was the featured speaker at the CATA Tenth Anniversary Breakfast.

Obviously a very serious session on Dishes for Today and Tomorrow, with Ernie Larson serving as Moderator.

CATA's Director of Engineering, Ralph Haimowitz, visits the "goodie" table at the HBO hospitality suite.

The session on Security was well attended and included outstanding technical personnel on the panel.

to seeing them. **HOME BOX OFFICE** threw open their doors on Tuesday night providing good food, drink, and music for CCOS attendees. As is their usual custom, HBO entertained the young people of CCOS at an event on Wednesday morning while their parents attended the Anniversary Breakfast. CATA is most appreciative to these firms for their interest in providing the social climate for CCOS, and we look forward to seeing them on the program again.

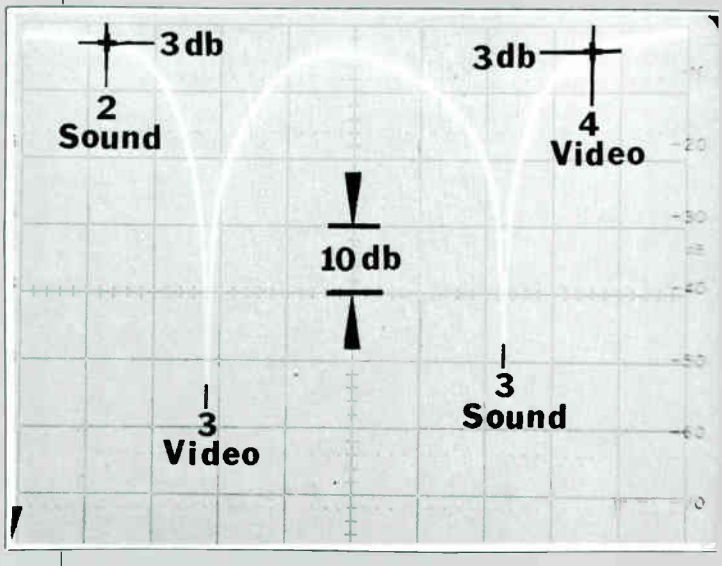
CCOS '84 Is Now History

As in the past, the site location for CCOS was the prime ingredient that lent itself to the proper setting and atmosphere for a successful meeting. Adding the meaningful sessions with the display of equipment in the Exhibit Hall, to the site blending in the cable operators and their families, and then spicing with the seasonings of friendship renewal and cable talk, created the product to add to the array of other memorable sites and CCOS meetings. But, as you must realize, these things just do not happen; hours and hours of work go into the preparation of these meetings, and we would like to list special thanks to the following:

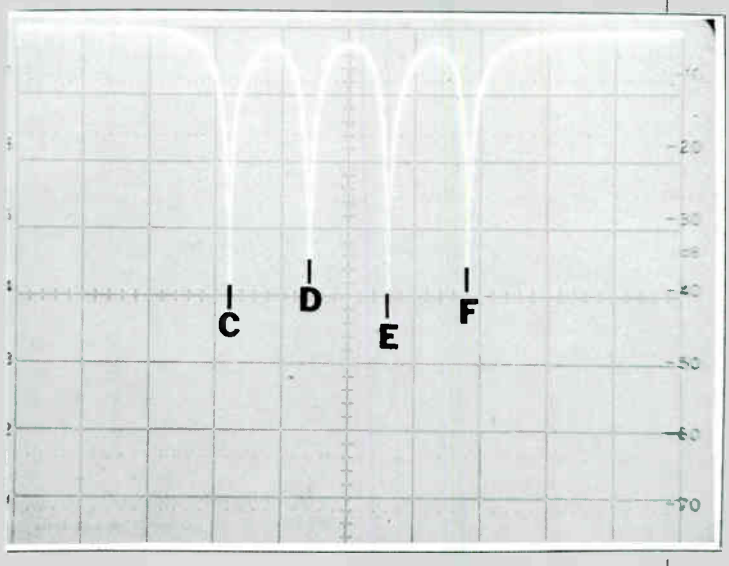
- The Washington Office - Steve Effros, Ellen Adams and Debbie Raabe
- Baer Enterprises, Inc. - Judith Baer and Ruth Williams
- Technical Assistance - Ralph Haimowitz and Kurt Bester
- The participating moderators and panelists
- The consultants in their corners

Plan now to attend CCOS '85 in the Opryland Hotel, Nashville, Tennessee; you may remember that we were there for a most delightful and worthwhile seminar in 1982, and, at that time, the management was asked by the CCOS attendees to reschedule there so that there would be another opportunity to take advantage of that historically interesting and attractive city. We did just that, so save your summer schedule to accommodate the dates of June 17-19, 1985 to join other cable operators and their families at CCOS '85!! □

Hotel, and Jason Randall, magician extraordinaire, entertaining the group; these two are regularly enjoyed in the Showtime/The Movie Channel hospitality suites over the country, and cable operators and their families always look forward



Video/Sound trap suitable for inclusion in PCS.



Response of a 4-Channel Pay-TV trap, suitable for inclusion in a PCS (B sound loss 6 dB).

(above I). Currently produced low cost hardware, permits consolidating **several** channel traps, or wide band notches (for several contiguous channels) into one case. Narrow notches have been avoided for outdoors use, because their temperature stability is somewhat less. However, they should be suitable for indoor PCS use.

Technique #3: The Active Trap

The active trap is not new. But now it is **cheaper** — and therefore feasible as a PCS device. Several decades ago there were instances when non-subscribers were denied service by injecting a carrier into the channel. More recently an "active trap" became the basis for TANNER's positive scrambling system **(see CATJ, July 1984)**. In this system a tone generator output is injected into the distribution system at the head end. Its frequency corresponds to mid-band of the pay channel. A decoder trap, to remove this tone, is installed at the subscriber's set. Because the trap and tone frequency must be exactly the same for the system to function properly, the frequency of the tone generator must be controlled to high precision. Because of this and other circuit features necessary to preserve good picture quality, such an "encoder" is relatively expensive. However, if used in a PCS, which turns the tone on/off, there is no requirement for precise frequency control nor many of the other circuit features. And the cost of the necessary transistorized circuit elements necessary have dropped dramatically over the decades. It is now possible to produce such tone generators on a 1-inch square circuit board for only few dollars, if produced in quantity. Further, such circuits can easily be made factory tunable over a large block of contiguous channels, reducing the variety which must be produced and, hence, lowering the cost even further.

They type "trap" removes both picture **and** sound without impact to adjacents, **even lower sound,** at **any** VHF-TV channel. Hence, it more nearly satisfies the ideal requirements listed previously.

Attention: Trap Manufacturers and Users

There's your general blueprint to an improved generation of PCS. Those of us who have a handle on these techniques should put them to work for the cable industry and cable operators should insist that we do.

