

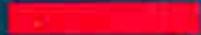
OCTOBER 1987

COMMUNICATIONS ENGINEERING AND DESIGN
THE MAGAZINE OF BROADBAND TECHNOLOGY

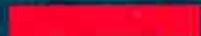
CEED

*****3-DIGIT 565
28361 991231 CEDF 1492 3D
FRED MCCORMACK
HALSTAD ENGINEERING
HALSTAD MN 56548

**Fiber in CATV:
A ripple or a
wave?**

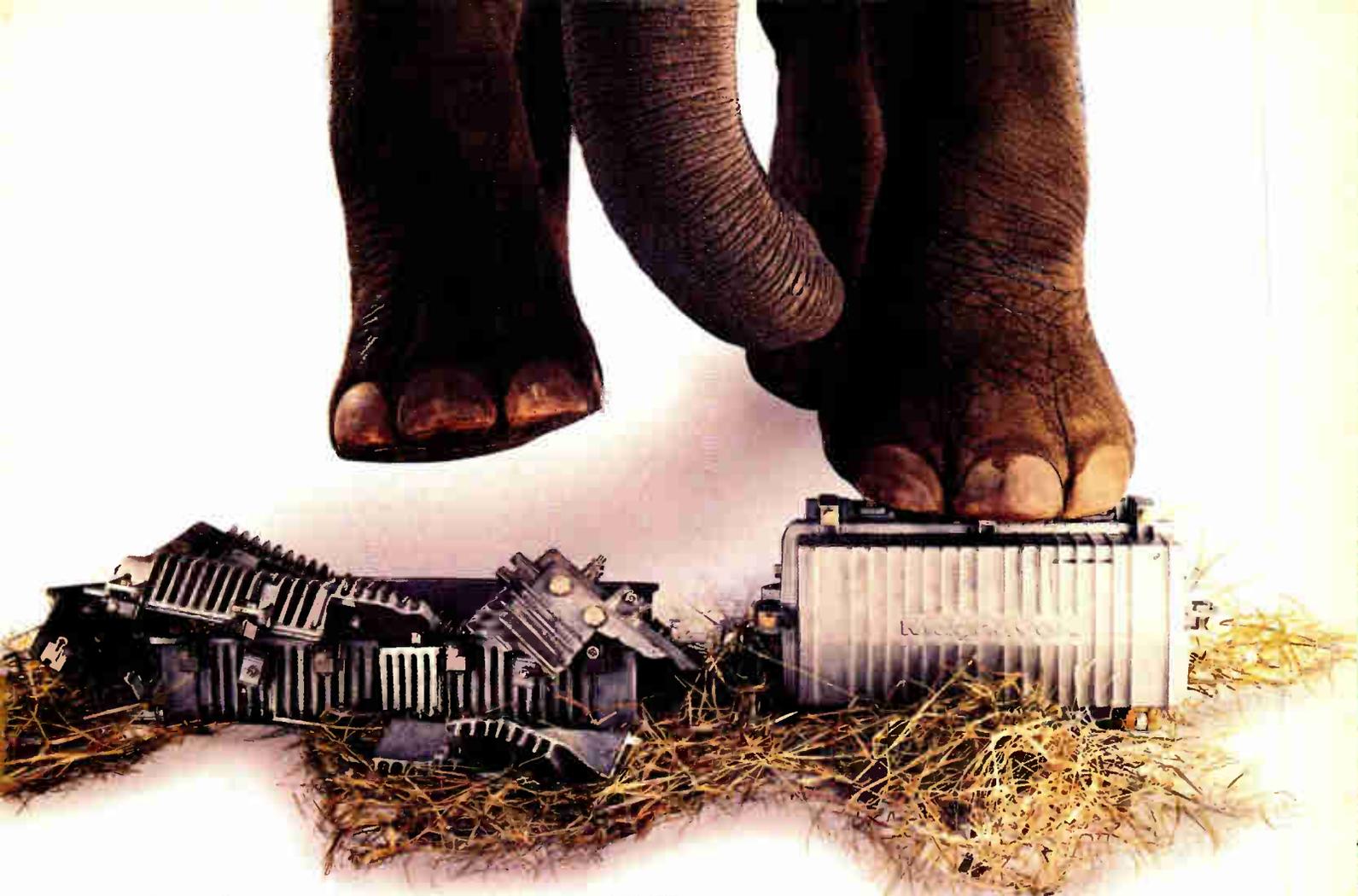


**Implementing
stereo audio**



**Leakage
detection:
How and why**

CATV Buyers' Guide



We're all under a Lot of Pressure!

YOU'RE UNDER A LOT OF PRESSURE.

Operating a cable TV system places you under a lot of pressure... the pressure to perform and to grow profitably. Especially since a minor equipment failure can cause a signal outage for many subscribers who remember only your mistakes.

WE'RE UNDER A LOT OF PRESSURE TOO.

We have to perform under pressure too, in order to make sure that our products will perform for you year in and year out. So we design for performance and endurance, use heavy-duty parts, manufacture with care, and test our equipment every step of the way. This means that nobody makes longer-lasting equipment than Magnavox!

SERVICE WHEN YOU NEED IT.

When you purchase equipment from Magnavox, you also receive the best warranty and repair service available... from Magnavox Factory Service.

And when you need field service, troubleshooting, and technician training, our Field Engineering Team and Mobile Training Center will be there to help you.

A TRADITION OF RESEARCH & DEVELOPMENT.

As a subsidiary of North American Philips, we carry its strong tradition of R&D into cable TV systems, with Powerdoubling™, Feedforward, and DSS Status Monitoring Systems.

And our advanced modular design gives existing systems the cost-effective flexibility to upgrade and add features.

WE HELP RELIEVE THE PRESSURE.

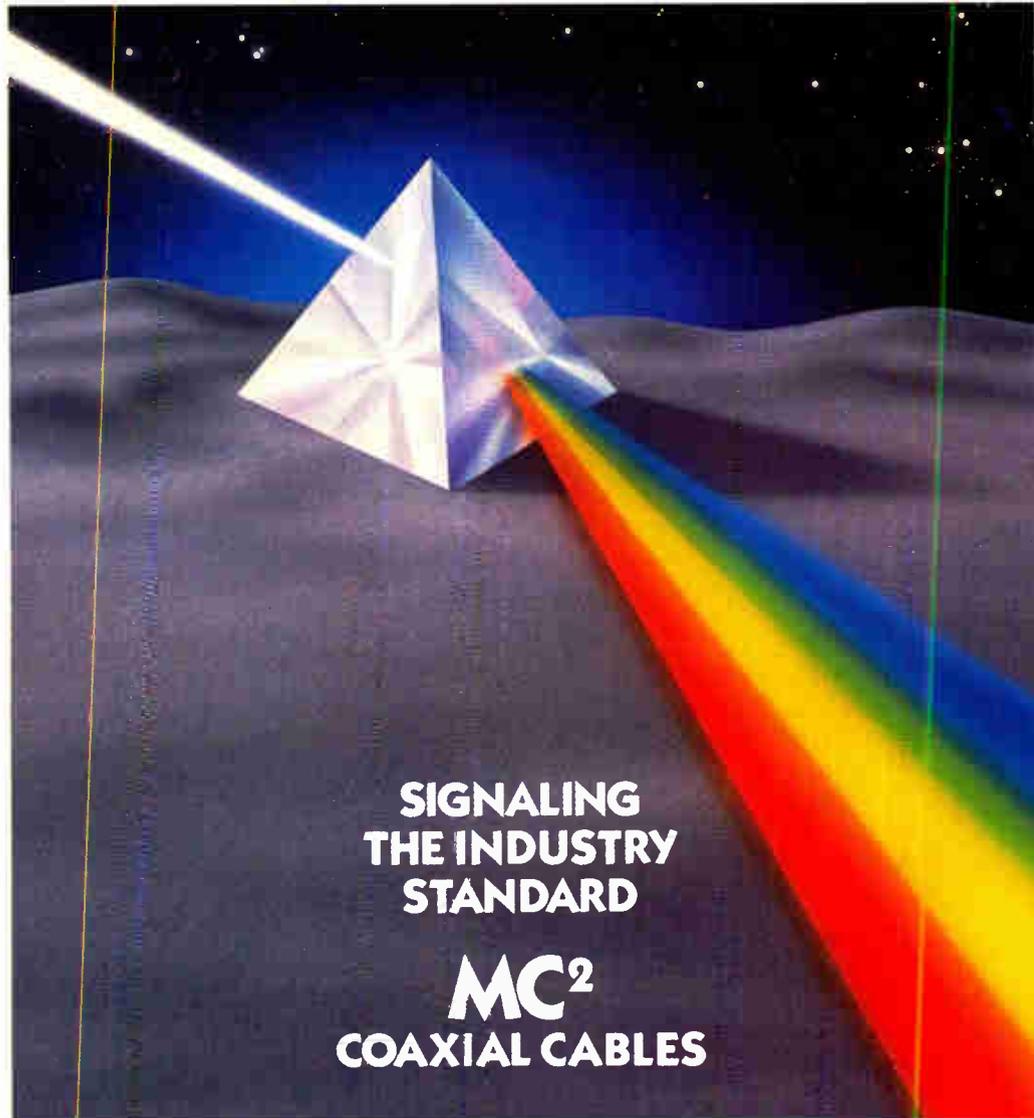
An unhappy subscriber never forgets. So don't lose profits and customers to unnecessary service calls. Install Magnavox equipment. Your system will operate smoothly and profitably, year after year!



A NORTH AMERICAN PHILIPS COMPANY
100 FAIRGROUNDS DR., MANLIUS, N.Y. 13104

FOR MORE INFORMATION CALL:
(800) 448-5171 In N.Y. State (800) 522-7464
Telex 937-329 Fax (315) 682-9006

GROWING STRONGER ALL THE TIME



**SIGNALING
THE INDUSTRY
STANDARD**

**MC²
COAXIAL CABLES**

Broad acceptance and rapid growth are familiar rewards for a company that provides the American marketplace with a superior product. "Build a better mousetrap..."

The company is Trilogy, and the product is MC².

The impact of MC² alone – with its air dielectric assuring a 93% velocity of propagation – has set a new industry standard for coaxial cables. Manufacturers of foamed cables have had to increase their diameters in order to approach the attenuation characteristics of MC².

Overnight success stories in the telecommunications industry can be short-lived, unless accompanied by farsighted commitments to industry needs that go beyond the most advanced product available. Consistent quality, assured availability, technical services, including problem-solving capabilities, and customer cost-effectiveness have always been important concerns of the Trilogy founders.

TRILOGY LEADS IN TECHNOLOGY



Trilogy

COMMUNICATIONS INC.

Call or write for a free sample and brochure:

TRILOGY COMMUNICATIONS INC., 2910 Highway 80 East, Pearl, Mississippi 39208

800-874-5649
601-932-4461

Reader Service Number 2

EDITORIAL

Gary Y. Kim
 Publisher/Editor
Kathy Berlin
 Associate Publisher
Roger Brown
 Managing Editor
Linda J. Johnson
 Production Editor
Paula Bley
 Research Assistant, CATV Buyer's Guide

CONSULTING ENGINEERS

Chairman
Wendell H. Bailey, NCTA VP, Science and Technology

Members
Jim Chiddix, VP, Engineering and Technology, ATC
Ron Coffen, VP of Engineering, Daniels & Associates
Bob Dattner, Consulting Engineer
John Dawson, VP of Engineering, Mile Hi Cablevision
Roy Ehman, VP of Engineering, Storer Cable Communications
Mark Elden, Consulting Engineer
Robert Luff, VP Technology, Jones Intercable
Steve Raimondi, Director of Engineering, US Cable Corp.
Graham Stubbs, Consulting Engineer
Sruki Switzer, Consulting Engineer
Joe Van Loan, Eng. VP, Viacom Cablevision

PRODUCTION

Jeff Knight, Production Director
Don Ruth, Art Director
Debra Rensel, Assistant Production Director
Debbie Van Dyke, Production Assistant
Dottie Sievers, Circulation Director

ADVERTISING

Cathy Wilson, National Sales Manager
Judy J. Medley, Account Executive, Classified Sales Manager
Christina Panczyk, Classified Sales

Patrick Kelleher, President/CEO
Janice L. Benesch, Controller

OFFICE

Denver 600 Grant Street, Suite 600,
 Denver, CO 80203 -or- P.O. Box 5208
 T.A., Denver, CO 80217, (303) 860-

0111. Fax (303) 837-8625.



INTERNATIONAL THOMSON
 COMMUNICATIONS INC.

©1987 by International Thomson Communications Inc. All rights reserved.
 CED. (USPS 300-510) (ISSN 0191-5428) is published monthly by International Thomson Communications Inc., 600 Grant St., Denver, CO 80203. ©October 1987, Volume 13, Number 10. Subscriptions free to qualified industry readers. All other one-year subscriptions are \$26, prepaid in U.S. funds only. Second-class postage paid at Denver, CO. and additional mailing offices. CED is published on behalf of the cable television and broadband communications industries. POSTMASTER: Please send address changes to P.O. Box 5208 T.A., Denver, Colorado 80217. MEMBERS OF THE BPA.

SPOTLIGHT

A century of development **8**

When Heinrich Hertz confirmed the presence of electromagnetic radiation in 1887, he knew it was important. But he'd probably be surprised how much we've taken advantage of it.

CLASSICS

More on delay distortions and their effects **23**

The second half of this paper, written by Fred Schulz (then with Sterling Communications in New York City), gives more details about delay distortions, focusing on how to measure them and their effects.

A tidal wave or a ripple? **32**

Implementation of fiber optic cable to distribute CATV signals has often been described as a long way from happening, but at least one major MSO has plans to start installing it before the decade is out.

Need to know who does what? **35**

Then look it up in the annual CATV Buyer's Guide. This comprehensive listing of all the players in the cable game should serve as your "yellow pages" of the industry. Keep it handy.

Get to know your leakage detector **93**

Ron Wolfe of ATC says never to leave home without your leakage detector. Why? Because the FCC is serious about reducing the number and severity of leaks in cable plants.

BROADBAND LAN

Distortion testing **96**

Basic measurements and tests for distortions in broadband LAN distribution systems, including second order, composite triple beat and crossmodulation, are explained in this paper by Rezin Pidgeon of Scientific-Atlanta.

Planning on implementing stereo sound? **106**

But confused about what audio processing equipment you need? Gary Rogalski of Nexus Engineering gives the reader an understanding of how audio is processed in various pieces of equipment so an intelligent decision about how to implement stereo service can be made.

DEPARTMENTS

- My Turn** 12
- Frontline** 16
- From The Headend** 18
- LANWatch** 105
- Classifieds** 114
- In The News** 116

About the Cover

Fiber optic is the wave of the future. One large MSO is already jumping on the bandwagon and others are looking at its potential uses for the cable industry. Photo by American Stock Photography.



THE STEREO ENCODER SO ADVANCED, IT SOUNDS GOOD EVEN IN PRINT.

- Frequency response goes to 15 KHz: ± 0.5 dB, 50 Hz to 14 KHz; -3 dB at 15 KHz.

- Encodes discrete left and right channel baseband inputs into BTSC format.

- Compact single-rack unit saves space.

- Built-in calibration test tone.

- Optional internal 4.5 MHz modulator.

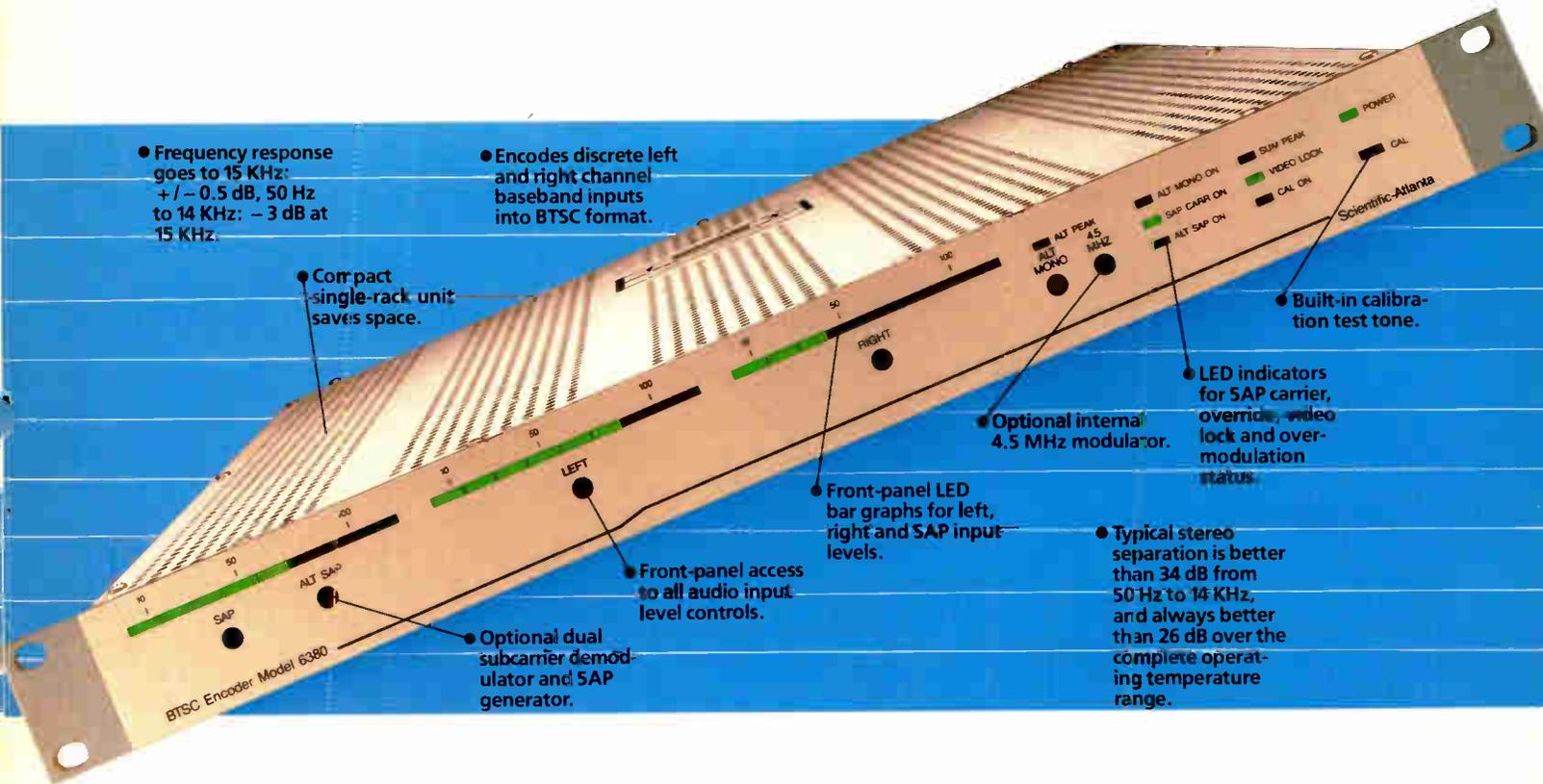
- LED indicators for SAP carrier, override, video lock and over-modulation status.

- Front-panel LED bar graphs for left, right and SAP input levels.

- Typical stereo separation is better than 34 dB from 50 Hz to 14 KHz, and always better than 26 dB over the complete operating temperature range.

- Front-panel access to all audio input level controls.

- Optional dual subcarrier demodulator and SAP generator.



You couldn't pick a better time to offer stereo TV. Because there's never been a better BTSC stereo encoder than the Scientific-Atlanta 6380. And the more you hear about it, the better it sounds.

Everything about the 6380 was designed to make your life easier. For example, a built-in calibration test tone allows you to adjust for maximum stereo separation without a lot of expensive test equipment.

All major controls and indicators are located on the front

panel for easy monitoring. And every unit is factory tuned and tested to ensure precise, consistent performance.

But don't let all these features fool you. The 6380 only sounds expensive. It's actually an economical way of enhancing your service without adding channels. And in the bargain, you get the same Scientific-Atlanta quality that goes into the rest of our full line of headend equipment.

If you think our 6380 stereo encoder sounds good in this ad,

you haven't heard anything yet. Call us for more information at **1-800-722-2009** or write to Scientific-Atlanta, P.O. Box 105027, Dept. AR, Atlanta, GA 30348.

Scientific Atlanta

THE LAST FEW FEET AS THE FIRST

It would be a shame for T&D or dropwire to be shipped hundreds, maybe thousands of miles, only to be damaged during transit or off-loading.

It would be more of a shame if that damage didn't show up until after the cable was installed.

That's why so many Comm/Scope trucks are equipped with Wayne CargoMaster[®] cranes. It's why our drivers are trained to handle cable as skillfully as they handle hairpin turns. And it's the reason our trucks travel millions of miles each year bringing cable directly to our customers.

GEN
INSTRUM
COMM/SCOPE



AREAS AS IMPORTANT AS 1000 MILES

A lot of companies promise quality and service. At Comm/Scope we deliver.
For more information, please contact your Comm/Scope Representative or call us direct at 800/982-1708
(800/222-6808 in NC).

COMM/SCOPE. WITH YOU ALL THE WAY.

Comm/Scope Division, General Instrument Corporation, PO Box 1729, Hickory, NC 28603, 800/982-1708 (800/222-6808 in NC), Telex: 802-166

Reader Service Number 4

**GENERAL
INSTRUMENT
DIVISION**





Heinrich Hertz

100 years later

Hertz sets stage for today's means of communication

The lecture hall was dark, yet someone was there. But more importantly, faint sparks could be seen jumping across the gap in the unclosed loop of wire. Young Heinrich was ecstatic.

By moving the detector to different locations in the hall, Heinrich was able to measure the length of the electric waves being produced. By taking the length and the calculated frequency of the oscillator, the velocity of the waves was determined to be 186,000 miles per second, the same as the velocity of light.

Heinrich was elated because he understood the significance of his findings. By demonstrating that the waves were of the same type as those involved in the propagation of heat and light, he confirmed James Clerk Maxwell's mathematical theory that electromagnetic waves did indeed exist and had the same velocity as light.

Through a series of experiments 100 years ago, using an unclosed circuit connected to an induction coil and a detector consisting of nothing more

than an unclosed loop of wire, Heinrich Hertz was the first to confirm the existence of electromagnetic radiation, setting the stage for the development of modern radio, television and the wireless telegraph.

Hertz was born into a prosperous and respected family in Hamburg, Germany, in 1857 as the eldest of five children. His childhood was filled with private schools and demanding teachers and he was often at the head of his class in every subject he studied. He went to Frankfurt to prepare for a career in engineering, but he soon realized he was not interested in leading an ordinary life. Instead, he longed for a life of never-ending study and research which the university environment could provide.