Acknowledgements

Thanks, once again, to Carol Ryan (manuscript), Dave Skeval (photos) and Chris Bostick (sketch). □

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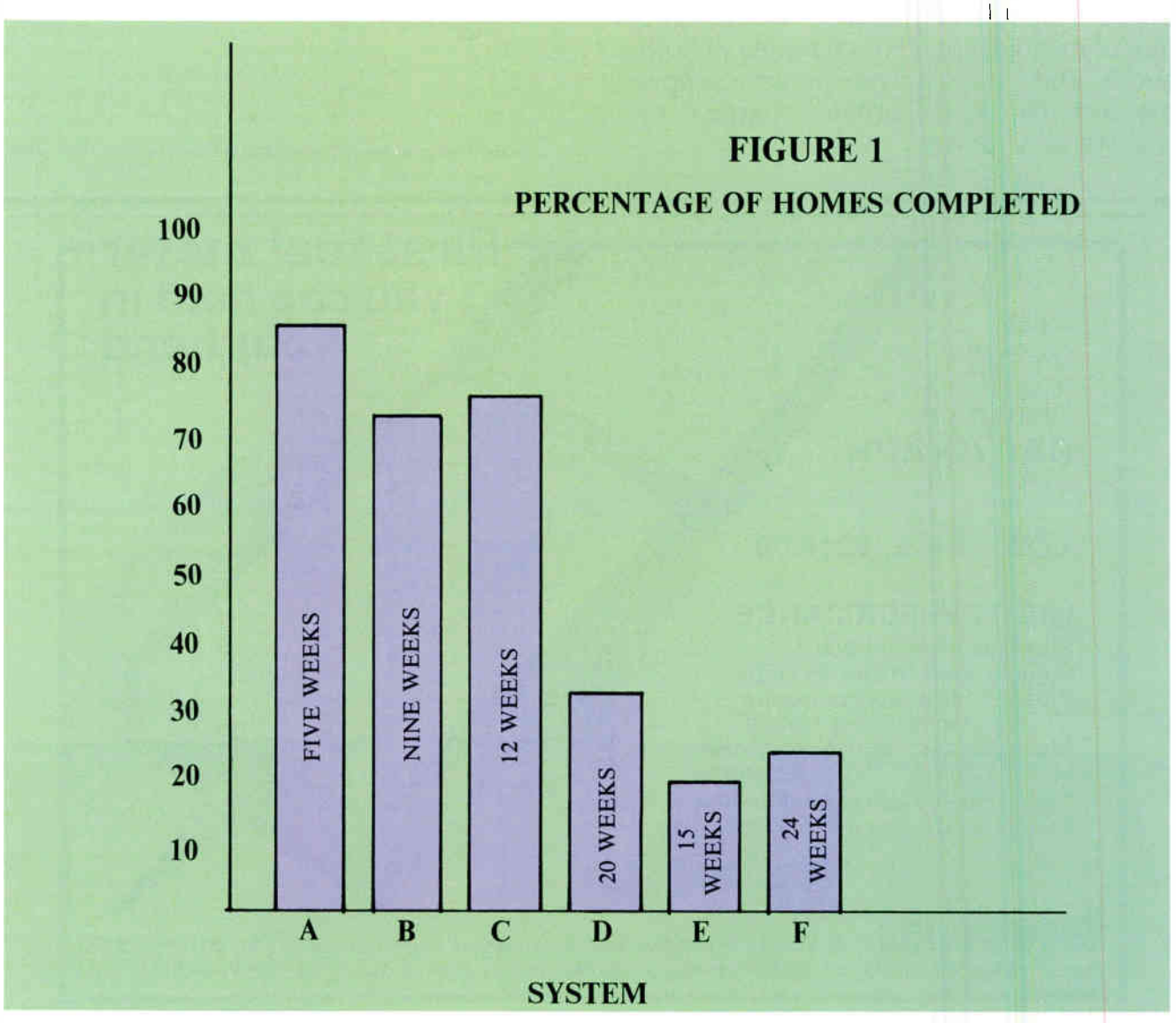
OPPORTUNITY KNOCKS

HEAD 'EM UP... ROLL 'EM OUT

by
Bob Cull
Cable Marketing Services

In these days of fast-moving technology, increased competitive pressures, increased costs and complex decisions, **"opportunity"** is a truly refreshing word. Those of us in cable marketing are continually looking for situations which can be described by that word. And, our search often leads us into places where others may view a certain event as a necessity, a technical change or an opportunity of a different kind. Such a diamond in the rough is the loved, hated, or tolerated converter rollout. It is all of these things because different people in the organization have conflicting opinions about both what it is and whether or not it is a valuable path to follow. But a true marketeer only is concerned with what it represents . . . the addition of new basic and pay services and "tightening up" the marketplace through increased security. Either way, it represents (here comes that word again) an opportunity to talk to new prospects about both old and new services, and to old customers about new services.

In order to present a complete picture about the opportunities



inherent in a converter rollout, we probably need to establish exactly what it is and then gain some understanding of the anatomy of the sales process. Then we can take a look at the rationale for mounting a sales campaign at the same time as the rollout, some methods of evaluation, a few cautions and an overall look at expected results.

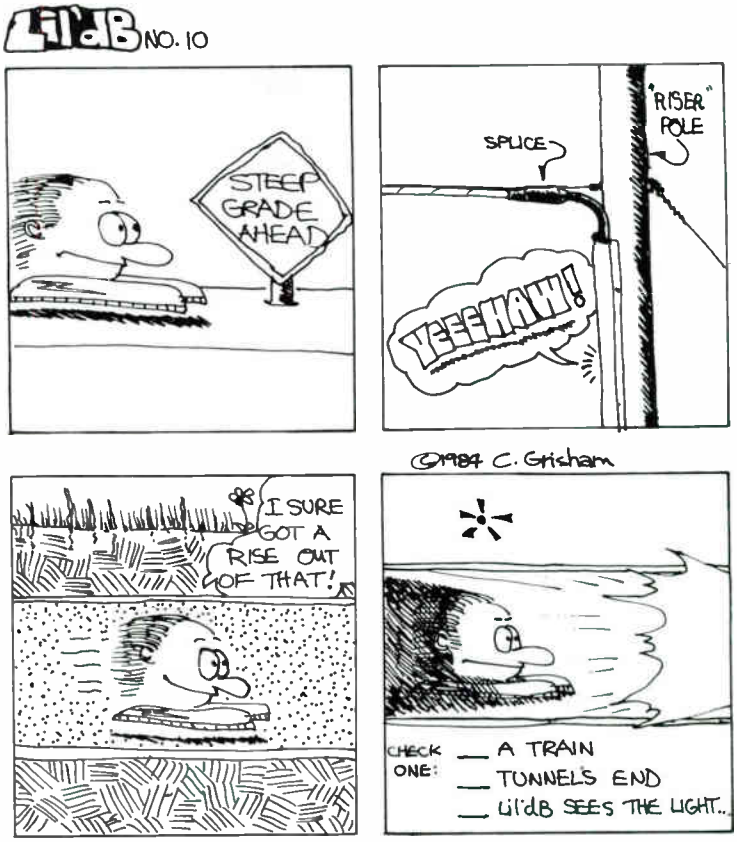
What "It" Is

For the purposes of our discussion here, a converter rollout would have some or all of the following characteristics:

1. Its primary feature is that of expanded services on both the basic and premium services.
2. Typically this expansion of services is accompanied by a price increase at basic and some adjustments on pay as well.
3. The consumer will be obligated for the higher basic price, regardless of whether or not they allow the new converter box to be installed in their home.
4. It provides a focal point for, and often generates, a complete restructuring of pricing concepts from a la carte to multi-level packaging.