After a year at the University of Munich, where Hertz developed a strong mathematical talent, he made the fateful move to Berlin where he came in contact with Hermann von Helmholtz, who was to become his mentor. Shortly after his arrival in Berlin in 1878, Hertz saw an announcement concerning a prize offered by the Berlin Philosophical Faculty for the solution of an experimental problem concerning electrical inertia. Hertz began work immediately and Helmholtz, who proposed the problem, monitored Hertz's progress daily.

A disciplined researcher who truly loved his work, Hertz won the Philosophical Faculty Prize in 1879, earned a medal and had his work published in 1880. He had also gained the respect of Helmholtz.

Toward the end of his work on the Philosophical Faculty problem, Helmholtz approached Hertz with an offer to tackle another, more valuable, prize offered by the Berlin Academy. It concerned an experimental decision on the critical assumptions of Maxwell's theory. Hertz, however, declined the challenge, noting that it would take three years to complete and the outcome was anything but certain. Instead, he went on to other projects.

After earning magna cum laude honors at Berlin in 1880, Hertz began a three-year stint as Helmholtz's assistant at the Berlin Physical Institute. There he was able to join the inner circle of German physics and his reputation grew. Nevertheless, his ambition

to become a regular faculty member took him to Kiel in 1883, where he became a successful lecturer. However, the small Kiel university lacked a physics laboratory and Hertz grew increasingly frustrated.

In 1885, the Karlsruhe Technische Hochschule hired Hertz as a physics professor and it was here that he was to begin his famous experiments. Between 1885 and 1889, he published nine papers based on his electrical research, won medals and prizes from a number of respected institutions and was elected to several major scientific societies.

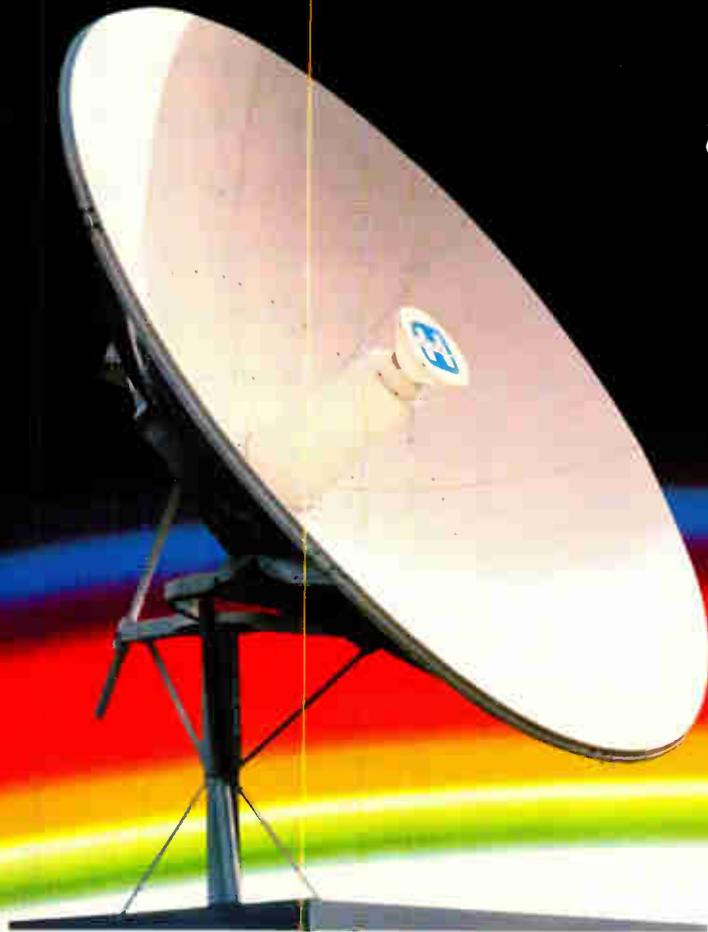
At about the same time he went to Karlsruhe, he began to complain of toothaches. In the midst of his later electric wave experiments he had his teeth operated on and finally, in 1889, he had them all pulled. That provided some relief, but by 1892, his nose and throat began to hurt so badly he had to stop working. A variety of remedies provided no relief and his condition worsened so that he was in almost constant pain. He had several head operations to correct a malignant bone ailment that his doctors didn't understand very well. He went back to lecture, but only sporadically. On Dec. 3, 1893, he sent the majority of the manuscript for his book on mechanics to the press. On Dec. 7 he gave his last lecture. On New Year's Day of 1894, at the age of 36, he died of chronic blood poisoning.

It took the interest and investigations of others (most notably Guglielmo Marconi) to develop commercial uses for Hertz's discovery, but from a research viewpoint, it was Hertz's work that was seen as truly innovative in his day. In fact, the devices he used to produce and detect the waves were perhaps the things he was most proud of.

It took the hindsight that the passage of time provides for many to realize that Hertz did more than detect electromagnetic radiation. He is often credited with bringing the study of electrodynamics into a more ordered state. Before his discoveries, a variety of theories, each based on differing criteria and each having their proponents, were advanced over the 50 years prior. Hertz's work became more important than even he would have believed.

—Roger Brown

Harris Quality Midwest Pricing and Delivery



\$1,295.⁰⁰

Model 5115-AZ includes AZ/EL mount and dual polarity feed.

The Harris 3-meter C-Band Delta Gain™ Antenna gives you more than an impressive 41 dB gain. It's also rugged enough to withstand 120 MPH winds. Plus, it's easy to install and available with either an Az-El Mount or a Polar Mount with optional motorization.

The Harris 6529-2 Frequency Agile Receiver is the updated version of the popular 6529. It is a 4 GHz input receiver, so if you have an older system you can get the excellent picture quality of the 6529-2 without the added cost of installing an external down converter or new plumbing. Plus you get one of the best warranties in the industry – two years on parts, labor and workmanship.

As one of the world's largest stocking distributors of Harris equipment, Midwest has these, and other Harris products, on hand and ready to ship – instantly. Midwest provides complete systems or individual components for either C or Ku-Band, fixed or mobile, Up-link or TVRO.

For the best prices and fastest delivery in the industry, contact Midwest at 800-543-1584.

\$695.⁰⁰

Model 6529-2



MIDWEST

Communications Corp.

One Sperti Drive
Edgewood, KY 41017

800-543-1584
(In KY 606-331-8990)



European television

Part II: Cable TV

Europeans have said to me that the coaxial cable and electronic equipment used in American cable TV is so cheap, low quality and short-lived, it has to be replaced every seven years or so. They say that proof of American inferiority is the terrible quality of the pictures delivered to subscribers. Some suggest our problem stems from our network topology, commonly referenced as the "Same Tired Old American Tree" (a STOAT is an ermine in its dull, brown, unlovely summer coat).

Is the technical quality of American cable TV as poor as some Europeans seem to think?

If their judgment is based on viewing in hotel rooms, bars or airport lounges, it is certainly biased, but understandable. Even in cabled communities, hotels are frequently not connected to the cable network. When they are, the cable operator may not be responsible for the often poor quality of the internal MATV distribution wiring. Moreover, the age and condition of TV sets in hotel rooms is notoriously poor. My own limited experience in Europe suggests they probably face the same problems, not only in hotels but in the independent MATV systems in the community housing compounds that are much more widespread there.

European cable TV networks typically carry eight to 15 channels. Many carry six or fewer, and none carry more

By Archer S. Taylor, Senior Vice President, Engineering, Malarkey-Taylor Associates Inc.

than 30. What American cable TV network would not perform better technically if it were required to carry only a dozen or so non-adjacent channels, without converters, instead of 60 to 80?

European cable TV hardware differs from American in several respects. Coaxial cable with copper inner and outer conductors is required by some national authorities, and preferred by others. Construction is similar to Trilogy MC², with an inner dielectric sheath and discrete disc spacers. In Europe, it is called "Bamboo" cable, and is identified by the attenuation in dB per 100 meters at 230 MHz. Bamboo 1.5 is roughly equivalent to TFC 1.160, or MC² 1.000; Bamboo 3.0, to TFC 565, or MC² 500. The attenuation of Bamboo 6 is between that of RG-11 and TFC 412. The outer conductor of Bamboo cables is fabricated by wrapping a longitudinal copper tape around the dielectric, with a lapped joint, neither welded nor cemented. Foam polyethylene cables with welded seam corrugated copper or seamless aluminum are also manufactured and used, where permitted.

European trunk and feeder repeater stations appear to be quite comparable to American equipment, with respect to operational output levels and cascading. Trunk amplifiers are also available with 15 to 17 dB gain. However, since the noise figure is 2 to 3 dB higher, the advantage of the lower gain is not apparent.

Intermodulation is generally specified according to the German standard DIN-45004B, calculated on the basis of a three-tone measurement. The German method includes a reference tone, a second tone 6 dB below the reference level at a frequency difference of 14 MHz, and a third tone 12 dB below the reference at a frequency difference of 11 MHz. The DIN-45004B specification is the theoretical maximum output level at which the intermodulation products at ± 3 MHz from the reference carrier would be 60 dB down. For N-channel loading, DIN-45004B specifies reducing the measured three-tone maximum rated output level by $7.5 \log(N-1)$. Allowances for further level changes and cascading are calculated in accordance with the usual well-known theory.

A far more realistic set of technical

standards was first published by the International Electrotechnical Commission in 1982, revised in 1986. There is indication that DIN-45004B may soon be modified to conform with IEC Publication 728-1, which generally follows the NCTA *Recommended Practices*. Until equipment suppliers specify performance according to IEC 728-1 however, it is difficult to compare European and American intermodulation performance.

Many existing European national standards require 40 to 50 dB isolation between subscribers. Most European taps, therefore, provide at least 40 dB tap-to-tap isolation up to 300 MHz and about 35 dB above. IEC Publication 728-1 specifies only 22 dB, but assumes that frequency assignments have been planned to avoid local oscillator interference (see Mike Jeffers' paper at NCTA 1970). Without such planning, 46 dB isolation is specified.

For the most part, IEC 728-1 is quite consistent with American experience and practice, as set forth in NCTA *Recommended Practices*. Moreover, IEC covers, in a reasonable way, a great many issues not yet addressed by NCTA. IEC Publication 728 expresses the international consensus of opinion of the participating National Committees regarding standards for cable TV. It has not, however, been widely adopted.

In Europe, the switched star cable TV network topology is considered the wave of the future; the tree and branch, or STOAT, obsolete. It is clear from my own investigations, as well as European comments, that the value of the switched star lies mainly in its technical superiority over tree and branch for full duplex (i.e., two-way) communications.

In America, we have systematically discovered, first, that no significant marketable interest has yet been demonstrated in two-way home services; and, second, that no two-way home services have yet been clearly identified that cannot equally well or better be provided by using the dial-up telephone system for return transmissions.

In Europe, the major cable TV systems are owned by, or closely associated with Telecoms, Bundesposts, Televerks or PTTs. Switched star networks, especially those using optic

BEAUTY AND THE BTSC

Jerrold's COMMANDER® MTS Stereo Encoder



Black-and-white video on a color TV. Mono audio from a stereo TV. Sounds drab, doesn't it?

Now there's a way to brighten up the situation: Jerrold's COMMANDER® MTS BTSC stereo encoder.

Any BTSC stereo encoder can encode your satellite-delivered signals into stereo. But only the COMMANDER MTS can guarantee both you and your subscribers the quality sound you want and deserve. It actually exceeds all broadcast performance requirements.

With the COMMANDER MTS stereo encoder you hear everything you're supposed to hear in clear, clean BTSC multichannel sound. And nothing else.

So do your subscribers.

That's because Jerrold's COMMANDER MTS is the only stereo encoder with non-clipping over-modulation protection! There's no way the annoying pops, cracks and distortion that comes from erratic audio input levels can get through to your subscribers, because the CMTS just won't broadcast them. It's designed to deliver pure sound only—even when the signals it receives are something less than constant.

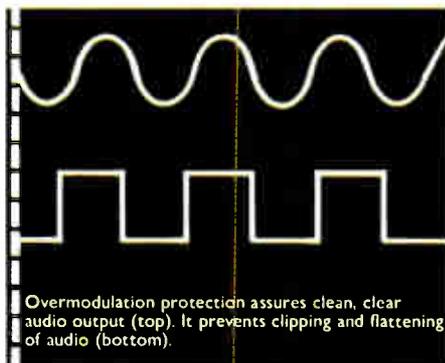
But that's not the only reason to install a Jerrold CMTS encoder. There's also the broad deviation range of the logarithmic LED metering which makes it easy for you to set—and maintain—correct audio levels. There's dramatically low power consumption. And, Jerrold is the only manufacturer to offer standard

41.25 MHz and 4.5 MHz output so that your encoder will work with almost anybody's modulator without modification.

Finally, when you're ready to upgrade to Second Audio Programming, the CMTS is ready. SAP is easily field-upgradable without adjustment.

It's all there in one attractive package. The Jerrold COMMANDER MTS Stereo Encoder: your sound investment.

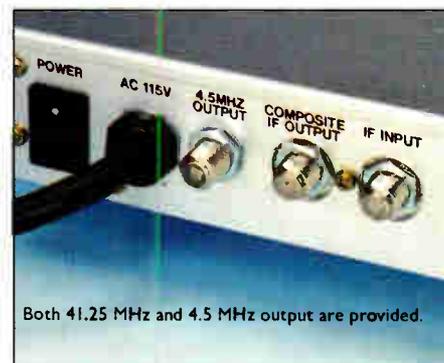
For more information on the Jerrold COMMANDER MTS Stereo Encoder contact your local Jerrold Account Representative or call or write Jerrold Division, General Instrument Corporation, 2200 Byberry Road, Hatboro, PA 19040 (215) 674-4800.



Overmodulation protection assures clean, clear audio output (top). It prevents clipping and flattening of audio (bottom).



Logarithmic parallel LED metering shows you correct separation at a glance.



Both 41.25 MHz and 4.5 MHz output are provided.

JERROLD

... where innovation is a tradition

GENERAL INSTRUMENT

American broadcasters are facing a major challenge to find suitable spectrum to accommodate HDTV.

fibers, can easily merge into future ISDN or similar integrated voice, data and video networks. Coaxial tree-and-branch remains the most efficient network topology for one-way, point-to-multipoint, low cost, high quality entertainment distribution to homes.

Television in Europe is changing. Six satellites already in orbit relay at least 30 programs for cable TV in at least a half-dozen languages, including Russian. Some programs are provided with text subtitles in another language, and some more expensive programs are dubbed with lip-synch translations.

A major feature of the MAC family of encoding for satellite transmission is the multilingual capacity for at least four separate sound channels. The European Community, Britain, France, Germany and the Nordic group plan to orbit DBS platforms in the next year or so, with two or three high-powered transponders each.

Tiny Luxembourg, with a population

scarcely half that of the District of Columbia, generated considerable consternation by authorizing a privately financed company to launch the ASTRA satellite in 1987. The failure of the Ariane launch vehicle early this year has forced a delay to at least June 1988. Meanwhile, Eutelsat, the major continental player, has put seemingly serious legal obstacles in ASTRA's way. (Incidentally, W. Sherwood "Bud" Campbell is head of systems engineering for ASTRA.)

With satellites laying their footprints all over the map of Europe, showing only token regard for national boundaries, it is simply inevitable that national efforts to restrict the type and variety of TV programming will decline, and cultural interchange grow, for better or worse.

European cable TV operators are about to experience the joy and pain of set-top converters, called "setups" by some who are misled by our careless pronunciation. As satellite program-

ming continues to proliferate, converters will be needed to overcome the capacity limitation of European TV sets, most of which are restricted to from four to 10 or 12 channel selector push buttons. TV sets are now available with digital channel selection, including the so-called "S-channels," equivalent to our mid and super bands, and good adjacent channel selectivity. However, the turnover rate is probably even slower than in the U.S.

American broadcasters are facing a major challenge to find suitable spectrum to accommodate HDTV. American cable TV operators are facing the challenge of improved, clean, sharp television pictures that will surely be presented before Christmas 1987 by a new generation of VCR. Cable TV operators who have recently built or rebuilt systems to modern 60- or 70-channel capacity should have plenty of available spectrum with which to meet the challenge. To meet it successfully, however, probably calls for a higher level of overall technical excellence than is presently displayed, not merely to generate profits, but perhaps just to survive.

European cable TV operators may also have some problems meeting the same challenge. While scorning the American short-term investment philosophy, Europeans may find that even with their expensive, long-life interconnecting networks, independent MATV distribution systems in the many individual housing compounds are not good enough for the new, wider band, high quality signals. Finally, although Europe seems likely to settle on one or more members of the MAC family for satellite transmission and security, they still have to deal with the cost vs. security issues for home pay-TV. It may not be possible to keep ahead of the pirates at reasonable cost, on a long-term basis.

It is my tentative conclusion that American cable TV is probably not as bad as the Europeans seem to think. At the same time, I suspect that, considering the interconnected housing compounds and some "fly by night" operations, it would not be hard to find poor cable TV pictures in Europe. I would guess that the best American cable TV is probably about the same, overall, as the best European cable TV.

CASH FOR CONVERTERS!

IN SEARCH OF USED CONVERTERS!

I'VE POUNDED
PAVEMENT LONG
ENOUGH! SEND
PTS-KATEK YOUR USED
CONVERTERS! THEY'LL
SEND YOU COLD CASH!
DO YOURSELF A FAVOR,
CHUM, AND GET RICH!

PTS/Katek buys, sells and
repairs cable equipment.
Call 1-800-441-1334.

PTS Katek
The Converter Specialists

110%

That's the kind of effort we put out. Because that's what it takes to become the leading CATV standby power system manufacturer in North America. That's what it takes to design the technology that sets the standards in the industry. And that's what it takes to beat the competition.

Efficiency. Alpha has developed standby power supply transformers rated at 94% efficiency – the highest in the industry. And this without sacrificing quality, thanks to superior engineering.

Cost of Ownership. Alpha systems cost less because our efficiency, reliability and performance monitoring result in lower maintenance and operating costs.

Modularity. Alpha pioneered functional modularity. Just add simple plug-in components

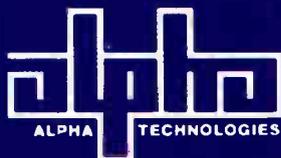
and your standby power system is updated with the latest innovations from Alpha's R&D labs.

Uninterrupted Power. Alpha's transfer time is so immediate that we offer standby power with the advantages of uninterruptible power. Uninterrupted power means uninterrupted service to your subscribers.

Innovation. We're never content. We're always looking for ways to improve. That's why the industry looks to Alpha for innovations in standby power. Single ferro-resonant design. Temperature compensation. "Smart" battery charging. Performance monitoring. Status monitoring. Major innovations resulting in real bene-

fits – and all introduced by Alpha Technologies.

And have we finished yet? Don't bet on it.



We're Here to Back You Up.

3767 Alpha Way Bellingham, WA 98225
206-647-2360 FAX: 206-671-4936

7033 Antrim Ave. Burnaby, B.C. V5J 4M5
TELEX: C4-356760 FAX: 604-430-8908



Let's meet S-VHS head-on

Just a few weeks ago, at an NCTA Engineering Committee meeting, Paul Perez of Recoton Corp. asked if he could give a demonstration of a truly remarkable development to the engineering group. As Paul is a valued member of the committee and he rarely brings anything to the attention which isn't of great interest to its members, we readily agreed.

What we were shown was the very latest in VCR technology: Super VHS by JVC. Super VHS makes possible resolution on the order of 440 lines (about the best possible on a home television from either broadcast or other delivery means is 300 lines or so). The picture was spectacular. True, the VCR deck and the television set on which the picture was displayed were both special. The special part was a new connector called a Y/C connector which delivers separate luminance and chrominance signals to the TV set.

S-VHS is compatible with existing television sets. If a regular tape is played on a Super VHS machine, you will get quite a nice picture on your regular television with either base-band video or RF inputs. You would get

*By Wendell H. Bailey, Vice President,
Science and Technology, NCTA*

a very nice picture on the new Super VHS tapes on a Super VHS machine into a TV equipped with the Y/C connector input.

While this particular format is called Super VHS, I should point out that the Beta folks have not stood idly by. In fact, Sony has its own version, called Extended Definition Beta or ED-Beta. For the first time since television was born, the average consumer will be able to see pictures of a quality comparable to what the studio technicians see on their expensive studio monitors. No other mode of delivery can equal this at this time.

Up until now, the well-built and maintained cable system has been able to deliver a picture with a quality comparable to that of an average VHS VCR playing a pre-recorded tape. With the introduction of these high bandwidth, component-style VCR formats, however, it is possible that the consumer will see pictures with considerably more resolution than what they have been used to seeing.

This raises several questions for the cable industry as we begin to study possible involvement in the delivery of high definition television. The cable industry is part of a group called the Advanced Television Systems Committee, based in Washington, D.C., which has been studying the implementation of high definition television as well as improvements in existing television systems. To date, this group has agreed on a standard for the studio production of high definition television. This standard has not been adopted worldwide, but it is being used in this country and others for the production of program material. This may be its most important role, but what seems to get cable operators' interest when HDTV is discussed is the possible transmission formats for HDTV and how they will be handled on cable.

How HDTV will be transmitted is still very much an open question. The same people who developed the HDTV studio standard (NHK, the Japanese broadcasting authority) have proposed a transmission system known as MUSE. This system takes a bit more than 8 MHz to transmit a signal that displays their version of high definition television.

One important parameter of the

NHK system is its aspect ratio (ratio of width to height), which is 16 to 9, as compared to the NTSC aspect ratio of 4 to 3. One of the questions the cable industry will wrestle with is the importance of this particular parameter when compared to the issues of resolution and quality sound.

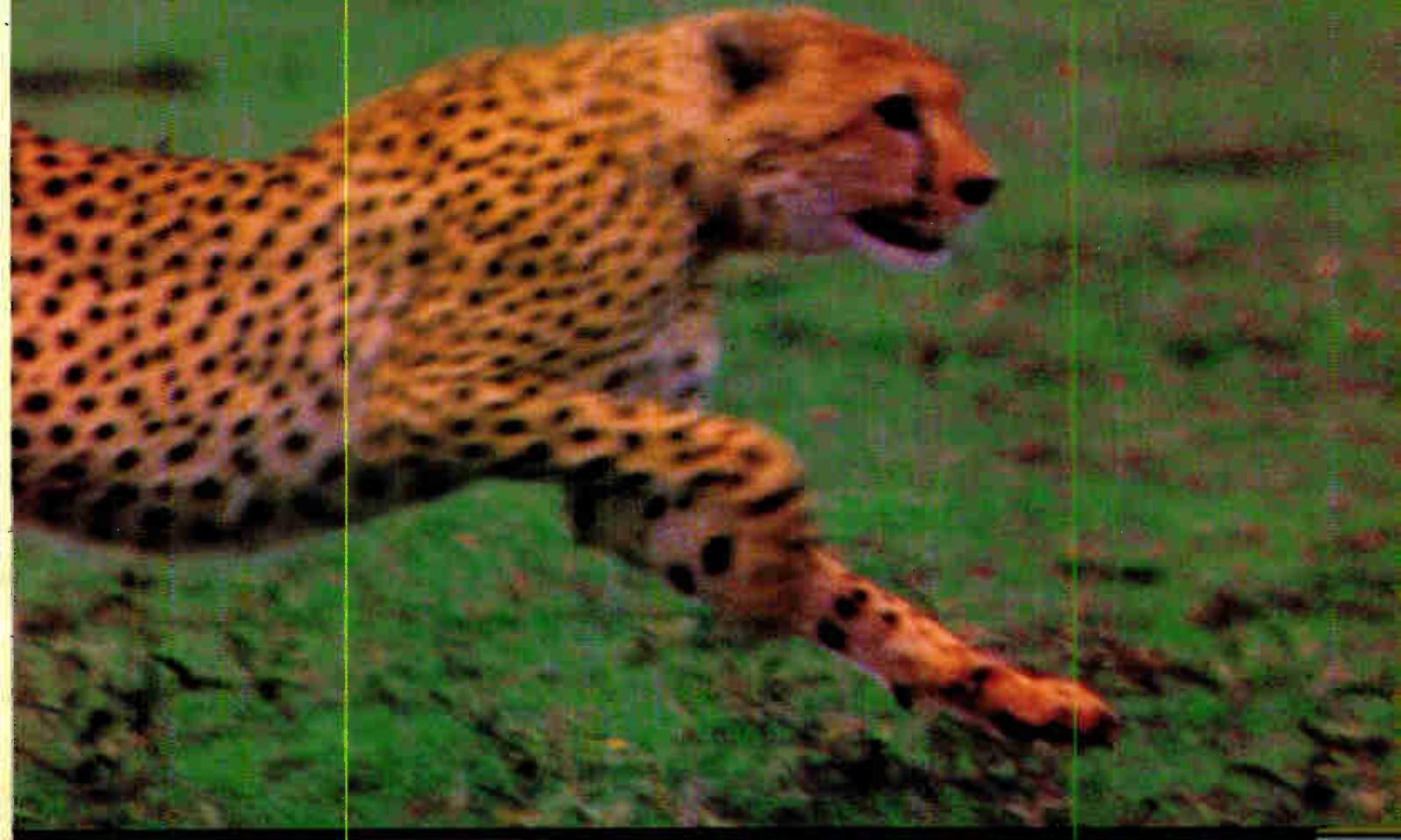
At a recent NCTA Engineering Committee meeting, a new subcommittee on high definition television was appointed under the chairmanship of Nick Hamilton-Piercy of Rogers Cable-systems. Of the variety of issues and concepts with which he will struggle in the upcoming months, one of the hardest will be exactly what we mean by high definition television.

A recent subcommittee decision has been to form a task force to look into Super VHS and the ability to transmit it on cable systems. Understanding of the possibilities of technology such as this are important to the overall thrust to improve picture quality.

In the meantime, however, there are more mundane and day-to-day problems which we face that have an impact on how our customers view the signals which we deliver. You must ask yourself how your customers will react to the pictures of the quality that Super VHS or ED Beta can deliver when compared to what they see every day. We already know that cable provides a better signal than most people get off the air. This is one of the reasons why consumers connect to cable and, up until now, cable has compared favorably with home recordings as well as tape rentals in terms of signal quality.

Now there will be a new standard to shoot for. There is no doubt we can all improve the quality of pictures on our cable systems by meticulous attention to detail during maintenance and alignment of components in the system. This isn't just maintenance of all of the cable headend and the receiving equipment which we use to acquire signals—antennas, satellite dishes, etc. If you put the utmost effort into the task of making sure your system can transmit the best pictures possible, then the comparison between your signal and Super VHS can show that, while you might not be as good as Super VHS, you are significantly better than any other technique or delivery system except this new animal.

Quick Service



Quit pussyfootin' around with slow service. For fast response, call MIDWEST CATV.

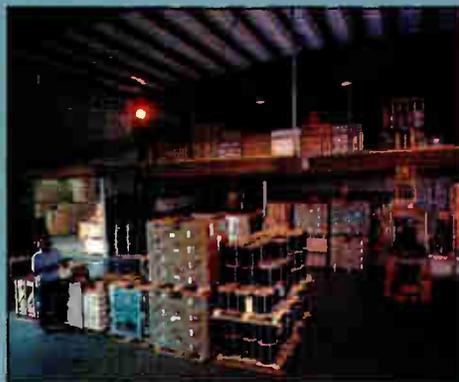
At speeds of 70 mph, the cheetah is slow compared to the service at Midwest CATV. We're fast, efficient and dependable.

Count on us every time for a complete full-line inventory, including several brands of cable, distribution gear, converters, accessories and test equipment. We handle only the best products from a number of suppliers. Call us first to get what you need fast.

Midwest CATV maintains a full inventory in every region of the country. Computerized inventory systems speed the specific product you need to your site from our regionally located warehouses. And the hands-on experience of

our knowledgeable sales staff keeps us true to our word—**More than supplies. Solutions.**

When you need it *now*, call Midwest CATV. Our service runs circles around the fat cats.



Charleston, WV (1 304 343-8874)
Sewell, NJ (1 609 582-7222) Outside NJ (1 800 521-6243)
Virginia Beach, VA (1 804 468-6444)
Within VA (1 800 421-2288) Outside VA (1 800 643-2288)
Clarksburg, WV (1 304 624-5459) Outside WV (1 800 532-2288)
Lafayette, IN (1 317 448-1611)
Within IN (1 800 382-7526) Outside IN (1 800 428-7596)

MIDWEST CATV

Quick! Send me more information.

Name

Title

Company Name

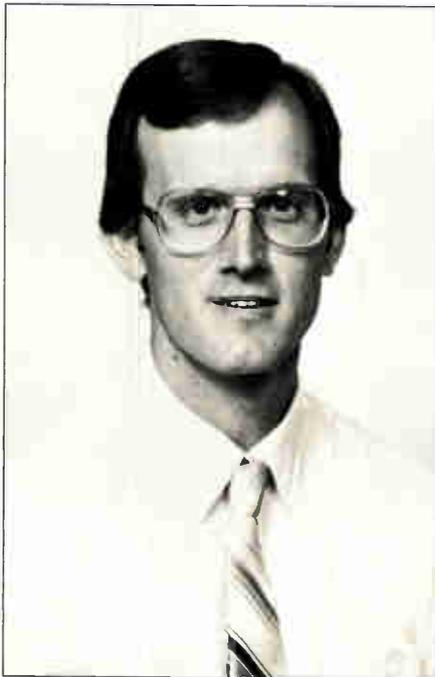
Address

City State

Zip Phone

Mail to: Midwest CATV, Box 271, Charleston, WV 25321

.....



Subjective effects of differential gain and differential phase

Have you ever found yourself in a lively "video" conversation when the subjects of differential gain or differential phase have not been mentioned? Probably not. It seems that at the first mention of video performance, most of us can't help but to allow the word "differential" to pass our lips. In fact, these two parameters are revered for their ability to help us differentiate (there it is again) between the "good" and the "bad."

But think about it for a minute, have you ever seen it? Have you ever really seen, in an actual television picture, an impairment which might be recognizable as either differential gain or differential phase? Chances are that yes, you have seen the impairment, but that no, it might not have been recognizable as either type of video degradation. For that reason, this month's column will deal with the subjective

effects of both differential gain and phase.

Differential gain is defined as an unwanted variation in the amplitude of the chrominance information as the luminance information varies from blanking to reference white. Since it is the amplitude of the chrominance information that defines the saturation or "depth" of the color, and since it is the amplitude of the luminance information that defines the instantaneous "brightness" of the scene, differential gain can be defined as an incorrect saturation or depth of color which varies with the brightness of the scene.

The most common form of differential gain which occurs in CATV equipment, such as modulators and demodulators, is a compression (reduction) in the amplitude of the chrominance signal as the brightness of the scene increases. If we pass the color red through such a network, the amplitude of the chrominance information will be reduced, producing a new, less-saturated shade of red, which in fact might be pink. As you can imagine, this type of saturation error can be difficult to detect for the uninitiated because the brightness of the scene by itself can tend to give the viewer a perceived difference in the saturation of the color without differential gain even being present. Bright scenes can tend to give the perception of "washed out" color (especially when the viewer's brightness control on his monitor is improperly adjusted).

But consider the following example as an extreme case of a system with differential gain problems: Envision a beautiful red car being driven along a shady country road. Suddenly, a break in the shade allows the sun to shine through, creating a wonderfully brilliant scene with a cute pink car. To make matters worse, every time the car pops in and out of the shade, it changes color from red to pink. Granted, that's an extreme example, but at least you should understand the concept. In a more likely scenario, with normal amounts of differential gain, you might not even notice the subtle changes in the saturation of a color with changes in the brightness of the scene.

Differential phase, on the other hand, might be more easily recognized by a casual viewer. In this case, it is the

phase of the chrominance signal which is disrupted with changes in the brightness of the scene. Since it is the phase of the chrominance signal which carries the actual color or hue information, differential phase will appear as a change in the actual color of an object (as opposed to its depth of color) as the brightness of the scene varies.

A classic example of an extreme case of differential phase distortion would be an individual standing outside on a sunny day while wearing a baseball cap. The sun's placement in the sky is such that the bill of the baseball cap casts a slight shadow over one-half of the individual's face. What we would expect to see without differential phase distortion being present, is a bright flesh tone on one side of the individual's face, and a less bright flesh tone on the shaded side of his face. A severe case of differential phase, however, could cause either half of the individual's face to appear either slightly green, or perhaps slightly magenta depending upon whether the shift in phase were either positive or negative. In the previous example of the bright red car traveling in and out of the shade on a country road, a severe case of differential phase distortion could cause the car to actually change colors like a chameleon; from red to orange, for example.

Several interesting studies have been conducted over the years to investigate the threshold of viewability for differential gain and differential phase distortions. These studies were typically conducted with "expert" viewers who were technically trained and experienced at recognizing TV picture impairments. The results of these studies have shown that differential gain and differential phase are not only difficult to recognize, their threshold of viewability is dependent upon the shape and polarity of the degradation. Even so, the next time you are watching a baseball or football game on TV, pay particular attention to subtle changes in the color of the playing field at the boundary between the shaded and sunny sections of the field. Then, with a smile on your face, a twinkle in your eye, and a beer in your hand, turn to your buddy, point to the TV and say, "Yep. Just as I thought, differential phase." I'm sure he'll be impressed.

By Chris Bowick, Engineering Dept. Manager, Scientific-Atlanta

SPECIAL INTRODUCTORY OFFER!

October 1-December 31, 1987

Slotted bracket provides versatile mounting of all passive devices.

Padlock hasp, or optional high security locking systems.

Factory installed hot dipped galvanized stakes, brackets and accessories assure quality control.

"TV" identification permanently molded into top hood.

Aesthetically pleasing, low profile housing provides complete 360° access working area.

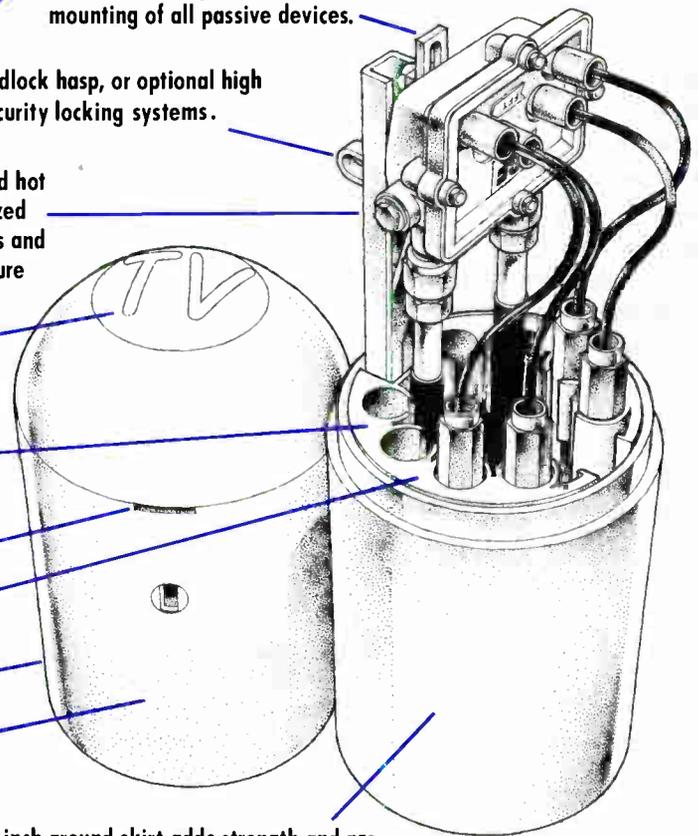
Vented to minimize condensation.

Trap holders permit all types of cylindrical traps to be mounted in pedestal.

Top of pedestal easily removed and replaced.

Constructed of high quality ABS plastic. Corrosion-proof and never needs painting. Unaffected by severe temperatures from -60°F to +160°F.

8-inch ground skirt adds strength and prevents ground erosion around the pedestal.



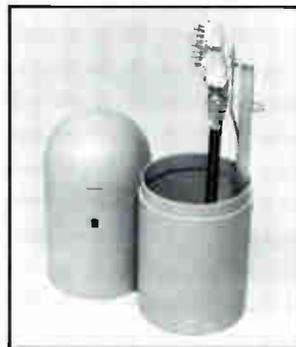
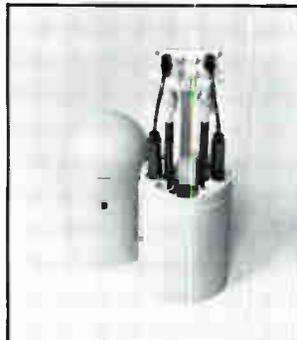
Here's your chance to purchase Channell's popular CPH-658B pedestal at a reduced price *and* try Channell's new trap holders and padlocks at special introductory prices! Channell CPH-658B pedestals are shipped 8 to a carton and there are no minimum pallet quantities. Just pick the offer that's right for you and call Channell toll free with your order:

Offer No. 1: ▶

CPH-658B pedestal with stake, hasp and bracket pre-assembled: **\$13³⁵** Regularly \$15⁷⁵

Offer No. 2: ▼

CPH-658BT pedestal with stake, hasp and bracket pre-assembled, *plus* KTH-600 cylinder trap holder: **\$15⁹⁵** Regularly \$19²⁵



Offer No. 3: ▼▶

CPH-658BLT pedestal with stake, hasp and bracket pre-assembled, *plus* CPL-125 padlock *and* KTH-600 cylinder trap holder (includes padlock key with every 8 pedestals): **\$18⁶⁰** Regularly \$23⁹⁰



Retrofit Offer:

Purchase KTH-600 trap holders and CPL-125 multiple-use padlocks at reduced prices now for retrofitting, or place them in stock for installation when needed.

KTH-600 6" Trap Holders (20 minimum): **\$2⁶⁰** ea. Regularly \$3⁵⁰

CPL-125 Padlock (includes 2 keys with every carton of 20): **\$2⁶⁵** ea. Regularly \$3⁴⁰

Offer ends December 31, 1987
Blanket orders must be shipped by January 31, 1988

CHANNELL COMMERCIAL CORPORATION

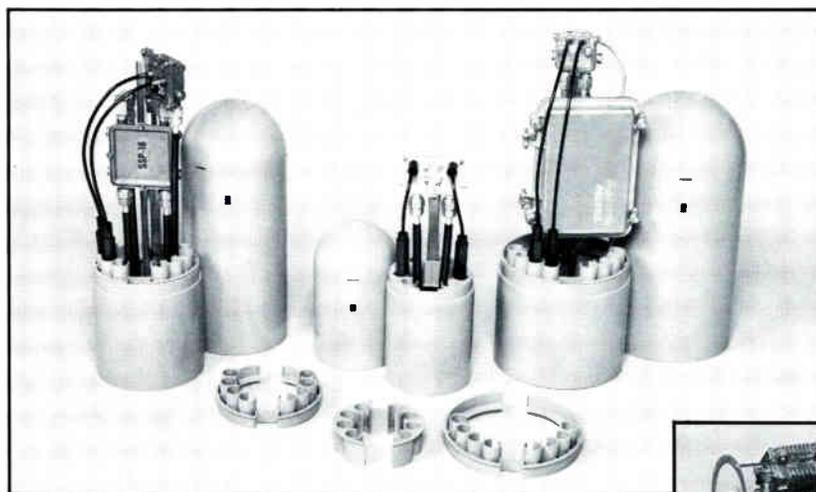
620 W. Foothill Boulevard
Glendora, CA 91740
Telex: 670-368
(818) 963-1694
(800) 423-1863
(except CA)
(800) 345-3624 (in CA)



Channell
COMMERCIAL
CORPORATION
Technology you can trust!

ENCLOSURE ACCESSORIES

C H A N N E L L



Trap Holders by Channell

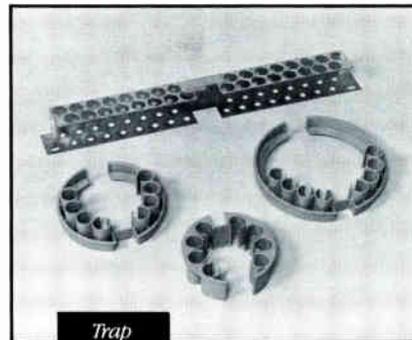
Channell's innovative new KTH Series of trap holders permit all types of cylindrical-style traps currently used in the CATV industry to be mounted in Channell pedestals. Designed to permit retrofitting of existing pedestals in the field, the trap holders can be installed into the bases of pedestals without the need to disconnect any equipment.

The trap holders eliminate the need to increase the size or diameter of the pedestal when installing traps, and their use results in trap installations which reflect good housekeeping procedures. They also prevent undue stress from being placed on the coaxial jumpers, thereby eliminating RF leakage.

Please turn the page for a special offer on Channell's KTH-600 6" trap holders. For information on 8" and 10" versions, and trap holders for Channell's low profile CPH-1230 and CPH-1730 enclosures call Channell toll free.



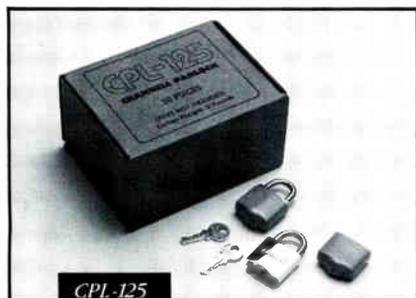
CPH-1730



Trap Holders



CPH-1230



CPL-125 Padlocks



Security Locking Devices from Channell

In addition to Inner-Tite high security barrel locks, Channell now offers high quality padlocks for hasp-design enclosures that are superior to anything

currently on the market. Manufactured exclusively for Channell, these new CPL-125 padlocks offer hardened steel/chrome plate shackles; all brass and stainless steel internal workings; "heel and toe" shackle locking; 5-mushroom pin tumbler locking mechanisms; custom keyway/key blanks; solid brass bodies; and dust caps.

See back of page
for Special Fall
Construction
Offer!

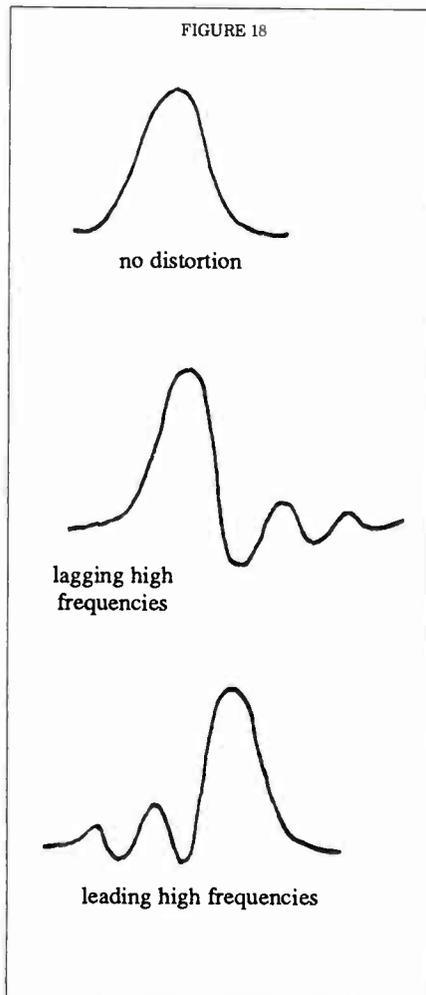
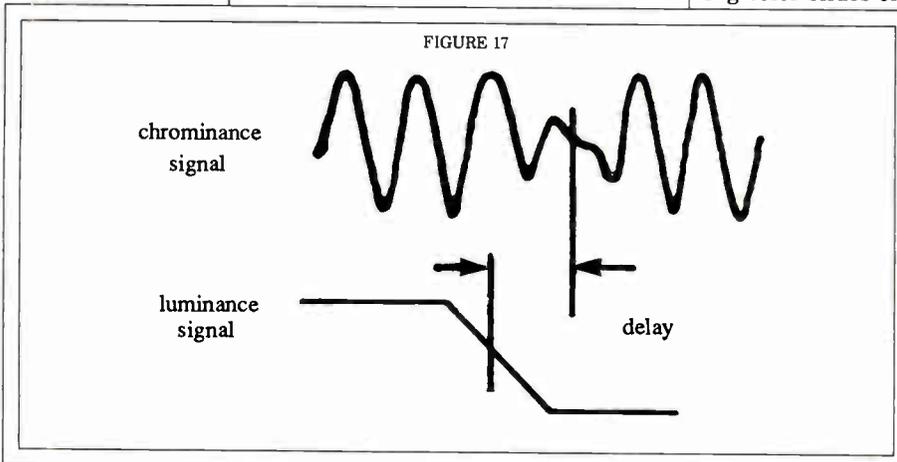
Measuring delays and their effects

This is the conclusion of the Classics article (Part I appeared in the September issue) by Fred Schulz, formerly with Sterling Communications.