Thus, you have a circumstance typically where the consumer will pay more, but will also receive more value. Additionally, it involves the physical act of installation in the customer's home. This step can be accomplished by the customer, your technical staff or by a sales person trained on converter installation.

If the converter installation can be accomplished by almost anyone, then the only question which remains is how to maximize the revenue result of this expensive decision to upgrade, rebuild and invest in new hardware. In our view, the way to do that is to look at the entire process as a sales and marketing function, not as a technical modification, or as a move to satisfy the city council. By putting on your sales and marketing face, so to speak, your

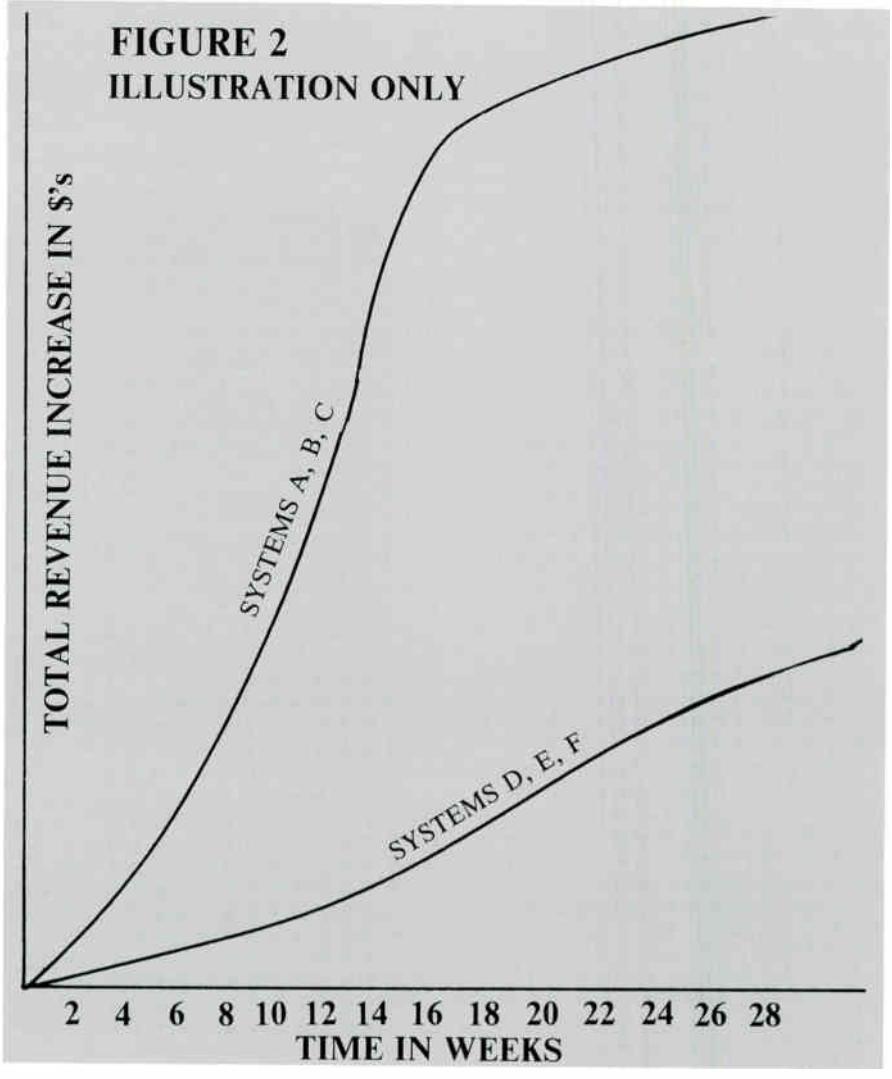


goal becomes one of increasing basic penetration, increasing the number of pay units and maximizing revenue, rather than the simple logistics of placing a certain number of boxes in a certain number of homes. There is a difference, and it can profoundly affect your future profitability. We are going to look at rationale later, but first let's break down the sales process and gain some insight into how that process works.

Anatomy of a Sale

There are a number of different steps involved with the sales process, and we won't bore you with breaking it down into an infinite variety of small movements. Rather, we want to focus on only a few points and then extend that discussion to the justification of using sales-trained people to execute the rollout. We will focus in a general way on four areas: (1) porch manners; (2) the message; (3) the materials; and, (4) the close.

One of the tools we use to evaluate the effectiveness of our sales people we refer to as a measure of their porch manners. It is simply the ratio between the number of contacts and the number of presentations made. This tells us what percentage of those people with whom you make contact are willing to allow you through the front door. In a regular sales campaign, this measure is critically important since the number of sales will certainly increase with the number of presentations. Thus, a rollout represents the maximum opportunity to gain entry since the converter installation must take place for the customer to receive value.



The second point has to do with the message we carry to the customer. If you view the rollout as more of a technical extension of the process, your message to the customer is likely to focus only on the need to install a new box in order that they be able to receive the expanded service. A sales-oriented message, on the other hand, would include at least the following:

1. Creating interest in the new basic services by summarizing the benefits.
2. Reinforcing overall value of basic package.
3. Introduction of new premium services.
4. Introduction of new pricing and packaging.
5. Encouraging purchase of additional cable services as a means of enhancing enjoyment and maximizing value.

Without belaboring the point, you can see that the message is entirely different and, we can assure you, will have an entirely different result.

The third component we want to highlight is the materials we use, whether in the office, a converter store, or on the front porch. As with the verbal message discussed previously, the printed materials can vary a great deal depending on your point of view. A technical message will be limited to Steps A, B, and C of the converter install process. A sales approach will also include this information, but it will highlight features, benefits, and overall value of the change. One provides instruction, the other also creates excitement and interest.

The fourth critical aspect is the close. Put simply, in a technically-oriented rollout, there is none. Using a sales approach, everything you say and do is aimed at that end result.

By covering these four points, we hope to have provided a good understanding of how your perception of the process affects both its content and its results. But, beyond the drive for increased revenues and profits, there are other good reasons why a sales-trained team should be used for your rollout.

Additional Rationale

There are at least a couple of good additional reasons why a sales-trained team makes sense. One has to do with the opportunity to create a **"happening"** and the other has to do with the complexity of the message.

As we have pointed out in previous articles, there are only a few times in the life of a franchise which offer the opportunity to create excitement and interest. Next to a new build launch, a comprehensive expansion of services may be both the most critical and the most potentially rewarding time of all. To approach this event with any less than a fully-loaded sales program may mean that you fail to seize the second most important marketing opportunity available.