It's important to keep delays as small as possible.

tance. Shift of red letters on white background are more readily visible than e.g. blue letters on white. A recent study made by Bell Laboratories, showing color slides on a video monitor to a group of trained observers, found that 100 nsec of flat delay or 180 nsec of shaped delay was just perceptible. For no objectionable impairment the figures were 260 nsec for flat delay and 480 nsec for shaped delay. Shaped delay means delay gradually rising (and falling) from the low frequencies toward the

Tektronix has introduced a way to measure chroma delay using the color bar test pattern. This method makes use of the fact that the chroma signal transition between the green and the magenta bars is easily identifiable because the phase changes 180° , and the luminance changes level as well. The delay can then be measured on a waveform oscilloscope. Luminance/chrominance crosstalk effects are also eliminated if a Tektronix generator is used, since the chrominance and luminance signals are available separately. A scope presentation can be seen in Figure 18. The 20T (or 12- $\frac{1}{2}$ T) pulse measures the "average" delay between the low luminance frequencies and the color subcarrier region. Some people have reported good agreement between 20T pulse measurements and continuous measurements with swept envelope delay equipment, others have found discrepancies. Discrepancies may possibly happen when the delay curve is very non-symmetrical about the color subcarrier. Another effect of non-symmetrical delay is color quadrature crosstalk, which results in color boundary effects. Color misregistration is also called "funny paper" effect. Opinions on how much chroma delay is tolerable vary widely in the industry. A figure of 200 nanoseconds results in a shift of the color by approximately 1/16 of an inch on a 23-inch TV set. At least one CATV manufacturer considers this tolerable. A major test equipment manufacturer feels that 250 nanoseconds yields an intolerable misregistration. A member of the Philips research laboratories considers 50 nsec chroma delay just perceptible under studio conditions. The subject matter is of great impor-



color subcarrier region. Flat delay means constant delay over the subcarrier region; color processors, which separate luminance and chrominance signals may exhibit flat delay. About the only thing everybody agrees to is that it is highly desirable to keep the delay as small as possible, since delays are additive.

Effect of delay

We already treated the special case of chroma delay. Delay effects at other frequencies result mainly in waveform distortions. We saw earlier that a waveform can be distorted by deleting higher frequency harmonics or by delays. A pulse which is representative of an actual picture waveform as produced by the scanning beam in a TV camera, and which does not contain frequency components above 4 MHz is the so-called 2T sine squared pulse. This pulse is transmitted by many TV stations as a vertical interval test signal. The pulse is 250 nsec wide at half amplitude. When envelope delay is present, the pulse gets distorted as shown in Figure 19.

A multitude of distortion patterns are possible. To judge the acceptability of a distorted pulse, a frame or window has been devised, the K-factor graticule.

If a pulse is within the outlines of a 2 percent graticule it is considered very

It is easily seen that the narrower the cross-over region is made, the sharper the cut-off rate must be.

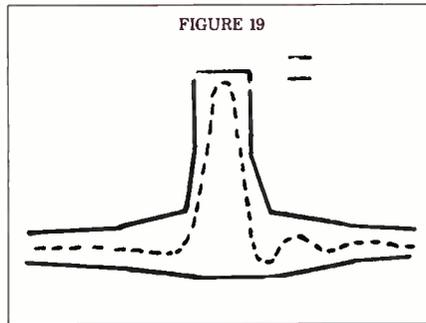
good, 4 to 6 percent is acceptable. There is no total industry agreement on the K-factor and a tie-in with actual numbers of envelope delay has not been possible. The K-factor has been treated extensively in the literature.

Two-way filters are in essence a combination of a low pass and a high pass filter with a sweep (amplitude) response as follows (both LP and HP sections shown together).

We stated earlier that sharp amplitude response changes are likely to bring delay changes with it. It is easily seen that the narrower the cross-over region is made, the sharper the cut-off rate must be. A narrow cross-over region is desired to make the sub-channel return band as wide as possible.

A compromise between usable bandwidth and tolerable envelope delay at the edge channels must be made. There is some specmanship taking place, but most manufacturers feel that 30 MHz is the highest usable sub-channel frequency. Delay effects are cumulative;

50 amplifiers with filters at the input and output result in 100 filter delays all added. If we consider 200 nsec of chroma delay tolerable, each filter cannot contribute more than 2 nsec. The designers of two-way gear are well



aware of this problem. To get more reliable measurements one tests a number of filters in cascade, commercially available delay test gear cannot resolve nanosecond delays very accurately. A fair number of systems have

used sub-channels to feed signals back to the headend by using either Blonder-Tongue model MSVM, Jerrold FCO-47 or similar filters. These filters have a very narrow cross-over region and should not be cascaded in large numbers. A B-T model MSVM was measured at 8 nsec chroma delay at channel 2.

Most of the cross-over filters are of a design with a smooth envelope delay curve so it seems that the chroma delay is a good indication of delay performance. This is not the case with sharp band-pass filters however, where the delay may vary.

Figure 22 shows amplitude and envelope delay of a sharp band-pass filter with a trap for the adjacent upper picture carrier. Figure 23 shows a band-pass filter without an adjacent channel trap. It should be noted that the amplitude response over the channel looks reasonably identical for both filters, the delay curves however, do not. The delay distortion below the

R.T.G.* VERSALIFTS - Ready for You - Right Now!

When you need a lift in a hurry, call your **Versalift** Distributor. He has fast access to our R.T.G.* pool of complete, mounted **Versalifts**. No waiting because of long delivery on vehicles, manufacturing delays, or freight problems. Best of all, they're **Versalifts**, with job-proven reliability and industry-wide acceptance. And, since we're mounting them in quantity, the

prices are right, too. Truck or van mounted, telescopic or "elbow" models, with working heights up to 55 feet, all ready to go to work — Now!

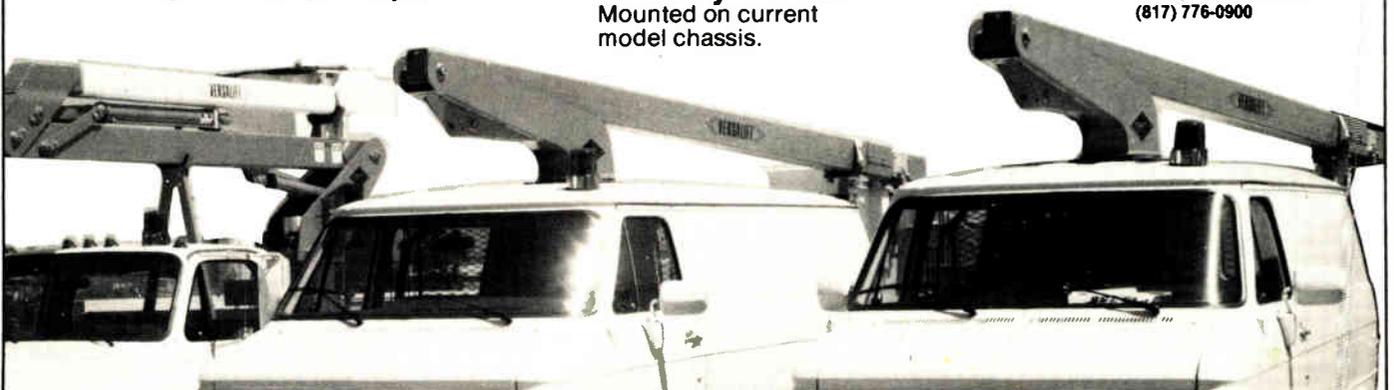


***Ready To Go**
Mounted on current model chassis.

For the name of your **Versalift** Distributor, call:

TIME
MANUFACTURING COMPANY

P.O. Box 20368
Waco, TX 76702-0368
(817) 776-0900



Micro-Beam™

The Cable Expansion Problem Solver

Innovation in Cost-Effective CARS-Band Microwave Technology



Turn your cable expansion goals into a working reality with MICRO-BEAM™, the Channel Master® CARS-band microwave relay system designed for cost-efficiency and flexibility...two important bottom line considerations in any cable expansion plan.

Both of our 1 and 5 watt systems offer you more for your investment. With MICRO-BEAM™ there are no "hidden costs" for the equipment or services you need to make your system operational. Our standard system package includes feasibility studies, equipment installation, on-site service, warranties and much more, all at no extra charge. And because MICRO-BEAM™ is basically option free, the system you order is in stock, giving you the fastest lead time of any microwave product on the market.

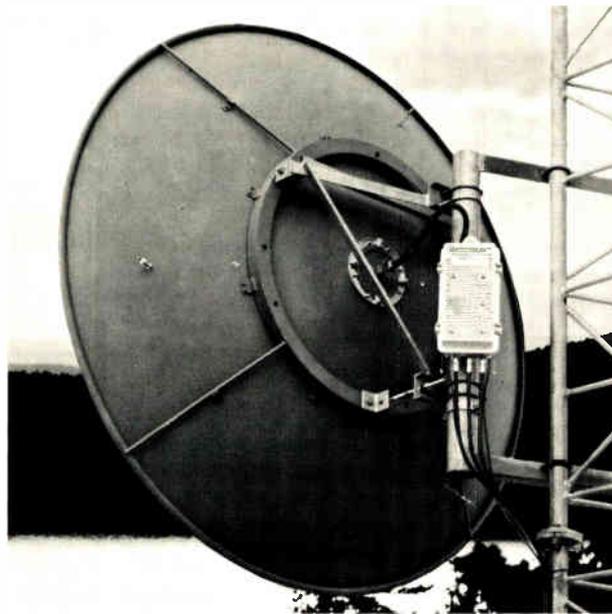
In addition, our new microwave repeater and microwave multiplier offer extra versatility and cost-savings to your MICRO-BEAM™ system by consolidating transmitter and receiver equipment, as well as allowing you to add microwave paths as needed without utilizing expensive and often excessive, tube type equipment.

Standard Equipment & Services

- 450 MHz Transmitter
- 300-450 MHz Microwave Receiver
- LNA/Image Rejection Filter/AGC
- Mounts, Waveguides, Connectors
- Feasibility Study
- Installation of MICRO-BEAM™ Electronics
- F.C.C. Application Assistance
- Alignment of Microwave Paths
- 1-Year Warranty on Parts & On-Site Service
- 24 Hour, 7-days a week, Technical and Warranty Service (In Continental U.S. Only)



That's why small cable operators, as well as some of the top MSO's like United Cable, Centel Cable, Cable Entertainment, Sonic Communications and Telescripts, use MICRO-BEAM™



as an alternative to the more expensive systems on the market today. They know that a MICRO-BEAM™ CARS-band system will put their money to work profitably.

Eliminates Additional Headends

MICRO-BEAM™ reaches isolated subscriber pockets and spans natural barriers without additional remote headends, adapting to your entire service including audio, video, data and addressability signals and commercial insertion capabilities. MICRO-BEAM™ also saves you that \$500 per-channel descrambling cost by allowing you to descramble each channel at the main headend. In fact, MICRO-BEAM™ is so compact, it allows you to transmit from a weatherproof unit that mounts behind the antenna. It can even be mounted on water towers, and can be placed anywhere in your system, not just at the headend!

Two New Microwave Products

Channel Master® has added a new microwave repeater and microwave multiplier to its line of CATV equipment products for even greater CARS-band system expansion.

The new **Repeater**, available in 1 and 5 watts, is a low noise amplifier designed to consolidate transmitter and receiver functions, allowing microwave links to be cascaded or hopped without down-converting and then up-converting the signal.

The new **Multiplier** allows the systematic addition of microwave paths to a single transmitter location without utilizing tube type equipment. Also available in 1 or 5 watts, the new multiplier is designed with adequate gain to allow full output power over a wide range of input power, allowing microwave paths to be added as needed.

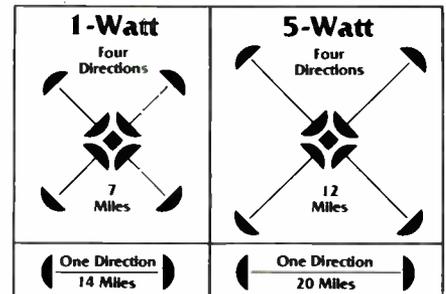
Versatility In Signal Delivery

36-Channel 300 MHz System

- 1-Watt: Transmits a fully loaded signal up to 9 miles in four directions.
- 5-Watt: Transmits a fully loaded signal up to 15 miles in four directions.

Sample Applications:

60-Channel 450 MHz System



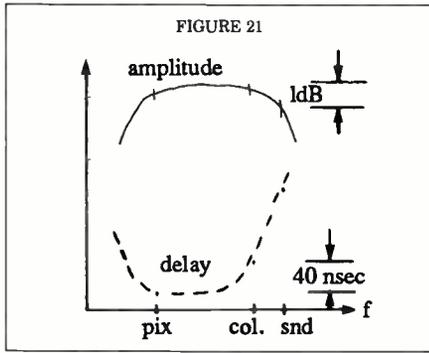
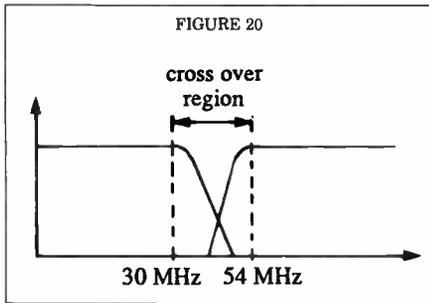
Contact us today and let our staff of qualified specialists show you how flexible and cost-efficient your cable system expansion can be, now and in the future with MICRO-BEAM™.

Contact: Jim Crowover

Channel Master®

Division of Avnet, Inc.
Industrial Park Drive, Smithfield, N.C. 27577
(919) 934-9711

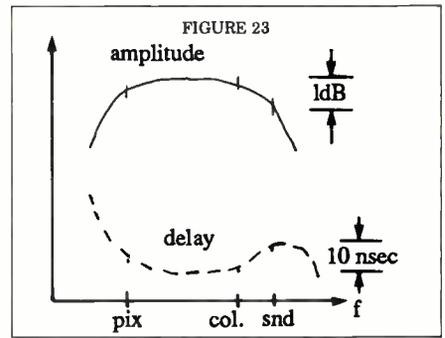
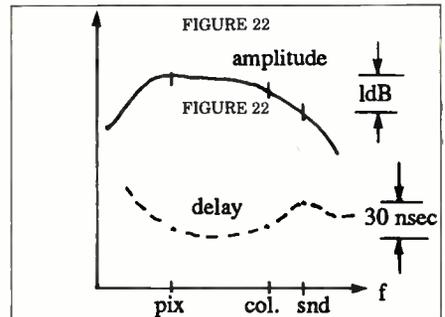
The delay distortion below the picture carrier has not received as much attention as the delay at the upper band edge.



picture carrier has not received as much attention as the delay at the upper band edge. There seems to be a new awareness of this fact and future designs will take this into account. Delay errors below the picture carrier can produce leading pre-shoot and a following slow approach to final value at sharp video transitions, resulting in a smearing effect on vertical edges.

Figure 24 shows the amplitude and delay response of a strip amplifier with less selectivity than the previous band-pass filters. Envelope delay is very small. Figure 25 shows the delay of a narrow band trap tuned for maximum signal rejection (60 dB down). Tests on this trap showed a great variation in envelope delay with very small changes in tuning. The same is true for sharp band-pass filters.

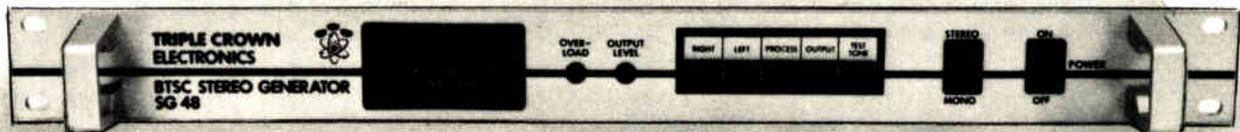
Filters with sharp cut-off have particularly bad envelope delay problems unless compensated for by using extra filter sections. Compensated filters are costlier.



BTSC STEREO GENERATOR

**FULLY DBX® COMPANDED
INTERNAL 4.5 MHz MODULATOR
DEVIATION CALIBRATION TEST TONE
EXCEEDS ALL OST60/BS15 REQUIREMENTS
LOW PROFILE 19" RACK MOUNTING**

FOR YOUR FREE COPY OF "IMPLEMENTING STEREO TV" CALL OR WRITE TODAY!



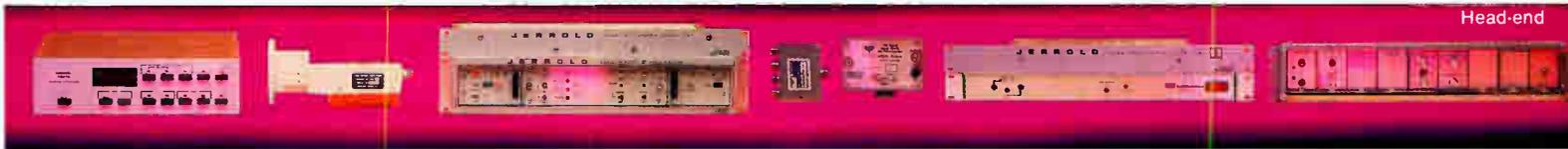
TRIPLE CROWN ELECTRONICS

4560 Fieldgate Drive,
Mississauga, Ontario L4W 3W6
(416) 629-1111
800-387-3205 (U.S. Only)

601 Fairway Drive,
Deerfield Beach, Florida 33442
(305) 429-0870
Inwats 800-824-4332

Reader Service Number 14

Satisfaction guaranteed.



We stand solidly behind every piece of cable equipment we sell.



Head-end through drop materials, it performs the way we say, or we'll correct it — immediately.



All items carry the manufacturer's full warranty.



We'll also compete with any distributor on price, selection, delivery, and service.



We stock all major brands, and can tailor packages to your needs.



Items arrive when you need them, not sooner or later.



And our engineers and technicians can answer any questions you have about design, installation, or field performance.



Call Cable Services with your next order, or for a free catalog: **1-800-233-8452.** (In PA, call 1-800-332-8545)



Cable Services Company/Inc.

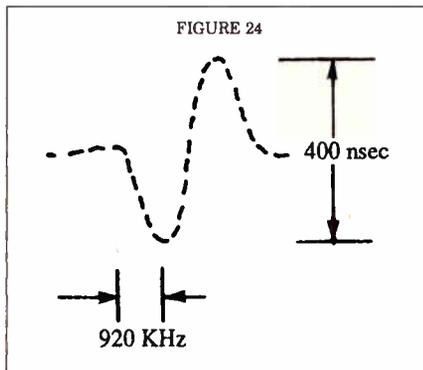
2113 Marydale Avenue, Williamsport, PA 17701

Reader Service Number 15

The response characteristic of a TV receiver is not covered by regulation nor by industry standards.

A TV set IF amplifier must be reasonably "sharp" to suppress adjacent channels, it also contains a sound trap, plus traps for the suppression of adjacent channel carriers. The IF does introduce a certain amount of envelope delay. When the currently used color system was proposed by the National Television Standards Committee in the early 1950s, it was proposed to pre-distort the transmitted signal rather than to include costly delay equalizers in every TV set.

This pre-distortion is exactly the opposite of a "typical" TV set, which has a rising delay curve from approximately 3 MHz to the upper band limit of 4.18 MHz. There were relatively few color TV sets measured to arrive at the so called "typical" receiver delay curve. The response characteristic of a TV receiver is not covered by regulation nor by industry standards. Recent measurements on a number of receivers has indicated a wide range of envelope delay curves. TV receivers are

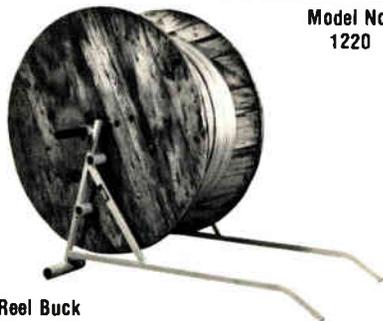


usually designed for a good compromise between selectivity, transient response, color response, cost and other factors.

A broadcaster is obliged to pre-distort the radiated signal per FCC specs. This pre-distortion is taken care of by type accepted filters and by measurements during the manufacture of the transmitter. Proof of performance measurements, made when a transmitter first goes on the air, do not require

the measurement of delay. Many broadcasters use adjustable equalizers to make up for delay deficiencies in the transmitters. Equalizers of this kind cost several thousand dollars.

All video signals fed to the transmitter are automatically pre-distorted; however, the signal may suffer delay distortion in the studio or on its way to the transmitter. There are no rules on the maximum allowable delay distortion for signals leaving the studio. It is then perfectly possible that an over-distorted signal is transmitted. Color processors used in studios often separate the luminance and chrominance signals with the possibility of introducing delay (or advance) in either luminance or chrominance. Video tape recorders can be a source of delay distortion. Many of you undoubtedly have observed delay affects only on some programs of a given channel and not on others. Efforts are currently underway by broadcasters to tighten color broadcasting standards.



Model No. 1220

Reel Buck

Collapsible for easy storage. Use on ground, truck, or warehouse. Handles strand or cable — reel diameters to 54" (.750 trunk cable).

Cable Tools

A constantly expanding selection designed for cable system maintenance and construction.

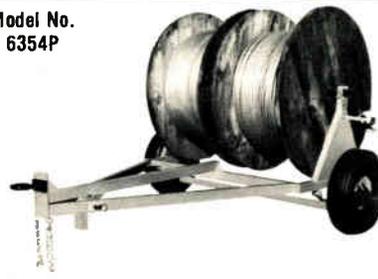
- Aerial construction
- Underground construction
- Rebuilds
- Splicing
- Installations

Available from your nearest Lemco distributor. Call or write for a complete catalog.



Lemco Tool Corporation
R.D. 2, Box 330A
Cogan Station, PA 17728
In PA: 717-494-0620
Outside PA: 1-800-233-8713
All products American-made

Model No. 6354P



Trailers

7 models available, with choice of 3 hitch types. Standard equipment includes leaf springs, light group, safety chains, license plate bracket, reflectors. Up to 4-reel capacity, or designed to your specs.

NEW



Coring/Stripping Tool

Exclusive "Corstrip" features:

- adjustable center conductor stop
- tapered stripping blade creates smooth, clean chamfer to outer conductor ends. No burrs or sharp edges; clamp nuts slide on easily
- for use with Dielectric, MC², and Cableflex, in all cable sizes

Model No. XA-85



Quick-Change Adapter

Put this on your 3/8" or larger drill chuck and go from one Corstrip tool diameter to another — in seconds.

Model No. T-254



Cable Caddies

...can be carried to walk off cable, or stationary for cable pull-out. 3 models available to handle all size drop cable reels.

Announcing **Lindsay**

**Celebrates...
30 Years** of service to the
CABLE TELEVISION Industry

Your full line, state-of-the-art
CATV Manufacturer.

Lindsay Synonymous
with **SERVICE**
and **RELIABILITY**

ANTENNAS, TRUNK BRIDGERS, LINE EXTENDERS
LINE PASSIVES, APARTMENT AMPLIFIERS - 450, 500, 550 MHz.

Get on the **Winning Side ...**
Join the **Lindsay**

**LINDSAY SPECIALTY
PRODUCTS LIMITED**

50 Mary Street,
Lindsay, Ontario,
Canada, K9V 4S7
Tel: (705) 324-2196

CO:	ADVANCED COMM.	303-596-4464
FL:	O.W. LINDBURG	813-371-3444
NY:	ANIXTER-TELEWIRE	800-645-9510
OH:	THE HEAD END CO.	614-766-0874
PA:	JIM MORTON & ASSOC.	717-243-4653
PA:	TONER CABLE EQUIP.	215-675-2053

It may be of interest to realize that some TV studio specifications call for +25 nsec envelope delay.

Envelope delay in FM equipment

FM receivers should have linear phase response (no envelope delay) otherwise FM signals are distorted. Some recently introduced FM gear paid particular attention to delay response in the IF amplifier with resulting superior performance, such as low harmonics and intermodulation. The achieved performance would probably

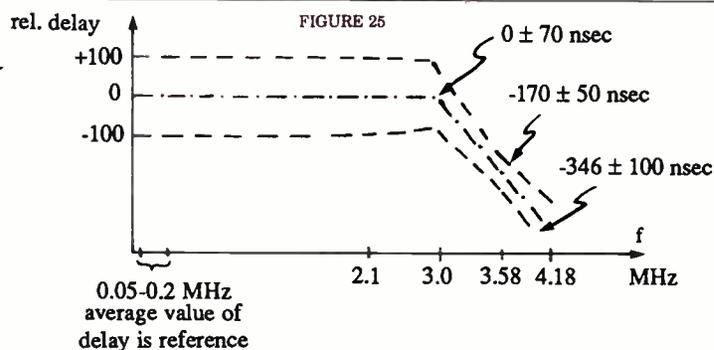
of gear is considered since it is recognized that not every CATV operator will be able to purchase envelope delay measuring gear.

It is my opinion that it is only a matter of time before the FCC will take a similar stand.

Manufacturers will probably be required in the future to certify modulators, demodulators and signal processing equipment at envelope delay and

Bibliography

1. Radio Engineers handbook, Terman.
2. Television Engineering Handbook, D. Fink
3. *Television Systems Measurements*, Tektronix 062-1064-00; 1969.
4. *Rhode & Schwarz*; instruction book model LFM envelope delay set.
5. *Datatek*; instruction book model D-700 envelope delay set.
6. 1969 NCTA Convention transcript.
7. 1970 NCTA Convention transcript.
8. Proceedings of the IEEE, July 1970; issue on cable TV.
9. Color Television, selections from the Journal of the SMPTE; 1970.
10. *Subjective Effects of Delay Difference Between Luminance and Chrominance Information of the NTSC Color TV Signal*; A. Lessman, Bell Tel, Holmdel; SMPTE meeting, Los Angeles, April 1971.
11. *Envelope delay in CATV systems*; G. Rogeness TV Communications, October 1965.
12. Television Signal Analysis; AT&T Long Lines dept.
13. *Envelope Delay—the Misunderstood Phenomena of TV Systems*; Archer Taylor; IEEE Convention, March 1971.
14. *Measuring Envelope Delay in Communication Circuits for Digital Data Links*; E. Thompson; Electronic Instrument Digest, July 1968.
15. *Correlation between TV Transmitter Performance Measurement and Picture Quality*; T. Gluyas and W. Behrend; IEEE, BC-14, March 1968.
16. *Chrominance to Luminance Ratio and Timing Measurement in Color Television*; C.A. Siocos; IEEE, Vol. BC-14, March 1968.
17. *Performance Comparison of TV Transmitter RF Demodulators and the Home Receiver*; W. Behrend; IEEE, Vol. BC-17, March 1971.
18. *Measurement of Receiver Phase Characteristics*; W. Hand; IEEE, T-BTR 70, Nov.
19. *Phase Shift Consideration in TV Broadcasting*; M.W. Davies, Datatek.
20. *A New Low Distortion FM Tuner*; IEEE, T-BTR 70, Nov.
21. Hewlett-Packard, Application notes AN77-4 and 91.
22. Proceedings of the IRE, Jan. 1954.



be noted by the real hi-fi bug, but not by the average listener. Present FM headend gear is designed along more conventional lines with typical hi-fi gear performance.

It was pointed out earlier that delay distortion and rapid amplitude changes such as those found in single channel equipment go hand in hand. A CATV plant is wide band and accordingly has little envelope delay. Jerrold showed the delay curve of an 18 amplifier cascade (see Figure 27).

Hewlett-Packard in its application note #92 shows the delay of a single CATV amplifier as 2 nsec from 54 to 120 MHz, and within 1 nsec from 120 MHz to 216 MHz.

Regulations

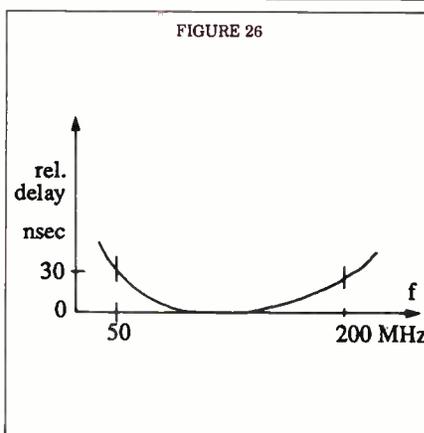
The proposed technical standards for CATV do not mention envelope delay specifically. The standards clearly indicate that the FCC wants the CATV system to faithfully reproduce the received signals at the subscriber's set.

The recently enacted Canadian standards require local origination signals to be pre-distorted per DOC (Canadian equivalent of the FCC) specs and that headend processors must retain the original pre-distortion. Type approval

other types of distortion.

It may be of interest to realize that some TV studio specifications call for +25 nsec envelope delay.

An attempt has been made to explain "delays." It should be understood that delays can cause but one of the many distortions a signal can suffer from scene to TV set. For single



channel equipment envelope delay measurements are a necessary complement to the more familiar amplitude response. Both amplitude and delay responses must be performed under all encountered signal level conditions. ■

HOW TO TAKE THE RECALL OUT OF THE INSTALL



Belden's drop cable with DUOBOND PLUS™ shield helps you prevent costly call-backs. It's also the most shield-effective drop cable in the CATV industry.

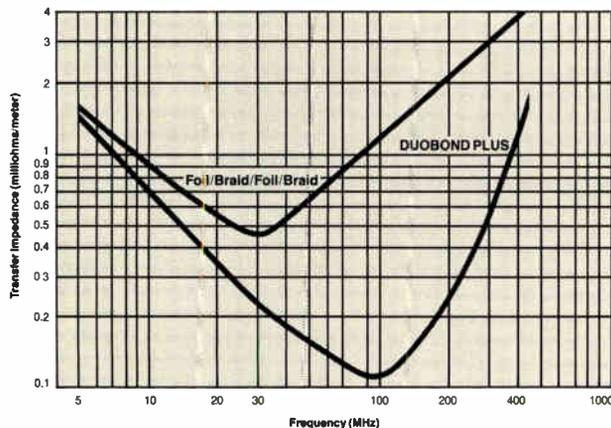
Easier termination for maximum shielding integrity.

The DUOBOND PLUS shield features a foil/braid/foil construction with a shorting fold in the outermost foil which provides superior shielding effectiveness to typical 4-layer shield constructions. The transfer impedance graph demonstrates this effectiveness.

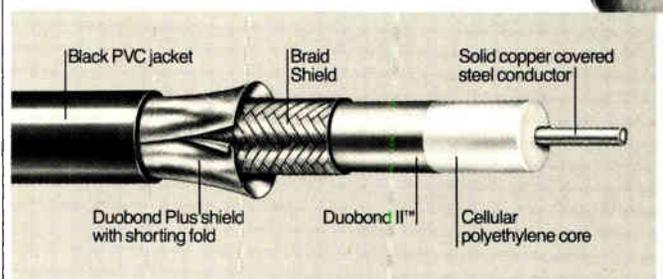
The added benefit is easier termination. This means less chance for error, resulting in greater shielding integrity and reliability. It also means fewer

call-backs, lower operating expenses and more satisfied subscribers.

Cables with the DUOBOND PLUS shield require only half the steps for termination than 4-shield cables. Because it's less bulky, more flexible and its outer foil is bonded to the jacket, stripping and connectorizing are much simpler tasks. You can minimize your connector inventory to one size connector and one crimp tool.



Belden's unique shield protection.



The inner foil of the DUOBOND PLUS shield is bonded *directly* to the core. Foil pushback and signal leakage problems are eliminated. Protection from shielding degradation is eliminated during installation—where most shielding problems occur.

The unique shorting fold in the outer foil of the DUOBOND PLUS shield provides metal-to-metal contact for improved isolation. Traditional overlapping foils fail to reduce slot radiation as effectively.



Belden's exclusive shorting fold

Drop cables with the DUOBOND PLUS shield are available in RG59, RG6 and RG11 constructions—messengered, non-messengered, dual and flooded versions. All cables are 100% sweep tested from 5 to 450 MHz with a minimum return loss of 23db for RG59 and 26db for RG6.

When it comes to shielding effectiveness and ease of termination, *There is no equal* to Belden in the CATV industry. Take the recall out of your install. Call Belden today for more information and a free CATV catalog. Belden Wire and Cable, P.O. Box 1980, Richmond, IN 47375. **1-800-BELDEN-4**

There is no equal.™



Has fiber's day finally arrived?

When will the cable industry embrace fiber optic cable for more than just supertrunking applications? Can a fiber system be cost justified? When will fiber be brought to the home? Those questions, and others, have been posed to leaders of the industry for several years, without much positive response. But, at last, one MSO has grander plans for the technology.

Technical sessions on fiber and its applications were provided by the SCTE during the annual Missouri Cable Television Association convention, held at the Lodge of the Four Seasons resort in Lake Ozark recently.

During one session, it was learned that American Television and Communications is actively researching the feasibility of constructing all-fiber "backbones" in its large urban systems in order to substantially reduce the length of amplifier cascades. According to David Pangrac, director of engineering technologies at ATC and the project's manager, the backbone concept could offer improved signal quality and cost improvements through a reduction in maintenance efforts.

While many in the industry continue to downplay fiber's immediate importance, ATC, under the leadership of Pangrac and Vice President of Engineering and Technology Jim Chiddix, believes fiber technology is evolving rapidly enough that the backbone system could be in place within the next two years, according to Pangrac.

Essentially, the fiber backbone system consists of a number of fiber strands emanating from the headend to fiber nodes, or distribution points, located in various neighborhoods throughout the system (at roughly every other power supply). Because systems exist today that allow fiber to carry light-wave signals as far as 30 kilometers without being amplified, clean, strong

ATC surges ahead with fiber optic plans.

signals can be delivered to each node without degradation. From that point, the signals are converted back to RF and distributed via traditional coaxial feeder and drop cable.

in its national laboratory in Denver. According to Pangrac, the bottleneck holding up deployment of the system is development of an affordable analog laser technology. Nevertheless, a working prototype of the system may be developed as early as the end of this year, said Pangrac.

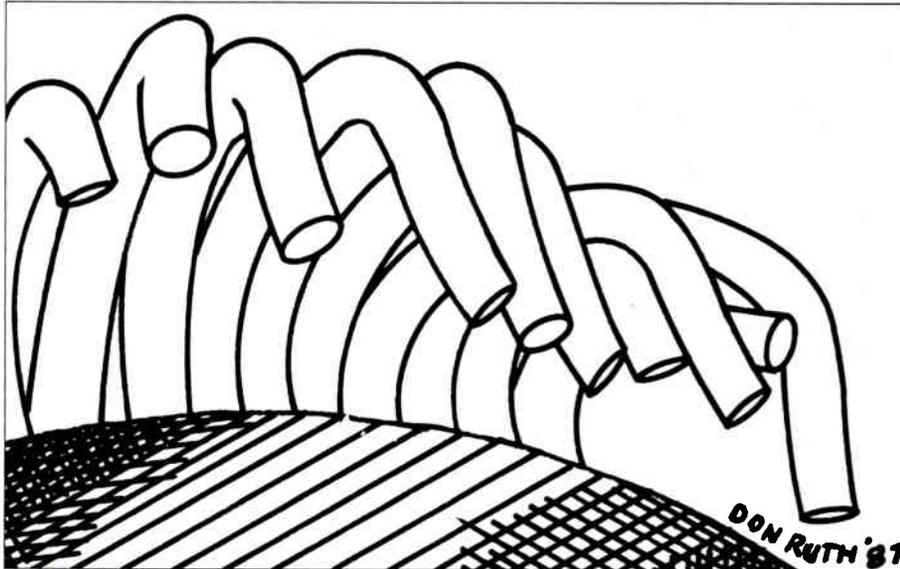
ATC is looking at being able to deploy the fiber backbone for about \$27 per subscriber, an investment cable operators can make back within 18 months through reduced maintenance costs, said Pangrac. Because there are so few amplifiers in cascade and no trunk amps, the time and resources usually spent sweeping those trunk amps can be eliminated or reallocated.

In anticipation of the project's development, ATC has put a hold on complete rebuilds except in those areas where old coaxial cable cannot handle additional bandwidth. Instead, the MSO is upgrading its systems by dropping in amplifier modules to offer more bandwidth or installing new connectors.

Operationally, the number-two MSO says the technology must deliver 42 channels of video to each node, with the farthest node being about 15 kilometers from the headend. So far, 36 channels have been carried over a single fiber in the company's lab, but picture quality is not up to par, yet. But, as an example of how quickly the testing is progressing, Pangrac predicted the system would squeeze out the full 42 channels by the time this article reaches the press.

If ATC gets its fiber backbone plan off the ground and working, the next step is to take the technology all the way to the home. Although that development is still years away, technological advances have brought the day ever closer. "Our goal is to try to do it within five years," said Pangrac.

—Roger Brown

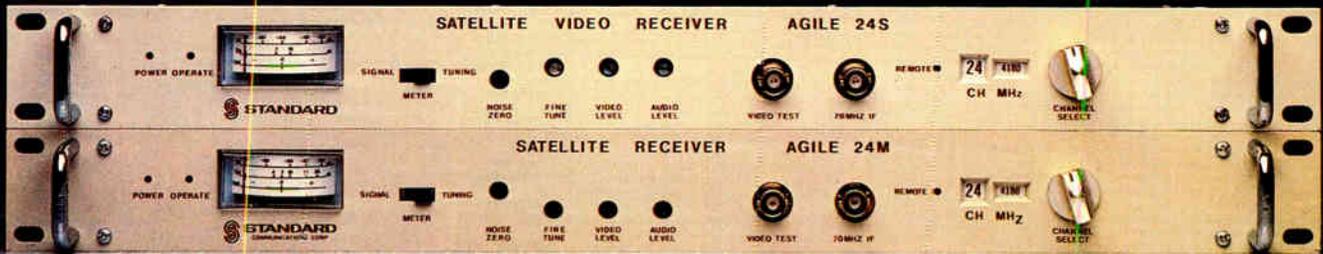


The backbone concept was borne out of a concern that today's systems have simply become so sprawling and complex that the potential for a catastrophic outage "is really quite high," said Pangrac. For instance, ATC's Kansas City system (upon which the fiber model has been based) consists of nearly 3,000 miles of plant, 23 headends, 498 power supplies, 16 million feet of cable, a million F connectors, 12,000 line extenders and suffers temperature swings between -22° and -105° F.

"In systems like this it is not unusual to have outages that effect literally thousands of people at one time," said Pangrac.

Under the fiber scenario, outages could still occur, but would affect hundreds of subscribers, not thousands, thereby reducing the load of telephone calls and providing subscribers with more perceived value. A huge system like Kansas City would actually become a series of independent, four-amp operating systems.

ATC is presently testing the concept



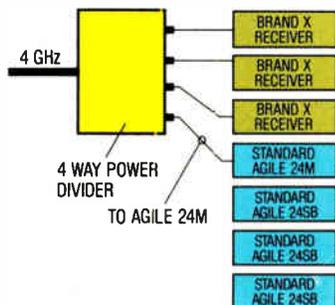
GROWING BIGGER SHOULDN'T MAKE YOUR SIGNAL GROW WEAKER

With Standard's Agile 24 receivers' loop-thru IF circuitry, upgrading your system doesn't have to mean degrading your signal, blowing your budget, or accumulating lots of downtime.

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

All you need is a one-port jumper from your splitter to our Agile 24M master receiver.

Our loop-thru feature lets you drive up to 12 Agile 24SB slave units from the master **without expensive power dividers, and without losing signal strength.**



Our most relied-upon receiver

Known industry-wide for dependable operation, the Agile 24M is a dual-conversion 4 GHz receiver that

block downconverts to 760-1260 MHz.

Its active loop-thru design supplies the entire 500 MHz wide block of frequencies to Agile 24SBs.

The Agile 24M's phase-locked loop synthesizer and effective AFC circuit combines with a temperature-stabilized dielectric resonator oscillator (DRO) to ensure rock stable operation. In areas where microwave interference is a problem, optional 60 MHz and 80 MHz filters can be easily installed.

Simple installation, testing and maintenance

The Agile 24 M/SB Series features a low-profile 1³/₄" chassis that occupies a single rack space. The front panel includes a three function meter that displays signal strength, C/N, and center tune; as well as convenient test connections and performance adjustment controls. It is Video-Cipher II™ tested and approved for all programs being scrambled.

Backed with the industry's strongest warranty/replacement program

Our satellite receivers are built to last, and our warranty program shows it.

If a unit fails, call us and an immediate replacement will be shipped within 24 hours.

If it's within our one-year warranty, the replacement is free. Within years two through five, the replacement is only \$100.

For more information on improving your system, and on the full line of Standard Communications TVRO products, call us toll free at 800/243-1357 (in Calif. call direct, 213/532-5300, ext. 275), or mail in the coupon below.



Standard
Communications

SATCOM Division
P.O. Box 92151
Los Angeles, CA 90009-2151

Engineered to a new standard

I'm planning to add satellite channels

Please send me a detailed brochure

Have a sales representative call

Name _____

Title _____

Company _____

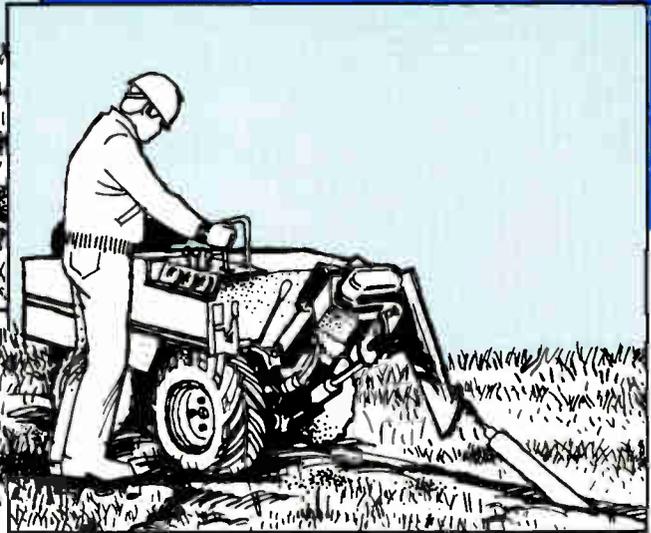
Phone _____

Street _____

City _____ State _____ Zip _____

SEND FOR
FREE SAMPLE!

How much does it cost to go back?



Cablecon® drop- in-conduit... Figure the *reel* cost!

Cablecon drop-in-conduit can save you a lot of headaches ... and dollars. And, it makes a lot of sense.

Labor is a major cost for any installation, and if you're direct burying your drop cable, it could end up costing you a bundle. While nobody knows just how long direct buried drops will last in the ground, Cablecon drop-in-conduit can greatly extend your drop cable life expectancy. And if you do have to go back to re-pull or repair a damaged drop, it's easy to install.

If you're hand trenching, pulling in lateral street cut applications, or using a vibratory plow, why

not put Cablecon in now? It's good insurance against going back later ... especially if your drops start going bad, or your subscribers decide to become weekend gardeners.

For complete information on drop-in-conduit, cable-in-conduit, empty duct with pull-string pre-installed, or prelubricated conduit, contact Integral Corporation or Channell. Direct sales representatives and distribution facilities are located throughout North America.

- Dallas
- Baltimore
- Tampa
- Los Angeles
- Toronto

Marketed exclusively by
Channell Commercial Corporation
(818) 963-1694
(800) 423-1863
(except CA)
(800) 345-3624
(in CA)

3/4" with
RG service
wire

1/2" with
RG service
wire

10mm
with
RG service
wire



Integral Corporation

1424 Barry Avenue, Dallas, TX 75223
(214) 826-0590 • (800) 527-2168 except TX

CEC

1987

CATV

Buyers' Guide

CATV Index

Accessories—

Sealants/Markers/Clips/Tags

AVCOM of Virginia, Inc.
Adapt Comm.
B E & K Comm., Inc.
Baltimore Cable
Budco Inc.
CATV Services, Inc.
CRI/Cable Resources Inc.
CWY Electronics
CZ Labs
Cable Call Corp.
Cable Services Co., Inc.
Cable TEK Center
Channell Commercial Corp.
Fastex
General Sealants, Inc.
Holbury Precision Plastics
Interstate Cable Enterprises Inc.
Jerry Conn Assoc., Inc.
Marmax Sales
Midwest Sales
Midwest CATV
Multilink
North Supply Co.
Passive Devices, Inc.
Pitts, T.R. Co.
Power & Telephone Supply Co. Inc.
Qintar, Inc.
RMS Electronics
RMT Engineering, Inc.
Raychem CATV
Sachs Comm., Inc.
Starvision Sales
Tapecoat Co.
Universal Electronics, Inc.
Weeks, John Enterprises
Weldone Trading Co., Inc.
Western CATV Distributors, Inc.
White Radio, Ltd.
dB Comm., Inc.

Amplifiers/Amplifier Modules

Adapt Comm.

Amperex Electronic Corp.
Anixter-Tele-Wire
Augat/Broadband
Avantek, Inc.
B E & K Comm., Inc.
BK Labs, Inc.
Blonder-Tongue Laboratories Inc.
Brad Cable
Broadband Engineering, Inc.
C-COR Electronics, Inc.
CATV Services Co., Inc.
COM-TEK
CWY Electronics
CZ Labs
Cable Call Corp.
Cable Link, Inc.
Cable Services Co., Inc.
California Amplifier
Channellmatic, Inc.
Colormax Electronic Corp.
ComSE Sales Corp.
Comlink Systems, Inc.
Donley International, Inc.
Electroline TV Equipment, Inc.
Electrotex
Gamco Industries
Global Systems Corp.
Incospec Electronics
Jerrold/General Instrument
Jerry Conn Assoc., Inc.
LNR Comm., Inc.
Lindsay Speciality
Magnavox CATV Systems, Inc.
Marmax Sales
Mega Hertz Sales
Midwest CATV
NCS Industries, Inc.
OEM Sales
PICO MACOM
Passive Devices, Inc.
Pico Products, Inc.
Pitts, T.R. Co.
Power & Telephone Supply Co. Inc.
Q-Bit Corp.
Qintar, Inc.
Quality RF Services, Inc.
RFI Comm., Inc.