The second point has to do with the complexity of the message which must be conveyed. Done properly, the message would be multi-faceted and would include reinforcement, explanation, persuasion and closure. Depending on the number of new services and the amount and type of price restructuring, the message can become complex. We have found that, as the message becomes more complicated, the need to approach the customer on a one-to-one basis becomes more important. In a one-to-one situation, it is much more likely that the customer will gain complete understanding, resolve questions and concerns, and respond favorably to the new opportunities to buy.

Much of what we have said deals with a sales-trained team going into the community to achieve both sales and installation objectives. However, the face-to-face opportunity can also be available through other means such as a converter store. While we have used this tool, and recommend it in certain cases, there are some drawbacks as it relates to the sales situation. One is that the environment is not typically conducive to an unhurried presentation without distraction. Further, the family decision-makers often select any additional services, or elect to stand pat, in the absence of a sales presentation. Then they simply send one family representative to handle the paperwork and pick up the box. For these reasons the opportunity to add incremental sales may be somewhat limited. However, there have been highly successful converter store programs and, if handled properly, these shortcomings can be minimized. Too, direct sales activities can always be supplemented by other tools, but all should be used in the context and within the limits of the points which have already been made.

Some Criteria for Evaluation

As we try to point out the importance of capitalizing on a rollout from a sales standpoint, and are also suggesting that direct sales may offer the best solution, it becomes important to offer some statistical support for this rationale. The non-statistical foundation has been laid, but it

would be helpful to look at some comparative numbers and guidelines for evaluating cost. Bear in mind that there are a wide variety of experiences and circumstances, each of which could affect the outcome. In our experience, however, the systems shown in **Figure 1** represent the general results obtained using different approaches.

In **Figure 1**, the **"Percentage of Homes Completed"** represent those homes in which some action has been taken (a converter install, a sale, or both). Systems A, B and C were, with the exception of some market-softening activities, characterized by a sales-trained team. The others were initiated and pursued using other means of indirect promotion. In all cases there were a lot of new services and a complex new group of packages and prices.

The net result of all this, of course, affects the rate at which the system is able to achieve higher levels of revenue. The more intense, face-to-face promotion seems to yield these results faster than other methods, as the illustration would indicate in **Figure 2.**

In addition to evaluating approaches based on projected revenues and time for task completion, you obviously need to look at cost. As with most anything else, the method which will yield the greatest return in the shortest time is typically going to be more expensive on both a cost per unit and cost per sale basis. However, as **Figure 2** suggests, you should also look at the effect of adding revenues more quickly. The bottom line effect may be that the accelerated approach bcomes more cost efficient when all things are considered.

Other important considerations might come into play if, for example, you were installing addressability. The sooner the boxes are in place, the better, as it relates to security and new sources of revenue through pay-per-view. Other items could be added to your list as they relate to specific local needs, limitations and opportunities, rounding out your evaluation with as many meaningful factors as possible.

Summary

Before we exit, it is important that you understand that a complete converter rollout is unlike anything you have experienced. While there are some similarities between it and the new build days, there is just nothing quite like waking up in a brand new, noisy world after years of relative quiet. Plans, inventory systems, tracking mechanisms, and new procedures must be put in place, along with preparing the staff for the turmoil which is to follow. And we have found that, no matter how much time we spend in employee training and preparation, they still want to run for the door when it happens.

But, all in all, it is a competitive necessity, improves the value of cable service to our communities, and allows us to grow within the confines of a fixed universe. It's not an easy deal, but it can be a good deal. □

LNAs FOR MULTICHANNEL MICRO

BIOGRAPHICAL INFORMATION DR. TOM STRAUS

Dr. Tom Straus received his Ph.D. and M.A. in Applied Physics from Harvard University and his B.S. in Physics from the University of Michigan. He has been with Hughes Aircraft Company for the past 25 years working in various areas including satellite communications, laser communications, and microwave component development. In 1970 he became involved with the development of the AML local distribution service microwave equipment utilized by the CATV industry and in 1974, in recognition of this development, received the NCTA award for outstanding technical achievement. Most recently Dr. Straus has assumed the position of Chief Scientist of the Hughes Microwave Communications Product Line in which position he oversees the development of advanced equipments.

BIOGRAPHICAL INFORMATION IRVING RABOWSKY

EDUCATION

B.S. and M.S. degrees in Electrical Engineering from Illinois Institute of Technology.

WORK EXPERIENCE

On the Technical Staff of J.P. Seeburg, Motorola, and Cascade Research Corporation.

President, Valley Microwave, microwave components manufacturer.

Chief Engineer of Theta Com, where he designed the STX-141 and STX-151 microwave radio products.

Division Chief at Los Angeles County Communications Department in charge of county operation of microwaves and data networks.

Since 1980, with Hughes Microwave Communications Products, responsible for the development of new data and voice microwave communications systems.

WAVE RECEIVERS

By: T.M. Straus and I. Rabowsky
Hughes Aircraft Company, Microwave Communications Products
Torrance, California

ABSTRACT

The fade margin of any microwave path can be extended by reducing the noise figure of the receiver. Low noise Ku Band gallium arsenide FET amplifiers and image reject filters have been developed specifically for multichannel microwave receiver application in the 12.7 - 13.2 GHz band. Incorporation of the amplifier into such receivers either as a retrofit or in new designs generally requires built-in AGC circuitry to control the signal level and optimize performance. Without AGC ahead of the LNA, the third order distortions can build up to unacceptably large levels during unfaded conditions. Performance tradeoffs of various typical system configurations are examined. These tradeoffs illustrate the regimes in which AGC utilization is required.

INTRODUCTION

Steady improvements in GaAs FET technology has led to the development of amplifiers with noise figure on the order of 3 dB in the 12.7 - 13.2 GHz band. This type of LNA, if properly employed, can be incorporated into a multichannel microwave receiver with substantial system benefits. On newly installed paths, the improved receiver noise figure can be traded off against increased antenna diameter. Alternatively, longer path distances are feasible with acceptable system performance. For existing paths, the retrofit of a low noise amplifier and image noise rejection filter into a receiver will lead to increased path margin to overcome rain and multi-path fades. However, the retrofit usually must utilize an AGC to avoid the generation of excessive composite triple beat and other distortions.

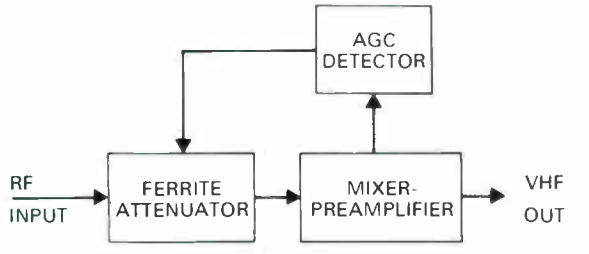


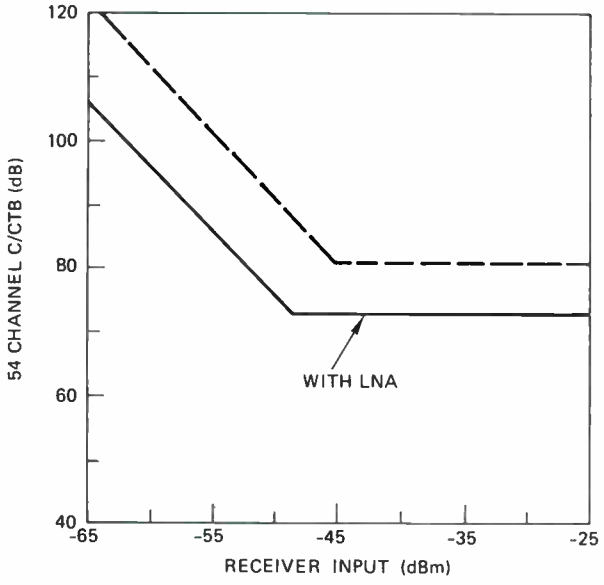
Fig. 1. Multichannel AML receiver simplified block diagram.

LNA WITHIN RECEIVER

As a point of comparison consider first a standard multichannel CARS band receiver operating without an LNA. The receiver is designed to maintain a constant signal level not only at its output, but also at the input to all circuits within the receiver capable of generating any third order distortion. Figure 1 is a simplified block diagram of such a receiver. Its noise figure is specified to be less than 10 dB. The AGC can maintain the VHF output constant over a 35 dB range of microwave input. Throughout this region, both S/N and third order distortion are constant. One can be traded off against the other by adjustment of the AGC level. For instance, the 54 channel carrier to composite triple beat ratio is 81 dB for a S/N of 53 dB. At 56 dB S/N composite triple beat degrades 6 dB to 75 dB. Alternatively, at 50 dB S/N the composite triple beat is 87 dB. In any practical path, the maximum signal available at the input of the receiver is limited by fixed path losses. The difference between this maximum signal and the signal at which the output signal starts to fall is the available AGC range. If rain or multipath attenuation exceeds this range S/N at the output of the microwave receiver will be degraded.

This drop in S/N at low input levels is illustrated in Figure 2. The figure also shows the extension of the AGC range to 3.5 dB lower input level by utilization of an LNA between the ferrite attenuator and the mixer as shown in Figure 3. The 3.5 dB improvement in available AGC range also shows itself as a 3.5 dB improvement in fade margin to an "outage level" S/N of 35 dB. The typical 3.5 dB improvements should not be confused with the 3.5 dB noise figure specification of the single stage LNA. The receiver fade margin improvement, ΔF, is a function of both LNA noise figure and gain, G, as well as the receiver noise figure before installation of the LNA. The higher the LNA gain, the greater, up to a point, the improvement in fade margin. However, in order to maintain the S/N within the AGC range at 53 dB, the AGC operating point must be raised by (G - ΔF) dB. This establishes the correct input level at the LNA. Note however the mixer-preamp is driven harder than before. As a result the $^{C}/_{CTB}$ is degraded by just 2 X (G - ΔF) dB. For single stage LNAs the gain, less filter loss, is typically 7.5 dB.

A dual stage LNA with 15 dB of gain would further increase ΔF by 1-1/2 dB to 5 dB. At a S/N of 53 dB the



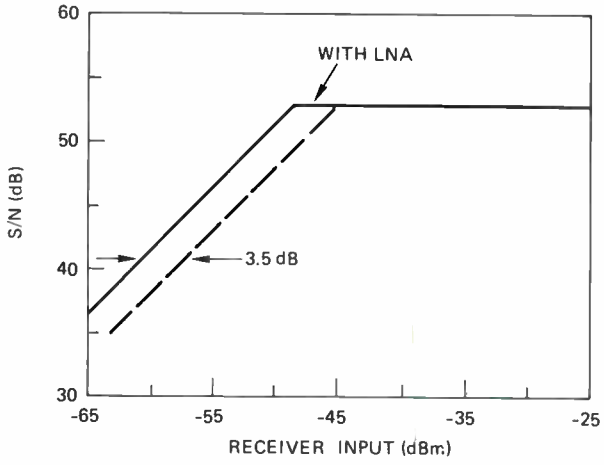


Fig. 2. Receiver S/N and C/CTB with and without built-in LNA.

54-channel C/CTB would then by on the order of 61 dB, a value too low for most cable system applications. This is the reason why the LNA gain must be restricted in this configuration. On the other hand for 21 channel applications the C/CTB would be approximately 72 dB and the built-in dual stage LNA would therefore become a viable candidate.

Note that in all of the above cases the LNA contributes negligibly to the composite triple beat. This is due to its high 3 IM intercept point, +21 dBm in the case of the single stage LNA and +24 dBm for the dual stage LNA. This high intercept point is achieved by means of a balanced design. It should also be pointed out that full advantage of the LNA low-noise performance can only be obtained by providing an image noise reject filter as shown. This is particularly true with high LNA gain since the LNA is then by far the dominant source of noise at the output of the receiver. Since the LNA is a broadband device typically having full gain at the image frequencies, deletion of the filter would degrade the receiver sensitivity by as much as 3 dB.

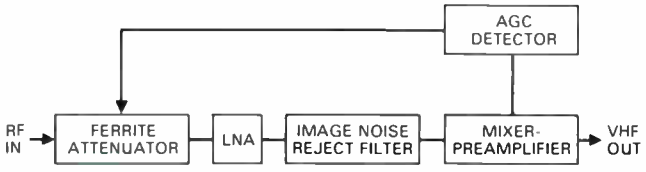


Fig. 3. AML receiver with integrated LNA.

Fig. 4. External LNA arrangement.

EXTERNAL LNA CONFIGURATIONS

In contrast to the arrangement shown in Figure 3, CATV systems have often installed an LNA preceding the broadband microwave receiver, either with or without an image reject filter. The generalized arrangements is shown in Figure 4. The deleterious consequence of working without a filter has already been discussed so it will be assumed that the filter has been installed to obtain the largest possible fade margin improvement. Any waveguide loss between the LNA and the receiver is represented by the loss, L, in Figure 4. This arrangement permits mounting of the LNA directly behind the antenna while the bulkier receiver can be more readily serviced at ground level. If then one were to compare the fade margin performance of such a ground-mounted receiver with and without the antenna-mounted LNA, the improvement would be very dramatic particularly if the waveguide loss is substantial. This is illustrated by Figure 5 which assumes the existance of 5 dB of waveguide loss. The improvement in fade margin is 9.4 dB. Naturally, this improvement would be less if L were smaller, but a part of the improved fade margin is also due to the fact that the LNA now preceeds the ferrite attenuator and its unavoidable minimum insertion loss. Thus, the configuration yields the largest fade-margin improvement. The receiver AGC threshold is again set for 53 dB S/N at an antenna input of −40 dBm (corresponding to −45 dBm at the receiver input in the absence of the LNA) but the S/N is not constant in the AGC range. As the signal level increases, S/N at first improves dB for dB until the receiver AGC sets in. In this example, the AGC is set only 1/2 dB higher than usual with respect to the mixer-preamp input level. With this setting, the S/N rises to 53