RMT Engineering, Inc.
Rosstek Comm. Ltd.
Scala Electronic Corp.
Sigmacom
Starvision Sales
System Services Cable
Tele-Spectrum, Inc.
Temtron Electronics Ltd.
Texscan Corp.
The Headend
Toner Cable Equipment Co.
Triple Crown Electronics, Inc.
U S Television Systems, Inc.
U.S. Cable Inc.
United Satellite Systems
Viewsonics, Inc.
Washington Cable Supply, Inc.
Weeks, John Enterprises
Western CATV Distributors, Inc.
White Radio Ltd.
dB Comm., Inc.

Antennas (Off-Air)

American Earthstations, Inc.
Anixter-Tele-Wire
B E & K Comm., Inc.
Blonder-Tongue Laboratories Inc.
Bogner Broadcast
CADCO, Inc.
CATEL Telecomm.
CWY Electronics
Cable Services Co., Inc.
Channel Master
Comlink Systems, Inc.
Diamond Comm.
Donley International, Inc.
Electrotex
Incospec Electronics
Interstate Cable Enterprises Inc.
Lance Industries
Lindsay Speciality
Marmax Sales
Mastercom
Mega Hertz Sales
Midwest CATV
NCS Industries, Inc.
Pitts, T.R. Co.

Power & Telephone Supply Co. Inc.
RMT Engineering, Inc.
Scala Electronic Corp.
Sigmacom
Simplicity Tool Co., Sitco Antennas
Starvision Sales
System Services Cable
Temtron Electronics Ltd.
Texscan Corp.
The Headend
Toner Cable Equipment Co.
U S Television Systems, Inc.
Weeks, John Enterprises
Western CATV Distributors, Inc.
Western Towers

Antennas (Satellite) (ICA)

American Earthstations, Inc.
Andrew Antenna Co. Ltd.
Anixter-Tele-Wire
Antenna Technology Corp.
B E & K Comm., Inc.
Blonder-Tongue Laboratories Inc.
COM-TEK
CWY Electronics
Cable Services Co., Inc.
Channel Master
Comlink Systems Inc.
Comsat Technical Services
Comtech Antenna Div.
Diamond Comm.
Donley International Inc.
Electrotex
Global Systems Corp.
Incospec Electronics
Interstate Cable Enterprises Inc.
Jerry Conn Assoc., Inc.
Lance Industries
Lindsay Speciality
M/A-COM Telecomm.
Mark Antenna Products Inc.
Marmax Sales
McCullough Satellite
Mega Hertz Sales
Microdyne Corp.
Midwest CATV

NCS Industries Inc.
 Norman Weinhouse Assoc.
 Omega Satellite
 Orbitron
 PICO MACOM
 Pico Products Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co.
 RMT Engineering Inc.
 Rainbow Satellite Comm.
 Rosstek Comm. Ltd.
 Satcom Technologies Inc.
 Sigmacom
 Stark & Assoc.
 Starvision Sales
 System Services Cable
 The Headend
 Toner Cable Equipment Co.
 U S Television Systems Inc.
 United Satellite Systems
 Western CATV Distributors, Inc.

Batteries

Adapt Comm.
 Advance Telecom
 Alpha Technologies
 American Marketing
 Anixter-Tele-Wire
 BK Labs, Inc.
 Baltimore Cable Supply Inc.
 CWY Electronics
 Cable Security Systems Inc.
 Comlink Systems Inc.
 Electrotech
 GNB Incorporated
 Greater Distributing Services Inc.
 Interstate Cable Enterprises Inc.
 Johnson Controls Inc.
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 NCS Industries Inc.
 North Supply Co.
 Pitts, T.R. Co.
 R. Alan Comm., Inc.
 RMS Electronics
 RMT Engineering Inc.
 Temtron Electronics Ltd.
 Viewsonics Inc.
 Washington Cable Supply, Inc.
 Western CATV Distributors, Inc.
 dB Comm., Inc.

Cable

ABM Sales Inc.
 Adapt Comm.
 Andrew Antenna Co. Ltd.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 Baltimore Cable Supply Inc.
 Belden Wire and Cable
 Burnup & Sims
 CATV Service Co. Inc.
 Cablec Corp.
 Capscan Cable Co.
 Channel Master
 Channell Commercial Corp.
 Comm/Scope/General Instrument
 Consolidated Electronic
 Daburn Electronics
 Donley International Inc.
 Electrotech
 Facile Technologies Inc.
 Fastex
 Gabriel Electronics Inc.
 Gilbert Eng. Co. Inc.
 Holbury Precision Plastics
 Integral Corp.
 Intern'l Electronic
 Interstate Cable Enterprises Inc.
 Jacobs Trenching Mfg.
 Jerry Conn Assoc., Inc.
 Mark Antenna Products Inc.
 Marmax Sales
 Mastercom
 McCullough Satellite
 Mega Hertz Sales
 Midland Metals Corp.
 Midwest CATV
 North Supply Co.
 OEM Sales
 PICO MACOM
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Quintar Inc.
 RFI Comm., Inc.

RMS Electronics
 RMT Engineering Inc.
 Siecor Corp.
 Sigmacom
 Southwire Co.
 Starvision Sales
 Systems Services Cable
 Tamaqua Cable Products Corp.
 The Headend
 Times Fiber Comm. Inc.
 Toner Cable Equipment Co.
 Trilogy Comm.
 U S Television Systems Inc.
 WEMCO
 Washington Cable Supply Inc.
 Weeks, John Enterprises
 Western CATV Distributors Inc.
 White Radio Ltd.
 dB Comm. Inc.

Character Generators

A.F. Assoc.
 Anixter-Tele-Wire
 B E & K Comm., Inc.
 COM-TEK
 CWY Electronics
 CZ Labs
 Cable Services Co. Inc.
 Channelmatic Inc.
 Chyron Corp.
 D.E.L. Compu-Cable
 Donley International Inc.
 Incospec Electronics
 Interstate Cable Enterprises Inc.
 Jerry Conn Assoc., Inc.
 Knox Video
 Mega Hertz Sales
 Midwest Comm. Corp.
 Mycro-Tek
 PICO MACOM
 Phoenix Cable/Lease
 Pitts, T.R. Co.
 R. Alan Comm., Inc.
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 SRP Electronics, Inc.
 Starvision Sales
 Tele-Engineering
 Teledac Inc.
 Texscan Corp.
 The Headend
 Toner Cable Equipment Co.
 U S Television Systems Inc.
 Video Data Systems
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 dB Comm., Inc.

Commercial Insertion Equipment

A.F. Assoc.
 Abiqua International
 Adams-Russell Co. Inc.
 Anixter-Tele-Wire
 Cable Services Co. Inc.
 Channelmatic Inc.
 ComSE Sales Corp.
 Comlink Systems Inc.
 Commercial Cable Inc. (CCI)
 H A Solutec Ltd.
 Jerry Conn Assoc., Inc.
 La Kart Corp.
 Mega Hertz Sales
 Monroe Electronics Inc.
 Peirce-Phelps Inc.
 Phoenix Cable/Lease
 Pitts, T.R. Co.
 R. Alan Comm., Inc.
 RMT Engineering Inc.
 Strata Comm. Industries Inc.
 Tele-Engineering
 Telecomm. Products
 Texscan Corp.
 Toner Cable Equipment Co.
 U S Television Systems Inc.
 Video Data Systems
 Video Tape Systems Inc.
 Weeks, John Enterprises
 Western CATV Distributors Inc.
 dB Comm., Inc.

Construction Contractors

AM Comm. Inc.
 Abcon Assoc. Inc.
 Adderley Ind. Inc.
 American Cable Constructors
 American Earthstations, Inc.

American Utility Construction Inc.
 Avtec Industries Inc.
 B-Line Construction
 Barker CATV Construction Inc.
 Bose Assoc. Inc.
 Bycom Corp.
 C & S Construction Inc.
 CATV Subscriber Services, Inc.
 CZ Labs
 Cable Comm. Construction Inc.
 Cable Consultants Inc.
 Cable Services Co. Inc.
 Cable TV Contracting
 Cablemasters Corp.
 Cablevision Services Inc.
 Carpenter's Cable Construction
 Cavision Comm.
 Cecon, Inc.
 ClearVision Cable Constructors, Inc.
 Clover Cable Systems
 Coaxial Construction Corp.
 Cochran Comm. Construction
 Cra-Mac Cable Services, Inc.
 D.E. Gerrity Assoc. CATV Services
 Early & Sons, Inc.
 English Enterprises
 Excalibur Cable Comm. Ltd.
 G & L General Contractors, Inc.
 Henkels & McCoy Inc.
 Interstate Dropline Installers Inc.
 Irwin Industries Inc.
 Jacobs Trenching Mfg.
 Knight Construction Co.
 Lakeshore Cable Contractors, Inc.
 Lightning Electric of PA Inc.
 Lowe's Construction Co.
 Microflex Co., Inc.
 Mucip Cable TV Services
 Nacom Construction Corp.
 Omega Satellite Services Inc.
 Overland Cable
 Pearl, J.C. Ltd.
 Professional Line Construction
 Pyramid Cable Services Inc.
 Quality Cable Underground
 R & L Cable Installation
 RFI Comm., Inc.
 Ross Comm., Inc.
 S.B.M. Comm.
 SDI Services Inc.
 SJC Cable Splicers Inc.
 Satellite Cable Specialists
 Schenck Construction
 Sigmacom
 Sir Enterprises
 Southeast Cable Construction Corp.
 Southland Underground
 Stark & Assoc.
 Superior Cablevision Installers Inc.
 System Services Cable
 Technetronics Inc.
 U S Television Systems Inc.
 U.S. Cable Inc.
 Underground Piercing Inc.
 United Satellite Systems
 Walton Towers Inc.
 Western CATV Distributors, Inc.
 Williams, L.W. Contractor Inc.

Construction Materials

A.B. Chance Co.
 Aberdeen Co.
 Adapt Comm. Supply Co. Inc.
 Allen Systems Inc.
 Allied Steel & Tractor Products Inc.
 American Marketing Systems Inc.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 CWY Electronics
 Cable Link, Inc.
 Cable Security Systems Inc.
 Cable Services Co. Inc.
 Cable Tek Center
 Carolina Galvanizing Corp.
 Diamond Comm.
 Diversified Control Systems
 General Machine Products Co. Inc.
 Integral Corp.
 Interstate Cable Enterprises Inc.
 Jerry Conn Assoc., Inc.
 Joslyn Corp.
 Klein Tools, Inc.
 LRC Electronics Inc.
 Lemco Tool Corp.
 McGraw-Edison Power System
 Midwest CATV

Omega Satellite Services Inc.
 PolyPhaser Corp.
 Power & Telephone Supply Co. Inc.
 Preformed Line
 Quintar Inc.
 RFI Comm., Inc.
 Sachs Comm. Inc.
 Starvision Sales
 Stelco Inc.
 Superior Metal Products Inc.
 Supra Key Control Ltd.
 Technetronics Inc.
 U S Television Systems Inc.
 U.S. Cable Inc.
 UEC SKYVAN
 Vibra-King Inc.
 Weldone Trading Co. Inc.

Converters/Addressable Converters/ Non-Addressable Converters

Anixter-Tele-Wire
 Authorized Parts Co.
 BK Labs, Inc.
 Baltimore Cable Supply Inc.
 Brad Cable Electronics Inc.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 Cable Call Corp.
 Cable Exchange Inc.
 Cable Link, Inc.
 Cable Services Co. Inc.
 Cabledenna Corp.
 Colormax Electronic Corp.
 Comlink Systems Inc.
 Compu-Trace Inc.
 Contract Installers Inc.
 Digitrace Inc.
 ECTV Inc.
 EPD Electronics Inc.
 General Electric Co.
 Global Systems Corp.
 Intercept Corp.
 Interstate Cable Enterprises Inc.
 Island Cable Electronics
 Jerrold/General Instrument
 Kanematsu-Gosho (USA) Inc./Sprucer
 LNR Comm., Inc.
 MLE/Main Line Equipment Co.
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 Midwest Comm. Corp.
 NSC Electronics
 Oak Comm., Inc.
 PICO MACOM
 PTS/KATEK
 Passive Devices, Inc.
 Phoenix Cable/Lease
 Pioneer Comm.
 Pitts, T.R. Co.
 Quintar Inc.
 RF Analysts Inc.
 Rosstek Comm. Ltd.
 SIG Enterprises Inc.
 Sprucer CATV Group
 TOCOM/General Instrument
 Tektronix Inc.
 Temtron Electronics Ltd.
 The Headend
 U S Television Systems Inc.
 Washington Cable Supply Inc.
 White Radio Ltd.
 White Sands Jumper Cables
 Zenith Cable Products Div.
 dB Comm. Inc.

Drop Material

Adapt Comm. Supply Co. Inc.
 Adderley Ind. Inc.
 American Marketing Systems Inc.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 Baltimore Cable Supply Inc.
 Budco Inc.
 CATV Services Inc.
 CWY Electronics
 Cable Security Systems Inc.
 Cable Services Co. Inc.
 Cable Tek Center
 Carolina Galvanizing Corp.
 Channel Master
 Channell Commercial Corp.
 Colormax Electronic Corp.
 Comm/Scope/General Instrument
 Diamond Comm.

Diversified Control Systems
 Donley International
 Facile Technologies Inc.
 Gamco Industries
 Gilbert Eng. Co. Inc.
 Integral Corp.
 Intercept Corp.
 Interstate Cable Enterprises Inc.
 Jerry Conn Assoc., Inc.
 Lindsay Speciality Products Ltd.
 Marmax Sales
 Midwest CATV
 North Supply Co.
 Northern CATV Sales Inc.
 OEM Sales
 PICO MACOM
 Passive Devices, Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Preformed Line
 Qintar Inc.
 RMS Electronics
 RMT Engineering Inc.
 Raychem CATV Broadband
 Sachs Comm. Inc.
 Sigmacom
 System Services Cable Construction Inc.
 TPC Connectors
 Tamaqua Cable Products Corp.
 Telcraft Products Corp.
 The Headend
 Toner Cable Equipment Co.
 U S Television Systems Inc.
 United Satellite Systems
 Viewsonics Inc.
 Washington Cable Supply Inc.
 Weeks, John Enterprises
 Weldone Trading Co. Inc.
 Western CATV Distributors, Inc.
 White Radio Ltd.

Engineering Consultants

A.F. Assoc.
 Abcon Assoc. Inc.
 Advanced Technology
 American Earthstations Inc.
 Avtec Industries Inc.
 B E & K Comm., Inc.
 BK Labs Inc.
 Biro Engineering
 Bond Assoc.
 Bose Assoc. Inc.
 CATV Design Assoc. Inc.
 CZ Labs
 Cable Comm.
 Cable Consultants Inc.
 Cable Services Co. Inc.
 Cable System Survey Co.
 Cable TV Contracting
 Clover Cable Systems
 Coaxial Construction Corp.
 Cochran Comm. Const.
 Comlink Systems Inc.
 Commercial Satellite Systems
 Comm. Engineering
 Comsat Technical Services
 Comsearch Inc.
 Contel Business Systems
 Cooper-Rutter Assoc. Inc.
 Donley International, Inc.
 Douserv Consulting Corp.
 Futronics Inc.
 Henkels & McCoy, Inc.
 Herbert Boyer Co.
 IncoSpec Electronics
 Irwin Industries Inc.
 K & B Engineering
 Keiser Engineering Inc.
 Kinsman Design Assoc., Inc.
 Lightning Eliminators & Consultants
 MAI Comm., Inc.
 Malarkey-Taylor Assoc. Inc.
 Mastercom
 Munn Jr., E Harold & Assoc.
 Nacom Construction Corp.
 Nel Network Engineering Ltd.
 Norman Weinhouse Assoc.
 P & B Enterprises
 Page OD - Professional Engineering & Consultants
 Pyramid Cable Services Inc.
 RFI Comm., Inc.
 Reed Comm.
 Rosstek Comm. Ltd.
 S.B.M. Comm.
 SDI Services Inc.

Satellite Systems Engineering Inc.
 Sigmacom
 Spectrum Planning Inc.
 Stark & Assoc.
 Step Electronics Inc.
 Stern Telecomm. Corp.
 System Services Cable Construction Inc.
 Technetronics Inc.
 Tele-Engineering
 Tele-Spectrum Inc.
 U S Television Systems Inc.
 U.S. Cable Inc.
 United Satellite Systems
 Viewsonics Inc.
 Warren L. Braun Consulting Eng.
 Western CATV Distributors, Inc.
 dB Comm., Inc.

Full-Line Distributors

Adapt Comm. Supply Co. Inc.
 Anixter-Tele-Wire
 Baltimore Cable Supply, Inc.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 Cable Services Co. Inc.
 Colormax Electronic Corp.
 Comlink Systems Inc.
 Donley International, Inc.
 Electrotex
 IncoSpec Electronics
 Interstate Cable Enterprises, Inc.
 Jerry Conn Assoc., Inc.
 Lindsay Speciality Products Ltd.
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 Midwest Comm. Corp.
 NCS Industries Inc.
 North Supply Co.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc. Supply
 Co. Inc.
 Qintar Inc.
 RFI Comm., Inc.
 RMS Electronics
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 Temtron Electronics Ltd.
 Toner Cable Equipment Co.
 Vibra-King Inc.
 Washington Cable Supply, Inc.
 Weeks, John Enterprises
 Western CATV Distributors, Inc.

Installation Contractors

A.F. Assoc.
 AM Comm. Inc.
 Adderley Ind. Inc.
 Aerowave Ltd.
 American Earthstations, Inc.
 B E & K Comm. Inc.
 C & S Construction Inc.
 CATV AMIC Co.
 CATV Subscriber Services, Inc.
 CF Towers
 CZ Labs
 Cable Comm. Construction, Inc.
 Cable Comm. Inc.
 Cable Consultants, Inc.
 Cable Services Co. Inc.
 Cable TV Contracting
 Cablemasters Corp.
 Cecon, Inc.
 Cochran Comm. Const.
 Contract Installers Inc.
 English Enterprises
 Excalibur Cable Comm. Ltd.
 Gabriel Electronics, Inc.
 Harrell Enterprises of Ill.
 Henkels & McCoy, Inc.
 Holbury Precision Plastics
 Interstate Dropline Installers, Inc.
 Irwin Industries Inc.
 Jacobs Trenching Mfg.
 Lakeshore Cable Contractors, Inc.
 Microflect Co., Inc.
 Mucip Cable TV Services
 Nacom Construction Corp.
 Pyramid Cable Services Inc.
 RFI Comm., Inc.
 Ross Comm. Inc.
 SDI Services Inc.
 Sigmacom
 Summit Cable
 Superior Cablevision Installers Inc.

System Services Cable Construction Inc.
 U S Television Systems Inc.
 United Satellite Systems
 Western CATV Distributors, Inc.

Management Information Systems

B E & K Comm. Inc.
 Birchwind Infosystems Ltd.
 CableTEK
 Channelmatic Inc.
 Computer Utilities Services/Ozarks
 Creative Management Systems, Inc. (CMS)
 Diversified Control Systems
 First Data Resources Inc.
 Grumman Electronics Systems
 Information Systems Development, Inc.
 International Technology Group, Inc.
 KMP Computer Systems
 LDM, Inc.
 Melita Electronics Labs, Inc.
 Parallax
 Phoenix Cable/Lease
 Sprucer CATV Group
 Tele-Spectrum Inc.
 Texscan Corp.
 Toner Cable Equipment Co.

Microwave Systems

Andrew Antenna Co. Ltd.
 Avantek Inc.
 B E & K Comm. Inc.
 CATEL Telecomm.
 Cable Exchange, Inc.
 Cable Services Co. Inc.
 Channel Master
 Comlink Systems Inc.
 Donley International, Inc.
 Gabriel Electronics, Inc.
 General Electric Co.
 Global Systems Corp.
 Harris Broadcast Microwave
 Hughes Aircraft Co. Microwave Comm.
 L & R Comm. Ltd.
 Lance Industries
 Lightning Electric of PA Inc.
 M A-COM MAC Corp.
 Mark Antenna Products Inc.
 Mega Hertz Sales
 Microflect Co., Inc.
 Midwest Comm. Corp.
 Norman Weinhouse Assoc.
 North Supply Co.
 Phoenix Cable/Lease
 Rohn
 Sabre Comm. Corp.
 Sigmacom
 Technetronics Inc.
 Tele-Spectrum Inc.
 Texscan Corp.
 UNR-Rohn-Div. of UNR Inc.
 United Satellite Systems
 Walton Towers Inc.
 Warren L. Braun Consulting Eng.
 Western CATV Distributors, Inc.

Modems

Anixter-Tele-Wire
 C-COR Electronics Inc.
 CATEL Telecomm.
 COM-TEK
 CSI Technologies
 CWY Electronics
 Cable Exchange, Inc.
 Cable Services Co. Inc.
 Colormax Electronic Corp.
 ComSE Sales Corp.
 Comlink Systems Inc.
 DGH Comm. Systems Ltd.
 Digitel
 EF Data Corp.
 FM Systems, Inc.
 Fairchild Data Corp.
 Halley Systems
 Harris Corp. Satellite Comm. Div.
 Interface Technology, Inc.
 LNR Comm., Inc.
 M A-COM Telecomm.
 Mega Hertz Sales
 NCS Industries Inc.
 North Supply Co.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 R. Alan Comm., Inc.
 RFI Comm., Inc.
 RMT Engineering Inc.
 Radyne Corp.

Rosstek Comm. Ltd.
 Sytek Inc.
 U.S. Cable Inc.; Western CATV Distributors, Inc.
 dB Comm., Inc.

Modulators/Demodulators

Anixter-Tele-Wire
 Automation Techniques Licensed
 B E & K Comm. Inc.
 BK Labs, Inc.
 Blonder-Tongue Laboratories Inc.
 CADCO Inc.
 CATEL TeleComm.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 Cable Exchange, Inc.
 Cable Link, Inc.
 Cable Services Co. Inc.
 ComSE Sales Corp.
 Comlink Systems Inc.
 Donley International, Inc.
 EPD Electronics, Inc.
 FM Systems, Inc.
 Fairchild Data Corp.
 General Electric Co.
 Global Systems Corp.
 Harris Broadcast Microwave
 IncoSpec Electronics
 Interstate Cable Enterprises, Inc.
 Jerrold/General Instrument
 Jerry Conn Assoc., Inc.
 Learning Industries
 Magnavox CATV Systems, Inc.
 Marmax Sales
 Mega Hertz Sales
 Microdyne Corp.
 Midwest CATV
 Midwest Comm. Corp.
 NCS Industries Inc.
 Norsat International Inc.
 OEM Sales
 PICO MACOM
 Passive Devices, Inc.
 Phoenix Cable/Lease
 Pico Products Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Precise Mfg. Co.
 Qintar Inc.
 R. Alan Comm., Inc.
 RFI Comm., Inc.
 RMS Electronics
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 Sigmacom
 Signal Processing
 Starvision Sales
 Tektronix Inc.
 Telemet Div. of Geotel Inc.
 The Headend
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 Tulsat Corp.
 U S Television Systems Inc.
 Weeks, John Enterprises
 Wegener Comm. Inc.
 Western CATV Distributors, Inc.
 White Radio Ltd.
 dB Comm., Inc.

PPV Ordering Systems

AT&T
 Cable Services Co. Inc.
 Dialog Comm. Corp.
 Electroline TV Equipment Inc.
 Interface Technology, Inc.
 Jerrold/General Instrument
 Kanematsu-Gosho (USA) Inc./Sprucer
 La Kart Corp.
 MAAST Inc.
 Midwest CATV
 Oak Comm., Inc.
 Perception Technology
 Phoenix Cable/Lease
 Pioneer Comm. of America Inc.
 Sprucer CATV Group
 TOCOM/General Instrument
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 World Video Library Inc.

Passives

AVA Electronics Corp.
 Adapt Comm. Supply Co. Inc.

Anixter-Tele-Wire
 B E & K Comm. Inc.
 Baltimore Cable Supply, Inc.
 Blonder-Tongue Laboratories Inc.
 C-COR Electronics Inc.
 CATV Services Inc.
 CWY Electronics
 CZ Labs
 Cable Link, Inc.
 Cable Services Co. Inc.
 Cabletenna Corp.
 California Amplifier
 Channel Master
 Colormax Electronic Corp.
 Comlink Systems Inc.
 Donley International, Inc.
 EPD Electronics, Inc.
 Electroline TV Equipment, Inc.
 Electrorex
 Gamco Industries
 Gilbert Eng. Co. Inc.
 Incospec Electronics
 Intercept Corp.
 Interstate Cable Enterprises, Inc.
 Jerrold/General Instrument
 Jerry Conn Assoc., Inc.
 Lindsay Speciality Products Inc.
 Magnavox CATV Systems, Inc.
 Marmax Sales
 Mastercom
 Mega Hertz Sales
 Microwave Filter Co. Inc.
 Midwest CATV
 NCS Industries Inc.
 Northern CATV Sales Inc.
 OEM Sales
 PICO MACOM
 Passive Devices, Inc.
 Pico Products Inc.
 Pitts, T.R. Co.
 PolyPhaser Corp.
 Power & Telephone Supply Co. Inc.
 Production Products Co. Assoc.
 Pyramid Industries Inc.
 Qintar Inc.
 RFI Comm., Inc.
 RMS Electronics
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 Starvision Sales
 TPC Connectors
 Texscan Corp.
 The Headend
 Toner Cable Equipment Co.
 Trompeter Electronics Inc.
 U S Television Systems Inc.
 United Satellite Systems
 Viewsonics Inc.
 Washington Cable Supply, Inc.
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 White Radio Ltd.
 dB Comm., Inc.

Pedestals/Enclosures/Lockboxes

Adapt Comm. Supply Co. Inc.
 Advance Telecom
 American Marketing Systems Inc.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 Baltimore Cable Supply, Inc.
 Benner-Nawman Inc.
 C-COR Electronics Inc.
 CATV Services Inc.
 CWY Electronics
 Cable Security Systems, Inc.
 Cable Services Co. Inc.
 Cable Tek Center
 Carson Ind. Inc.
 Channell Commercial Corp.
 Coastal Engineered Products Co., Inc.
 Diamond Comm. Products, Inc.
 Diversified Control Systems
 Federal Telecom Inc.
 Incospec Electronics
 Interstate Cable Enterprises, Inc.
 Inventronics, Ltd.
 Jerry Conn Assoc., Inc.
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 North Supply Co.
 Passive Devices, Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Pyramid Industries Inc.

RMS Electronics
 Reliable Electric Utility Products
 Superior Metal Products Inc.
 Supra Key Control Ltd.
 Telecrafter Products Corp.
 Toner Cable Equipment Co.
 U S Television Systems Inc.
 Viewsonics Inc.
 Washington Cable Supply, Inc.
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 White Radio Ltd.
 dB Comm., Inc.

Power Supplies

Adapt Comm. Supply Co. Inc.
 Advance Telecom
 Alpha Technologies
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 BK Labs, Inc.
 Baltimore Cable Supply, Inc.
 Blonder-Tongue Laboratories Inc.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 Cable Services Co. Inc.
 ComSE Sales Corp.
 Comlink Systems Inc.
 Data Transmission Devices, Inc.
 Donley International, Inc.
 Electra Motion, Inc.
 Gamco Industries
 Halley Systems
 Incospec Electronics
 Interstate Cable Enterprises, Inc.
 Jerry Conn Assoc., Inc.
 Larson Electronics
 Leader Instruments Corp.
 Lectro Products, Inc.
 Magnavox CATV Systems Inc.
 Mega Hertz Sales
 Midwest CATV
 NCS Industries Inc.
 OEM Sales
 PICO MACOM
 Passive Devices, Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Power Conversion Products Inc.
 Power Technologies
 R. Alan Comm., Inc.
 RMS Electronics
 RMT Engineering Inc.
 Siltron Illumination Inc.
 Sola
 Sparks Equipment
 Texscan Corp.
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 U S Television Systems Inc.
 Viewsonics Inc.
 Washington Cable Supply, Inc.
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 dB Comm., Inc.

Receivers

Adapt Comm. Supply Co. Inc.
 Andrew Antenna Co. Ltd.
 Anixter-Tele-Wire
 Automation Techniques Licensed
 B E & K Comm. Inc.
 Blonder-Tongue Laboratories Inc.
 CATEL TeleComm.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 Cable Exchange, Inc.
 Cable Services Co. Inc.
 Channel Master
 Colormax Electronic Corp.
 Comlink Systems Inc.
 Donley International, Inc.
 Drake, R.L. Co.
 Global Systems Corp.
 Harris Corp. Satellite Comm. Div.
 Incospec Electronics
 Interstate Cable Enterprises, Inc.
 Jerry Conn Assoc., Inc.
 LNR Comm., Inc.
 Marmax Sales
 McCullough Satellite Equipment Inc.
 Mega Hertz Sales
 Microdyne Corp.
 Midwest CATV

Midwest Comm. Corp.
 NCS Industries Inc.
 OEM Sales
 PICO MACOM
 Phoenix Cable/Lease
 Pico Products Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Qintar Inc.
 R. Alan Comm., Inc.
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 Satcom Technologies Inc.
 Sigmacom
 Signal Processing
 Starvision Sales
 The Headend
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 Tulsat Corp.
 U S Television Systems Inc.
 VideoCipher/General Instrument
 Weeks, John Enterprises
 Wegener Comm. Inc.
 Western CATV Distributors, Inc.

Repair-Converter/ Distribution & Test Equipment

Authorized Parts Co.
 Automation Techniques Licensed
 B E & K Comm. Inc.
 BK Labs, Inc.
 Brad Cable Electronics Inc.
 CATV Services Inc.
 COM-TEK
 CSI Technologies
 Cable Comm. Construction, Inc.
 Cable Link, Inc.
 Cable Services Co. Inc.
 Cable Television Services
 Cable Terminal Services, Inc.
 Cabletenna Corp.
 ComSE Sales Corp.
 Comlink Systems Inc.
 Compu-Trace Inc.
 Converter Parts, Inc.
 Digitrace Inc.
 ECTV Inc.
 Electrodyne Inc.
 Incospec Electronics
 Independence Electronics
 Intrastellar Electronics, Inc.
 Island Cable Electronics
 JGL Electronics Inc.
 MAI Comm., Inc.
 Magnavox CATV Systems, Inc.
 NCS Industries Inc.
 Northeast Cable Electronics Inc.
 PTS/KATEK
 Pioneer Comm. of America Inc.
 Precise Mfg. Co.
 Quality RF Services Inc.
 RF Analysts Inc.
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 Texscan Corp.
 The Headend
 Tulsat Corp.
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 dB Comm., Inc.

Satellite Receive Equipment

Andrew Antenna Co. Ltd.
 Anixter-Tele-Wire
 Automation Techniques Licensed
 Avante Inc./T.M.A. Div.
 B E & K Comm. Inc.
 BK Labs, Inc.
 Baltimore Cable Supply, Inc.
 Blonder-Tongue Laboratories Inc.
 COM-TEK
 CWY Electronics
 Cable Exchange, Inc.
 Cable Services Co. Inc.
 California Amplifier
 Channel Master
 Colormax Electronic Corp.
 Comlink Systems Inc.
 Comsat Technical Services
 Comtech Antenna Div.
 Donley International, Inc.
 Drake, R.L. Co.
 Electrorex
 Global Systems Corp.

Harris Corp./Satellite Comm. Div.
 Incospec Electronics
 Interstate Cable Enterprises, Inc.
 Jerrold/General Instrument
 Jerry Conn Assoc., Inc.
 LNR Comm., Inc.
 McCullough Satellite Equipment Inc.
 Mega Hertz Sales
 Microdyne Corp.
 Midwest CATV
 Midwest Comm. Corp.
 NCS Industries Inc.
 Norman Weinhouse Assoc.
 Norsat International Inc.
 OEM Sales
 PICO MACOM
 Phoenix Cable/Lease
 Pico Products Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Qintar Inc.
 R. Alan Comm., Inc.
 Rosstek Comm. Ltd
 Sigmacom
 Spectrum Planning Inc.
 Standard Comm. Corp.
 Starvision Sales
 The Headend
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 Tulsat Corp.
 U S Television Systems Inc.
 VideoCipher/General Instrument
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 Zephyrus Electronics Ltd.

Scramblers/Encoders

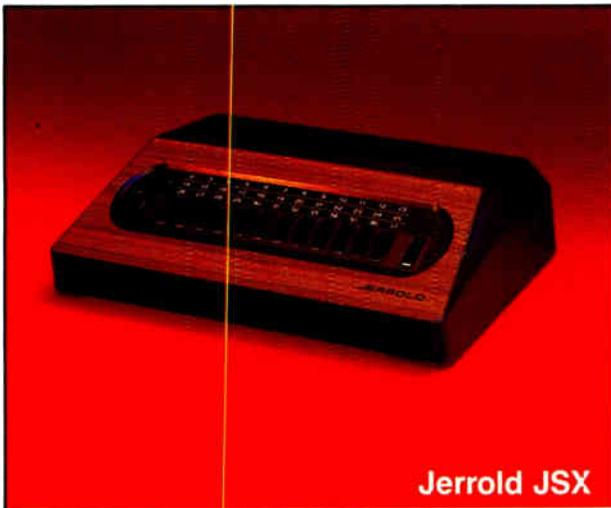
Anixter-Tele-Wire
 B E & K Comm. Inc.
 Baltimore Cable Supply, Inc.
 Blonder-Tongue Laboratories Inc.
 Brad Cable Electronics Inc.
 Cable Exchange, Inc.
 Cable Link, Inc.
 Cable Services Co. Inc.
 Colormax Electronic Corp.
 Comlink Systems Inc.
 Digilink
 General Electric Co.
 Incospec Electronics
 Intercept Corp.
 Jerrold/General Instrument
 Kanematsu-Gosho (USA) Inc./Sprucer
 MA-COM Telecomm.
 MAAST Inc.
 Magnavox CATV Systems, Inc.
 Mega Hertz Sales
 Microdyne Corp.
 Midwest CATV
 NCS Industries Inc.
 Northern CATV Sales Inc.
 Oak Comm., Inc.
 Phoenix Cable/Lease
 Pico Products Inc.
 Pitts, T.R. Co.
 RMS Electronics
 RMT Engineering Inc.
 Sprucer CATV Group
 Starvision Sales
 TOCOM/General Instrument
 Toner Cable Equipment Co.
 United Satellite Systems
 VideoCipher/General Instrument
 Western CATV Distributor, Inc.
 White Radio Ltd.
 Zenith Cable Products Div.

Signal Processors/Combiners

Andrew Antenna Co. Ltd.
 Anixter-Tele-Wire
 Applied Instruments
 Automation Techniques Licensed
 B E & K Comm. Inc.
 BK Labs, Inc.
 Blonder-Tongue Laboratories Inc.
 CADCO Inc.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 CZ Labs
 Cable Call Corp.
 Cable Exchange, Inc.
 Cable Services Co. Inc.
 Channel Master
 ComSE Sales Corp.

From basic to deluxe

ANIXTER® stocks the complete line of Jerrold convertors



Jerrold JSX



Jerrold Starcom VI DQN



**Jerrold Starcom VI DP5
(DPV5 with volume control)**

From the basic, to the most sophisticated model, Anixter has a Jerrold convertor to meet your requirements.

Jerrold JSX

The most widely-used non-addressable convertor in the industry. Basic 36-channel, electromechanical model offers durability and convenience at a reasonable price.

Jerrold Starcom VI DQN

An 82-channel digital convertor with all the latest subscriber features: parental guidance, channel wrap-around, barker channels, channel mapping, remote control, and last channel recall.

Jerrold Starcom VI DP5

Offers many addressable, impulse-ready, subscriber-pleasing features such as time-controlled programming and last channel recall. Also available is the Jerrold Starcom VI DPV5 with volume control.

No matter what features your subscribers desire (require), you can find the right Jerrold convertor at Anixter. To order, call toll free 1-800-323-0436.

ANIXTER® COMMUNICATIONS

CORPORATE HEADQUARTERS
ANIXTER BROS., INC., 4711 Golf Road, Skokie, IL 60076 (312) — Telex 289464
©1987 ANIXTER BROS., INC.

ANIXTER DEPT. JERR.
4711 Golf Rd., Skokie, IL 60076

Please send me more information on Jerrold Convertors.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____ CED101

Comlink Systems Inc.
 General Electric Co.
 Idea/ronics
 Incospec Electronics
 Interstate Cable Enterprises, Inc.
 Jerrold/General Instrument
 Magnavox CATV Systems, Inc.
 Mega Hertz Sales
 Midwest CATV
 NCS Industries Inc.
 OEM Sales
 PICO MACOM
 Phoenix Cable/Lease
 Pico Products Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Precise Mfg. Co.
 Qintar Inc.
 R. Alan Comm., Inc.
 RFI Comm., Inc.
 RMS Electronics
 RMT Engineering Inc.
 Rosstek Comm. Ltd.
 Starvision Sales
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 Tulsat Corp.
 U S Television Systems Inc.
 United Satellite Systems
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 White Radio Ltd.

Stereo Generators

Anixter-Tele-Wire
 BK Labs, Inc.
 Baltimore Cable Supply, Inc.
 CATEL Telecomm.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 ComSE Sales Corp.
 Comlink Systems Inc.
 Donley International, Inc.
 FM Systems, Inc.
 Incospec Electronics
 Jerrold/General Instrument
 Leader Instruments Corp.
 Learning Industries
 Mega Hertz Sales
 Midwest CATV
 NCS Industries Inc.
 Phoenix Cable/Lease
 Pitts, T.R. Co.
 Sigmacom
 Standard Comm. Corp.
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 Weeks, John Enterprises
 Wegener Comm. Inc.
 Western CATV Distributors, Inc.

Stereo Decoders

Anixter-Tele-Wire
 Baltimore Cable Supply, Inc.
 CWY Electronics
 Cable Call Corp.
 Cable Exchange, Inc.
 Cabletenna Corp.
 ComSE Sales Corp.
 Comlink Systems Inc.
 FM Systems, Inc.
 Incospec Electronics
 Jerrold/General Instrument
 Learning Industries
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 OEM Sales
 PICO MACOM
 Phoenix Cable/Lease
 Pico Products Inc.
 Pitts, T.R. Co.
 Sigmacom
 Spectrum Planning Inc.
 Standard Comm. Corp.
 Starvision Sales
 Toner Cable Equipment Co.
 Weeks, John Enterprises
 Wegener Comm. Inc.
 Western CATV Distributors, Inc.
 Zenith Cable Products Div.
 dB Comm., Inc.

System Design

A.F. Assoc.
 American Earthstations, Inc.

Andrew Antenna Co. Ltd.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 Blonder-Tongue Laboratories Inc.
 CATV Design Assoc. Inc.
 Cable Comm. Construction, Inc.
 Cable Services Co. Inc.
 Cable System Survey Co.
 Cable TV Contracting
 Coaxial Construction Corp.
 Cochran Comm. Const.
 Comlink Systems Inc.
 Contel Business Systems
 Donley International, Inc.
 Douserv Consulting Corp.
 General Electric Co.
 Incospec Electronics
 Intern'l Optical Telecomm.
 JFW Industries, Inc.
 Jerrold/General Instrument
 Keiser Engineering Inc.
 Kinsman Design Assoc., Inc.
 Lakeshore Cable Contractors, Inc.
 Magnavox CATV Systems, Inc.
 Mastercom
 Microdyne Corp.
 Midwest CATV
 Nacom Construction Corp.
 Nel Network Engineering Ltd.
 Norsat International Inc.
 Page OD - Professional Engineering
 & Consultants
 Pyramid Cable Services Inc.
 RF Distribution Systems
 RFI Comm., Inc.
 Reed Comm.
 Rosstek Comm. Ltd.
 SDI Services Inc.
 Siecor Corp.
 Sigmacom
 Technetronics Inc.
 Tele-Engineering
 Tele-Spectrum Inc.
 Texscan Corp.
 Toner Cable Equipment Co.
 Triple Crown Electronics Inc.
 U S Television Systems Inc.
 U.S. Cable Inc.
 Western CATV Distributors, Inc.

Tap/Subscriber Audits

Anixter-Tele-Wire
 B E & K Comm. Inc.
 B-Line Construction
 CATV AMIC Co.
 Cablemasters Corp.
 Cecon, Inc.
 Cochran Comm. Const.
 Contract Installers Inc.
 Cooper-Rutter Assoc. Inc.
 Diversified Control Systems
 Electroline TV Equipment, Inc.
 Gamco Industries
 Interstate Dropline Installers, Inc.
 Lakeshore Cable Contractors, Inc.
 Mastercom
 Midwest CATV
 Mucip Cable TV Services
 Power & Telephone Supply Co. Inc.
 Pyramid Cable Services Inc.
 S.B.M. Comm.
 SBI Services Inc.
 Superior Cablevision Installers Inc.
 Technetronics Inc.
 Tele-Engineering
 Viewsonics Inc.

Test Equipment

3M/Test
 A.F. Associates
 AVCOM of Virginia Inc.
 Adapt Comm.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 BK Labs, Inc.
 Baltimore Cable Supply, Inc.
 Biddle Instruments
 Brad Cable Electronics Inc.
 Brad/RF/Superior
 CATV Services Inc.
 CWY Electronics
 CZ Labs
 Cable Link, Inc.
 Cable Services Co. Inc.
 Channel Master
 ComSE Sales Corp.
 Electrotext

FM Systems, Inc.
 Hewlett-Packard
 Hitachi Denshi America
 IFR Systems Inc.
 Incospec Electronics
 Interstate Cable Enterprises Inc.
 JFW Industries, Inc.
 Jerry Conn Assoc., Inc.
 Klein Tools, Inc.
 LRC Electronics, Inc.
 Leader Instruments Corp.
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 NCS Industries Inc.
 North Supply Co.
 Phoenix Cable/Lease
 Pitts, T.R. Co.
 PolyPhaser Corp.
 Power & Telephone Supply Co. Inc.
 Progressive Electronics Inc.
 R. Alan Comm., Inc.
 RF Analysts Inc.
 RMT Engineering Inc.
 Radar Engineers
 Riser-Bond Instruments
 Scientific-Atlanta Inc.
 Sencore
 Siecor Corp.
 Sigmacom
 Tektronix Inc.
 Telemet Div. of Geotel Inc.
 Temtron Electronics Ltd.
 Test Systems/ESP Inc.
 Texscan Corp.
 Texscan Instrument Div.
 Toner Cable Equipment Co.
 Triplett Corp.
 Videotek Inc.
 Viewsonics Inc.
 Vitek Electronics Inc.
 Wavetek RF Products, Inc.
 Weeks, John Enterprises
 Western CATV Distributors, Inc.
 Wide Band Engineering Co. Inc.

Tools

A.B. Chance Co.
 AEG Power Tool
 Adapt Comm.
 Anixter-Tele-Wire
 B E & K Comm. Inc.
 Baltimore Cable Supply Inc.
 Benner-Nawman Inc.
 Budco Inc.
 CATV Services Inc.
 CSI Technologies
 CWY Electronics
 CZ Labs
 Cable Prep/Ben Hughes Comm. Prod. Co.
 Cable Services Co. Inc.
 Cable Tek Center
 Channel Master
 Contel Business Systems
 Devine's Machine
 Electrotext
 General Machine Products Co., Inc.
 Gilbert Eng. Co. Inc.
 Interstate Cable Enterprises Inc.
 Jensen Tools, Inc.
 Jerry Conn Assoc., Inc.
 Klein Tools, Inc.
 Lemco Tool
 Marmax Sales
 Mega Hertz Sales
 Midwest CATV
 Multilink
 North Supply Co.
 Northern CATV Sales Inc.
 OEM Sales
 PICO MACOM
 Passive Devices, Inc.
 Pico Products Inc.
 Pitts, T.R. Co.
 Pow-R Devices, Inc.
 Power & Telephone Supply Co. Inc.
 Qintar Inc.
 RMS Electronics
 RMT Engineering Inc.
 Ripley Co. Inc.
 Ripley Co. Inc. Utility Tool Div.
 Sachs Comm. Inc.
 Siecor Corp.
 Telecrafter Products Corp.
 United Satellite Systems
 Vibra-King Inc.
 Viewsonics Inc.

Washington Cable Supply, Inc.
 Western CATV Distributors, Inc.
 White Radio Ltd.