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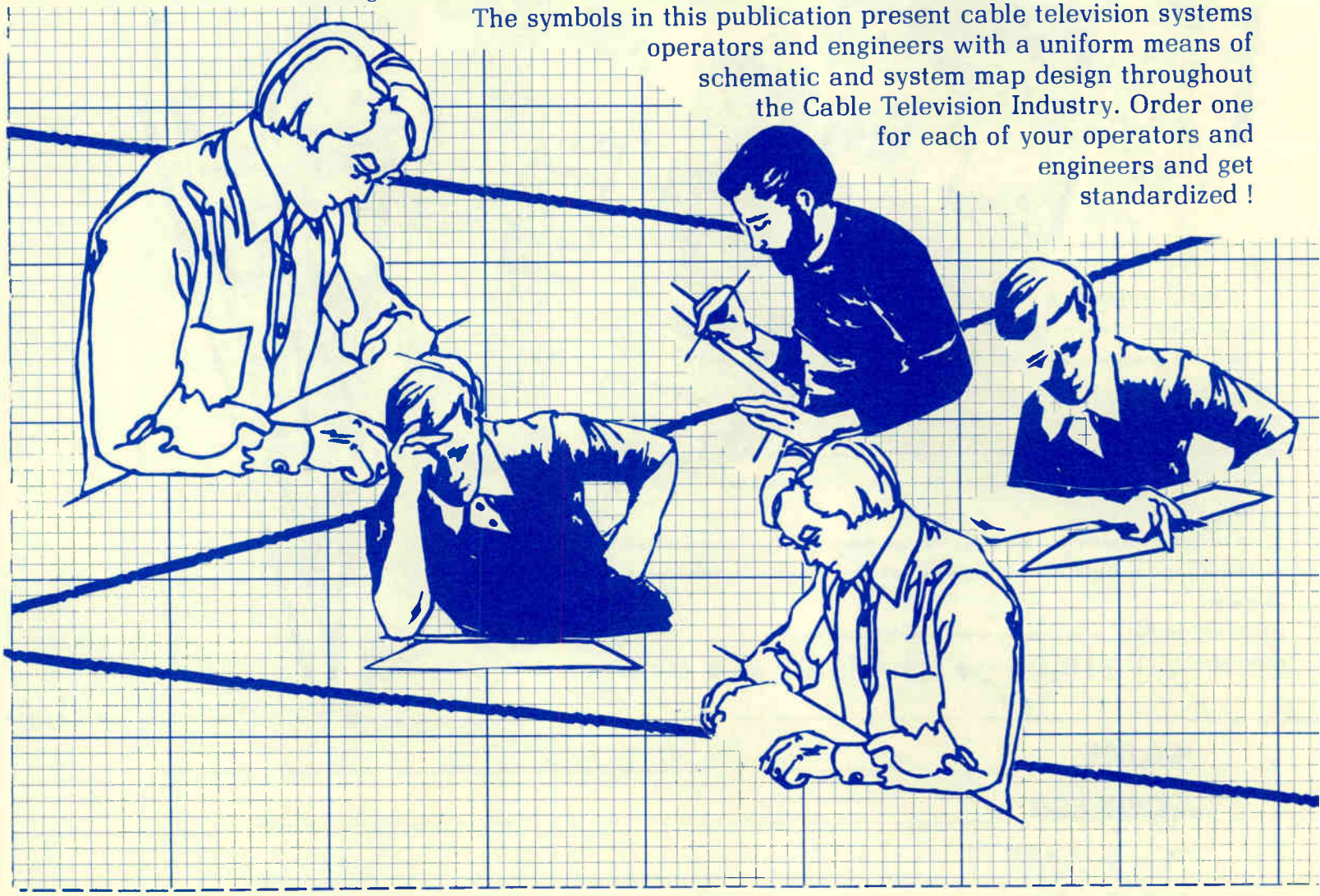

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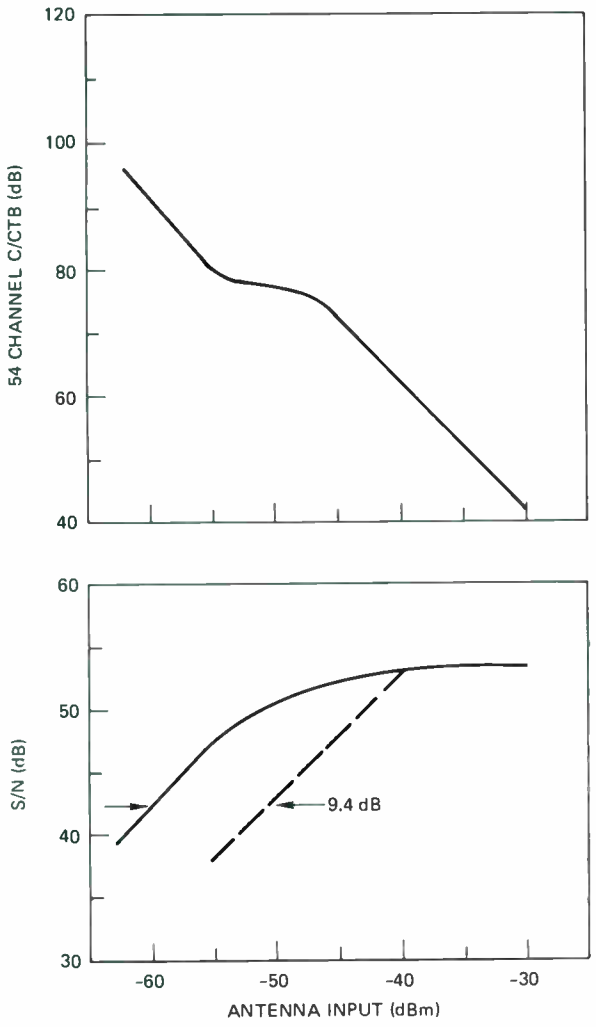
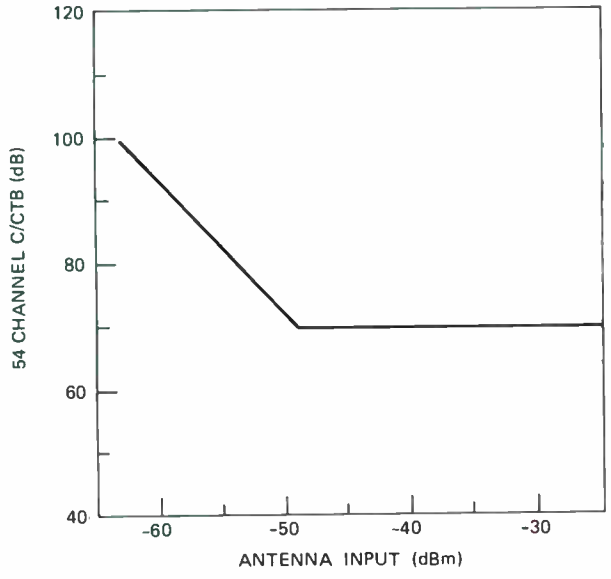


Fig. 5. Tower mount dual stage LNA (5 dB waveguide loss).



dB at −40 dBm antenna input. The gradual rise in S/N is due to the fact that while the signal is kept constant after the −53.8 dBm antenna input threshold, the LNA's contribution to noise is increasingly attenuated by the ferrite attenuator. Ultimately preamp noise predominates and the S/N flattens out at high signal level.

Third order distortion at low signal levels is primarily due to the mixer preamp. However, at −49 dBm antenna input the contribution from the LNA equals that of the mixer preamp whose distortion remains constant above the AGC threshold. As the antenna signal continues to increase the LNA's contribution to 3rd order distortion dominates. The actual number depends on both the LNA gain and 3 IM intercept point. The lower the gain and higher the intercept, the better the C/CTB at the high signal levels. Nevertheless, despite the high +24 dBm intercept specification for the 2-stage LNA, it is evident that 3rd order distortion is unacceptably high for LNA input levels in excess of −40 dBm. Even 62 dB C/CTB would hardly be "transparent" when added to the cable system were it not for the fact that LNA caused intermodulation is likely to add on a power basis rather than a voltage basis to that of the cable system. In phase voltage addition is probable only when like devices are generating the distortion products. Power addition of composite triple beat generated by a microwave FET amplifier and a VHF hybrid amplifier has been verified in the laboratory.

EXTERNAL AGC

To extend the useful range of application for the tower-mounted LNA it is necessary to place the AGC function in front of the LNA as in the previous configuration. This is conceptually achievable by removing the ferrite attenuator from the AML receiver and mounting it instead in front of the LNA. Figure 6 shows the performance obtained. The fade margin improvement is 0.7 dB less for the same LNA and waveguide as in Figure 6 because the small signal insertion loss of the ferrite attenuator is now in front of the LNA instead of

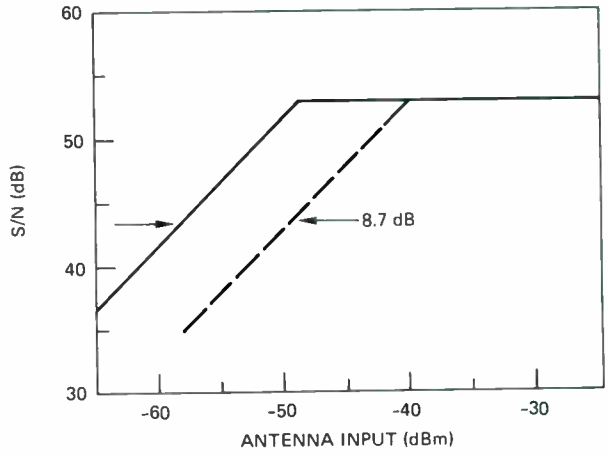


Fig. 6. Tower mount LNA with AGC (5 dB waveguide loss).

following it. The 8.7 dB fade margin improvement dictates that the AGC commence at −48.7 dBm at the antenna input. This translates to 5.6 dB higher than normal signal level at the mixer preamp input to achieve the 53 dB S/N. As in Figure 2, C/CTB is dominated by the mixer-preamp.

Even better performance could be obtained with a dual AGC control. In this case the ferrite attenuator remains inside the AML receiver but an additional ferrite attenuator is added in front of the LNA. At very low signal levels neither AGC is activated. At threshold, the attenuator internal to the receiver becomes active and maintains constant input level to the mixer-preamp. As the antenna signal level continues to increase, this attenuator takes on a fixed value and control shifts to the pole-mounted attenuator. Thereafter, a constant signal level is maintained throughout the remaining AGC range at the LNA as well as at the mixer. Despite ahd added complexity that this concept embodies, improvement in C/CTB is a modest 3.5 dB relative to the case illustrated in Figure 6. A more fruitful approach to further improving intermodulation would seem to be a direct improvement of the linearity of the mixer-preamp. In any case the performance indicated by Figure 6 should be satisfactory for most cable systems.

SUMMARY

In conclusion, LNAs can be used to increase fade margin on a microwave path. However, care must be taken to avoid excessive generation of third-order distortion products. This is best done with AGC which maintains both S/N and C/CTB constant as with standard multichannel broadband receivers. If LNAs are used without AGC the range of permissable applications is severly limited. In any case it is important to specify a high LNA 3-IM intercept point and to utilize an image-noise reject filter to achieve the best possible performance. □

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1-800—682-7140 (Mich)
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Denton, TX 76201
817—387-0002
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Lifetime
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Americas
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(SZ9, Programming)

Lindsay America Inc.
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904—769-2321

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East Syracuse, NY 13057
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(M9)

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

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305—747-4998
1-800—327-9767
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RMS Electronics,
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Bronx, NY 10462
1-800—223-8312
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Englewood, NJ 07631
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(S4)

Satellite Syndicated Systems, Inc.
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Tulsa, OK 74147
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(S9)

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214—438-7691
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1-800—523-5947
In PA. 1-800—492-2512
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404—898-8500

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1-800—331-4806
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212—944-4250
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1-800—428-4424
TWIX 810—341-3226
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Weatherscan,
Loop 132,
Throckmorton Hwy.,
Olney, TX 76374
817—564-5688
(D9, Sony Equip. Dist., M9 Weather Channel Displays)

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(M2, 9 Towers)

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1000 N. Milwaukee Ave.
Glenview, IL 60025
312—391-8195
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Showcase

C-COR SHIPPING QUANTITIES OF FEEDFORWARD AMPLIFIERS

C-COR Electronics, Inc. has announced that significant quantities of its feedforward trunk amplifiers have been shipped and installed and that order input continues to be healthy. Acceptance of C-COR's Triple S, Sealed Signal Synchronizer, ceramic delay line (patent pending) feedforward amplifiers has required the company to increase production schedules to now manufacture one feedforward amplifier for every two conventional amplifiers.

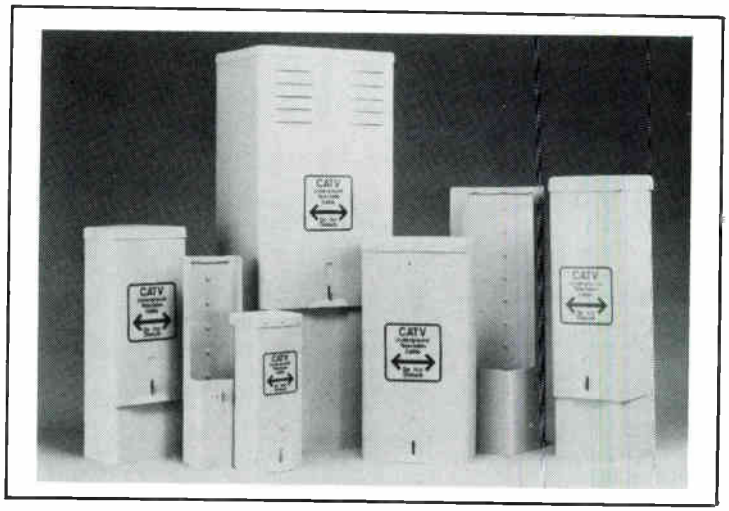
Statements made by users of C-COR feedforward products include:
John Mulhearn, Director of Engineering, CBS Black Hawk Cable — "We are installing C-COR's standard and split-band feedforward trunk amplifiers in our systems and have been very pleased with their performance and simplicity of design and operation. We anticipate using more feedforward equipment as we upgrade our systems. We have used a variety of C-COR equipment since the late '70s and have always been able to depend on its high level of reliability. We feel confident that we will receive the same degree of reliability from C-COR's feedforward products."

Charlie Martin, Regional Engineer, American Television and Communications Corp. (ATC) — "Before purchasing equipment, we carefully analyzed the performance data on C-COR's feedforward amplifiers and were very impressed with the numbers. We now have a number of the amplifiers installed and are extremely satisfied with the ease of operation and high performance levels." N.F. (Nick) Hamilton-Piercy, Vice President-Engineering and Technical Services, Cablesystems Engineering, Rogers Cablesystems Inc. — "We were very particular in our evaluation of equipment for the Toronto and Vancouver systems. We chose C-COR's feedforward products for simplicity of design and operation, reliability and the company's ability to meet our tight delivery schedules."

C-COR first introduced its ceramic delay line feedforward trunk stations and extender amplifiers in November, 1983. The feedforward products, with three patents pending, represent a technological breakthrough featuring simplicity of design, unique ceramic delay lines, only six adjustment points and a solution to the problems of stability at temperature extremes. Applicable in both new construction and rebuild situations, feedforward products permit a reduction in the number of amplifiers required while providing higher performance. Older systems can rebuild with the increased bandwidth, drop-in feedforward amplifiers without incurring the costs of relocating amplifiers. Larger systems can often estimate costly antenna/hub sites since feedforward amplifiers extend the reach of the cable system.

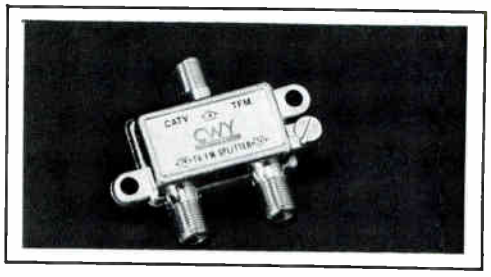
For more information, contact C-COR at (814) 238-2461 or 60 Decibel Road, State College, Pa. 16801. •

CWY OFFERS EXCLUSIVELY PRODUCED PEDESTALS



Pedestals designed exclusively for the cable television industry are now available from CWY Electronics, Lafayette, Indiana. The pedestals feature 16- or 18-gauge T2 aluminized steel construction, shown to outlast unpainted galvanized steel at least five-to-one. Rectangular in design for maximum use of interior space, the CWY pedestals can also be flush-mounted directly to buildings. Pedestals also feature positive, secure hingeless cover removal system in which the top removes with the front cover for full exposure of pedestal interior. Hipped-lid and interior-lid guides provide additional security. Other features include fully replaceable 11-gauge hasps, multiple equipment knockouts to suit specific installation requirements, heavy duty grey/green #2854 polyester baked enamel finish, and 14-gauge galvanized steel security stakes. •

NEW FM TAP BY CWY



Addressability of all control frequencies to the set top converter is now possible with the new FM tap introduced by **CWY Electronics.** The Model TFM TV/FM splitter allows the TV tap port to be addressed with control signals throughout the RF spectrum while providing a pass band filtered output to the FM tap port. The new splitter provides frequency response of 5-5000 MHz for TV and 84-130 MHz for FM. Other specifications include maximum insertion loss of 1.5 dB for 5-300 MHz TV, 2.5 dB for 300-500 MHz TV and 10 dB (+/– 1.5 dB) for 84-130 MHz FM; rejection of 30 dB minimum; and isolation of 35 dB minimum.

For more information on the new Model TFM splitter, contact: **CWY Electronics,** P.O. Box 4519, Lafayette, IN 47903, or call toll-free: 800-428-7596. In Indiana; 800-382-7526. •

NEW MOTORIZED POLAR MOUNT ALLOWS CABLE OPERATORS TO SWITCH SATELLITES AT THE TOUCH OF A BUTTON

Microdyne's new motorized polar mount and programmable controller make it easy for cable television operators and broadcasters to switch between satellites along the geosynchronous arc.

With new programming being offered on an ever-increasing number of satellites for cable and pay-per-view television, the motorized polar mount provides a fast, efficient method of switching from one satellite to another in order to expand programming options.

The polar mount is designed primarily as an option for Microdyne's 5- and 7-meter parabolic antennas and joins their current line of motorized polar mounts for 10' and 12' antennas. The rack-mounted programmable position controller for the polar mount is simple to operate and has storage capacity for up to 16 satellite positions, including presetable polarization.

For more information on Microdyne's new motorized polar mount, call (904) 687-4633 or write to Marketing Department, Microdyne Corporation, P.O. Box 7213, Ocala, Florida 32672.

BLONDER-TONGUE INTRODUCES GUARDSMAN OFF-PREMISE CABLE PAY TV SYSTEM

Blonder-Tongue Laboratories, Inc., Old Bridge, NJ, has introduced its new Pay TV System, an economical method of adding up to six premium (pay) channels to any CATV system. The Guardsman utilizes off-premise scramblers to securely deny the premium services to non-subscribers and non-paying customers. The system can be configured as an addressable, non-addressable or hybrid addressable/non-addressable system.

An address encoder located at the headend provides channel and/or tier authorization to the individual scramblers throughout the CATV system. The encoder also interfaces with the Central Billing Station to provide essential commands, message validations and data.

The Guardsman subscriber module provides secure video scrambling on up to 5 channels and video-plus-audio scrambling (for adult programs) on one channel. The module can be strand, pole or pedestal mounted and has a plug-in AC transformer and power/RF diplexer which is placed in the subscriber's home. Separate Guardsman drops are not required for multiple TV sets in a home or apartment. One drop serves all TV sets.

Since subscriber units are inserted into individual drops, the CATV system needs no plant modifications. Authorization address information is sent in-band so a system does not need 2-way capability and headend modification is minimal.

The address and billing computer software is user friendly and no computer experience or extensive training is needed for operation.

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

Classified

OPPORTUNITIES

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Chief Technician for West Texas. Head end maintenance and plant trouble shooting of Jerrold Starline 20. Send resume or call 1-915-523-5280. Mustang Cable TV, 107 West Broadway, Andrews, Texas. 79714.

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