Towers

Andrew Antenna Co. Ltd.
 B E & K Comm. Inc.
 CF Towers
 CWY Electronics
 Cable Services Co. Inc.
 Electrotext
 Incospec Electronics
 Interstate Cable Enterprises Inc.
 L & R Comm. Ltd.
 Marmax Sales
 Mega Hertz Sales
 Microflect Co., Inc.
 Owens Tower Co.
 Sabre Comm. Corp.
 Sigmacom
 Starvision Sales
 The Headend
 Toner Cable Equipment Co.
 UNR-Rohn-Div. of UNR Inc.
 United Satellite Systems
 Western Towers

Traps/Filters

Adapt Comm.
 Anixter-Tele-Wire
 Automation Techniques
 B-Line Construction
 Baltimore Cable Supply Inc.
 Blonder-Tongue Laboratories Inc.
 CATV Services Inc.
 COM-TEK
 CWY Electronics
 Cable Link, Inc.
 Cable Services Co. Inc.
 Channel Master
 Colormax Electronic Corp.
 Contract Installers Inc.
 Donley International, Inc.
 Electroline TV
 Gamco Industries
 Incospec Electronics
 Intercept Corp.
 Interstate Cable Enterprises Inc.
 Jerry Conn Assoc., Inc.
 MLE/Main Line Equipment Co.
 Marmax Sales
 Mega Hertz Sales
 Microwave Filter Co. Inc.
 Northern CATV Sales Inc.
 OEM Sales
 PICO MACOM
 Passive Devices, Inc.
 Pico Products Inc.
 Pitts, T.R. Co.
 Power & Telephone Supply Co. Inc.
 Production Products Co. Assoc.
 Qintar Inc.
 R. Alan Comm., Inc.
 RF Monolithics Inc.
 RMS Electronics
 RMT Engineering Inc.
 Sigmacom
 Starvision Sales
 Texscan Corp.
 The Headend
 Toner Cable Equipment Co.
 Tulsat Corp.
 United Satellite Systems
 Viewsonics Inc.
 Vitek Electronics Inc.
 Washington Cable Supply, Inc.
 Western CATV Distributors, Inc.
 White Radio Ltd.
 dB Comm., Inc.

Trenchers/Plows

American Trencher Inc.
 B E & K Comm. Inc.
 Burkeen Mfg. Co.
 Condux Int'l, Inc.
 E-Z TRENCH MGF. CO. INC.
 Ground Hog Inc.
 Hall Equipment & Supply Co.
 JI Case Co.
 Jacobs Trenching Mfg.
 Line Ward Corp.
 Phoenix Cable/Lease
 Seaman-Parsons Corp.
 U S Television Systems Inc.
 Vermeer Manufacturing
 Vibra-King Inc.
 Weeks, John Enterprises

(ICA) (714) 720-0138
 Int'l. Comm. Assoc.
 1550 Bayside Dr.
 Corona Del Mar, CA 92625
 PERSONNEL: Fred Fourcher
 DESCRIPTION: Manufacture satellite antennas including Miralite's well known 3.7 meter and the 78 percent efficient 2.4 meter.

3M/Test. (800) 426-8688
 Measurement Systems
 PO Box 2963
 Austin, TX 78769-2963
 PERSONNEL: Merle Ackerman, General Manager; Joe Minarovic, Market Manager
 DESCRIPTION: Manufacturers of cable locator Dynatel 500A/C, sheath fault and cable locator Dynatel 573A/C, for use on buried CATV trunk, distribution and service drop cable runs.

A. B. Chance Co. (314) 682-5521
 210 N Allen
 Centralia, MO 65240
 PERSONNEL: Leif Loma, President; Jim Mullen, Vice President/Marketing; Harry Young, Vice President/Sales; Al Knepfer, Vice President/Distributor Relations
 DESCRIPTION: Manufacturer of electric utility products.

A.F. Associates. (201) 767-1000
 100 Stonehurst Court
 Northvale, NJ 07647
 PERSONNEL: Tom Cansvan, Vice President/General Manager; Richard Lunniss, Vice President/Director of Sales; Marc Bressack, Manager of Broadcast Sales
 REGIONAL OFFICES: 10650 Scripps Ranch Blvd., Suite 200, San Diego, CA 92131, (619) 530-2970.
 DESCRIPTION: A.F. Associates has become the nation's largest dedicated designer and builder of video systems. Our credits now include: major studio installations, computerized editing and color correction suites, videotape and videocassette duplication facilities, cable network control and program organization centers, sports area production and camera systems, mobile production vans, and a host of highly advanced, special purpose television installations. Services include design, engineering, consultation, specification, procurement, fabrication, customization, installation, testing and training of turnkey facilities, sales and service of products. Professional factory authorized service center for Sony, Panasonic and Sharp.

ABC Cable Products, Inc. (303) 694-6789
 WATS(National). (800) 422-2567
 5730 E. Otero Ave.
 Englewood, CO 80112
 PERSONNEL: Harold Bjorklund, President/CEO
 DESCRIPTION: Manufacturers and distributors of wireless remote control transmitters that are compatible with CATV converters manufactured by Jerrold, Scientific-Atlanta, Tbcorn, Oak, Hamlin, Zenith and others. Distributed by: Capscan Cable Products, Cable Business Assoc.

ABM Sales Inc. (604) 931-3115
 2710 Clarke St.
 Port Moody, B.C., V3H 1Z1
 PERSONNEL: Max Andreone, President; Bruno Andreone, Vice President
 REGIONAL OFFICES: PO Box Q-1, Blaine, WA 98230.
 DESCRIPTION: Manufacturer/Distributor of: "F" connectors, jumper cords, pay TV/VCR switchers, speciality ohm mini coax cable.



AD Systems Inc. (801) 263-1661
 6138 S. 380 West
 Murray, UT 84107
 PERSONNEL: Gerald Van Mondfrans, President; Bob Hall, Vice President
 DESCRIPTION: Ad Systems' complete line of ad insertion equipment makes local ad sales more profitable by providing lower initial investment and ongoing labor savings. All systems are expandable and range from our low cost, four channel, one VCR insertion system through our four channel, four VCR, random access system. Ongoing labor costs are reduced by using the cost effective Automated Break Complier (ABC-100) to eliminate the tedious time consuming process of editing and tone cueing the "on air" tapes. Ad Systems also is a supplier of the graphics and text insertion systems especially suitable to small cable and SMATV operations.

AEG Power Tool. (203) 447-4600
 WATS(National). (800) 243-0870
 3 Shaw's Cove
 New London, CT 06320
 PERSONNEL: Bernard Hartmann, President; C.E. Mal, Treasurer/Controller
 DESCRIPTION: AEG markets heavy-duty drills, hammer drills, rotary hammers, power screwdrivers, woodworking tools, battery tools, grinders, cut-off machines and metal working tools for the construction industry.

AM Cable TV Ind. Inc. (215) 536-1354
 PO Box 505
 Quakertown, PA 18951
 PERSONNEL: Tom Saldi, CEO/Chairman of the Board; Tony Ditlow, CFO; Stanford Cook, Vice President/Manufacturing; Phillip Verruto, Vice President/Sales & Marketing
 DESCRIPTION: Full turnkey construction including aerial and underground systems engineering involvements—make ready engineering and systems design. E-Com Products multiple addressable services, digital data communications systems, Tier Guard Off-premises, addressable pay-TV control. Technical monitor and control system for local area networks.

AM Comm. Inc. (215) 536-1354
 1 AM Drive
 PO Box 505
 Quakertown, PA 18951
 PERSONNEL: Tom Saldi, President; Phillip Verruto, Vice President/Sales & Marketing; Mark Gross, National Sales Manager; Roger Stevens, Product Manager
 DESCRIPTION: Design, installation, certification, monitoring, and maintenance of broadband CATV and LAN systems, telephone and fiber optic. Design, development, and manufacture of an off-premises addressable control and delivery system (TierGuard®), and a broadband technical monitor and control system (LANguard®).



AT&T (314) 391-4123
 WATS(National) (800) 443-0738
 WATS(State). (800) 782-1202
 1111 Woods Mill Road
 Ballwin, MO 63011
 DESCRIPTION: Provider of cable television support services including fiber optic cable, RF signal leakage testing, grounding surveys, pay-per-view, as-built maps.

AVA Electronics Corp. (215) 284-2500
 4000 Bridge St.
 Drexel Hill, PA 19026
 PERSONNEL: Mario Rafalin, Ph.D., President; Michael Shore, Vice President/Sales & Marketing
 DESCRIPTION: Manufacturer of F, UHF, BNC, TNC, Twinax, and N connectors, adapters, and cable assemblies.

AVCOM of Virginia Inc. (804) 794-2500
 500 Southlake Blvd.
 Richmond, VA 23236
 PERSONNEL: R. Andrew Hatfield, President; Linda Abshire, Sales Manager
 DESCRIPTION: Manufacturer of microwave point-to-point antenna systems, including CARB band and studio transmitter links. All microwave transmission lines supplied i.e., elliptical, rectangular, and circular systems, plus accessories, including dry air pressurizers. Installation of antennas and microwave systems plus test and guarantee are provided by Gabriel.

Abcon Associates Inc. (516) 349-7760
 45 Executive Drive
 Plainview, NY 11803
 PERSONNEL: Michael Zenobio, President; Frank Wedl, Vice President
 DESCRIPTION: Abcon Associates Inc. provides design, construction, and construction management of cable operation facilities, programming facilities, office buildings, etc.

Aberdeen Co. (213) 202-2771
 5922 Bowcroft St.
 Los Angeles, CA 90016
 PERSONNEL: George Acker, President
 DESCRIPTION: Manufacturers and distributors of lashing wire and communication hardware.

Abiqua International. (503) 873-4181
 WATS(National). (800) 992-8459
 417 N Water St.
 PO Box 100
 Silverton, OR 97381
 PERSONNEL: Stu Rasmussen, Sales Manager
 DESCRIPTION: Low-cost ad insertion systems and equipment for small and very small cable systems.

Adams  Russell
 VIDEO INFORMATION SYSTEMS DIVISION

Adams-Russell Co. Inc. (617) 890-5850
 ARVIS Division
 WATS(National). (800) 272-7847
 300 Second St.
 Waltham, MA 02154

Adapt Comm.

PERSONNEL: John Lynch, President; Trevor Lambert, Vice President/Video Info. Syst.; Roger Strawbridge, Project Dir./Video Info. Syst.
DESCRIPTION: Adams-Russell Video Information Systems Division manufactures and markets automatic commercial insertion equipment for the cable and broadcast industries. ARVIS is a division of Adams-Russell Electronics, a multidivisional, international company in aerospace and high technology/electronic operations.

Adapt Comm. (516) 593-1790
 Supply Co. Inc.
 WATS(National). (800) 232-7826
 138 Prospect Ave.
 Hewlett, NY 11557

PERSONNEL: Daniel Pelz, President/National Sales Mgr.; Andrea Pelz, Corporate Secretary; Denise Smith, Operations Manager; Denise Marie Casamassima, Customer Service
DESCRIPTION: Full line distributor of cable television equipment specializing in: connectors, drop material, coaxial cable, traps and security devices, grounding materials, tools and safety equipment, heat shrink and enclosures.

Adderley Ind. Inc. (609) 227-8296
 1405 Chews Landing Road
 Laurel Springs, NJ 08021

PERSONNEL: Herb Adderley, President
REGIONAL OFFICES: PO Box 16030, Philadelphia, PA 19114, (215) 638-1420.

DESCRIPTION: Adderly Industries, Inc. is an installation company operating in the Mid-Atlantic marketing area with the capability of operating nationwide. We do aerial and underground cable TV installation work, MDU's (Multiple Dwelling Units) as well as security and CCTV installations. We are fully owned and certified minority company with excellent credentials.

ADVANCE Telecom Inc.

Advance Telecom. (602) 998-4441
 7895 E. Acoma
 Scottsdale, AZ 85260
PERSONNEL: Fred Kaiser, President; Robert O'Hara, Vice President; Susan Coady, Marketing Manager; Gay Montilla, Southwest Sales Manager; Suzan Smith, Customer Service Manager
DESCRIPTION: Manufacturers representative for Alpha Power Supplies and other cable related equipment.

Advanced Comm. (203) 777-7434
 Ind. Inc.

49-C Quinpiac Ave.
 North Haven, CT 06473
PERSONNEL: Michael Johnson, President; Richard Zorin, Vice President
REGIONAL OFFICES: 4509 W. Cayuga, Tampa, FL 33614, (813) 873-0660; 718 6th Ave. E., Bradenton, FL 33508, (813) 746-9853; 12290 49th St. N., Clearwater, FL 33520, (813) 578-0932; 10 Second St., Ye Olde Court House, Dover, NH 03820, (603) 749-1511; PO Box 3220, S. Pasadena, CA 91030, (818) 441-5279; 7999 Hansen, Ste. 310, Houston, TX 77061, (713) 943-1625; 4230 Rosehill, Ste. L-2, Garland, TX 75043, (214) 240-8175; 9910 Franklin St., Lanham, MD 20706, (301) 459-4033; 3446 Arcadia Dr., Ellicott City, MD 21043, (301) 461-6999; 1391 Route 130, Dayton, NJ 08810, (201) 329-0517; 4444 S.W. 71st Ave., Miami, FL 33155, (305) 284-1044.
DESCRIPTION: Our expertise in the cable industry

include, but are not limited to; Underground Construction; Aerial Construction; Splicing and Activation; Design and Strandmapping; MDU/Design Postwiring and Rewiring; Residential Installation/Drop Transfers; System Audits/As Builts; System Evaluation/Radiation Testing; Additionally servicing Telephone Construction and Installation; Installation of Burglar Systems and Installation of interactive interconnect services.

Advanced Comm. Inc. (313) 356-0525
 WATS(State). (800) 338-4224
 21421 Hilltop
 Unit #21

Southfield, MI 48034
PERSONNEL: Jeffrey Gendron, President; Daniel Kanaan, Vice President
DESCRIPTION: Residential installation, MDU pre/postwire, rebuilds, audits. Residential security enclosure installation.

Advanced Technology (703) 525-2664
 Systems Inc.

3426 N Washington Blvd.
 Arlington, VA 22205
PERSONNEL: John Renner, President; Henry DeFrancesco, Vice President
DESCRIPTION: Consulting engineers.

Aero Lift Co. (201) 575-7484

15 Fairfield Place
 W Caldwell, NJ 07006
PERSONNEL: Peter Bentley
DESCRIPTION: Manufacturer of aerial devices and cranes.

Aerowave Ltd. (303) 433-4812

2480 W. 26th Ave.
 #40B
 Denver, CO 80211-5504
PERSONNEL: Dave Sullivan, President; Robert Ducaj, Vice President; Al Baker, Sales Manager
DESCRIPTION: Consulting to manufacturers, distribute commercial cable equipment. General Instrument, Jerrold, Scientific-Atlanta, among others. System design and installation.

Alacrity Cable. (301) 721-2744

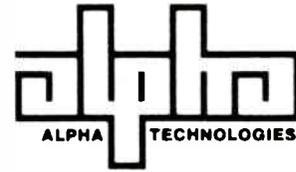
Collections Corp.
 177 Defense Hwy.
 Suite C - Nichols Center
 Annapolis, MD 21401
PERSONNEL: Susan Hayes, President
DESCRIPTION: Specializing in nationwide recovery of converters, decoders, etc., and past due accounts with very high success in securing reconnections.

Allen Systems Inc. (713) 943-7213

WATS(National). (800) 231-2077
 PO Box 750218
 Houston, TX 77275-0218
PERSONNEL: William Cameron, President; William Gordon, Vice President
DESCRIPTION: Underground warning tapes. Sell to distributors only.

Allied Steel & (216) 248-2600

Tractor Products Inc.
 5800 Harper Road
 Solon, OH 44139
PERSONNEL: Allen Springer, Vice President Sales & Marketing; Mike Camp, Marketing Manager; Renee Shane, Marketing Comm. Manager
DESCRIPTION: Construction tools including underground piercing tools (Hole-Hog), hydraulic impact hammers (Hy-Ram), pneumatic impact hammers (Ho-Ram), rotary hydraulic impact hammers (Rapid-Ram), underground construction vibratory compactors/drivers (Ho-Pac).



Alpha Technologies. (206) 647-2360

3767 Alpha Way
 Bellingham, WA 98226-8302
PERSONNEL: Fred Kaiser, President; Bob Bridge, Sales Manager
REGIONAL OFFICES: 7033 Antrim Ave., Burnaby, BC V5J 4M5, Canada, (604) 430-1476, FAX # (604) 430-8908.
DESCRIPTION: Manufacturer/distributor of CATV standby power supplies and status monitoring systems, computer UPS, telephone backup power conversion products.

Altec Ind. Inc. (205) 991-7733

PO Box 10264
 Birmingham, AL 35202
PERSONNEL: Lee Styslinger Jr., President; Howard Marshall, Vice President/Marketing
REGIONAL OFFICES: PO Box 10264, Birmingham, AL 35202, (205) 969-3400; 2106 S Riverside Road, St. Joseph, MO 64507, (816)364-2244; PO Box 68308, Indianapolis, IN 46268,(317) 872-3460.
DESCRIPTION: Altec manufactures and distributes utility equipment and bodies, including derricks, aerial lifts and reel lifters. The AT200 29-foot aerial lift features a two-section steel telescopic boom, ideal for CATV work. Also available in 25-foot version. They may be mounted on a chassis with body or van-mounted. The AT200 aerial lift is built rugged and suitable for rebuilding after years of service.

American Cable Contractors. . . (303) 340-4620

WATS(National). (800) 521-9916
 1700 Jasper St. Ste. A
 PO Box 110279
 Aurora, CO 80011
PERSONNEL: Carl Occhionero, President; Mike Occhionero, Vice President
DESCRIPTION: Experts in all areas of maintenance and construction for SMATV, CATV and TVRO systems. No job too large or too small.

American Comm. (609) 227-3328

Installations (ACI)
 1405 Chews Landing Road
 Laurel Springs, NJ 08021
PERSONNEL: Joseph Baker III, Executive Partner/GM; Frederic Deitrich, Vice President
REGIONAL OFFICES: 2165 NW 17th Ave., Miami, FL 33142, (305) 326-0582; 190 N Dupont Hwy. #25, Airport Industrial Center, New Castle, DE 19720, (302) 322-0427.
DESCRIPTION: ACI is a cable installation company, operating nationwide. It has a proven track record of excellence in the installation of CATV and SMATV systems. We do aerial and underground installations, as well as MDUs (Multiple Dwelling Units). We are a company dedicated to professionalism and quality workmanship; we are dedicated to performance.

American Earthstations, Inc. . . (503) 222-6000

0696 SW Bancroft St.
 Portland, OR 97201
PERSONNEL: Norman Hotz, President
REGIONAL OFFICES: 1140 Industrial Way, Tukwila, WA 98188, (206) 575-8888.
DESCRIPTION: Sell, install and service interactive cable systems along with terrestrial and satellite communications systems, and local area networks.

American Marketing (205) 821-0745
Systems Inc.
621 Stage Road
PO Box 1389
Auburn, AL 36831
PERSONNEL: Margaret Cope, Sales Manager
DESCRIPTION: Exclusive distributor of Cable Security Systems, Inc., a line of high security apartment boxes and locking systems and CATV products.

American SpliceCo Inc. (919) 247-2548
WATS(National). (800) 334-3968
PO Box 3367
Morehead, NC 28557
PERSONNEL: Richard Brakefield, President
DESCRIPTION: Project management, engineer for all aspects of CATV construction and maintenance. Full turnkey.

American Television. (216) 425-7000
Systems Inc.
1955 Midway Dr.
Ste. C
Twinsburg, OH 44087
PERSONNEL: James McHale, President; Ron Young, Vice President; Pete Johnson, Sales Engineer
REGIONAL OFFICES: 2213 E Grandriver, Lansing, MI 48912, (517) 482-6523; Suite 400, Parkview Office Bldg., 10480 Little Patuxent Pkwy., Columbia, MD 21044.
DESCRIPTION: Consulting engineering and technical design turnkey in any area of RF distribution. From headend design to construction of SMATV systems and local area networks. Also stocking distributor for a number of CATV, MATV, broadcom and satellite TV manufacturers.

American TransComm. Inc. . . . (203) 661-7390
80 Field Point Road
Greenwich, CT 06830
PERSONNEL: Howard Hawkins, Chairman; Robert Button, President; Hubert Schlafy, Director; Richard Campbell, Vice President; Eric DiSilvestro, Sales Manager
REGIONAL OFFICES: 4250 Perimeter Park S, Suite 131, Atlanta, GA 30341, (404) 458-6540.
DESCRIPTION: Management, technical, system, equipment consultants for cable television, microwave, and telephone communications services.

American Trencher Inc. (319) 922-2981
PO Box 266
Delhi, IA 52223
PERSONNEL: Brad Schnittjer, President; Roger Schnittjer, Vice President
DESCRIPTION: Manufacturer of tactor/loader/backhoes; attachment trenchers, blades, backhoes, compactors, loaders; in several sizes.

American Uplinks Inc. (303) 567-4628
WATS(National). (800) 525-9998
WATS(State). (303) 674-8657
PO Box 699
Idaho Springs, CO 80452
PERSONNEL: Tom Sheddan, President; Aimee Sheddan, Vice President
DESCRIPTION: Transportable satellite uplinks for concerts, sporting events, news events, teleconferencing, etc. We can also provide satellite time.

American Utility (318) 487-1352
Construction Inc.
1217 Texas Avenue
PO Box 7939
Alexandria, LA 71306
PERSONNEL: Delson Ryland, President; Fred Wilkes, Vice President
DESCRIPTION: Construction of underground and aerial CATV facilities.

AmpereX®
A NORTH AMERICAN PHILIPS COMPANY

AmpereX Electronic Corp. . . . (401) 762-9000
Providence Pike
Slatersville, RI 02876
PERSONNEL: James Robinson, President; R. Carlin, Vice President/Sales; H. Hench, Product Marketing Manager
REGIONAL OFFICES: 8900 N Main St., Dayton, OH 45415, (513) 898-9577; 3000 Scott Blvd., Santa Clara, CA 95054, (408) 727-6132; 129 Morgan Dr., Norwood, MA 02062, (617) 769-6940; 3760 Cahuenga Blvd. West N., Hollywood, CA 91604, (818) 980-4212.
DESCRIPTION: CATV amplifier modules, linear wideband amplifier modules and small signal RF transistors.

Andersen Laboratories. (203) 242-0761
1280 Blue Hills Ave.
Bloomfield, CT 06002
PERSONNEL: E. Hodur, President; J. Ainley, Ad Manager
DESCRIPTION: IFF and IF Filters, VSB filters and delay lines.

Andrew Antenna Co. Ltd. (416) 668-3348
606 Beech St.
Whitby, ONT, L1N 5S2
PERSONNEL: Hugh Swain, President; Dirk deJong, Vice President; Alex Mackenzie, Business Dev. Mgr. Comm. Prod.; John Lawson, Business Dev. Mgr. Govt. Prod.
REGIONAL OFFICES: 120 Holland Ave., Suite 201, Ottawa, ONT K1Y 0X6, Canada, (613) 728-7665.
DESCRIPTION: Manufacture ESAs ranging in size from 1.2 to 12M dia in 4, 4/6 12, 12/14 GHz. Also special application ESAs as CATV units, tracking units, polar and transportable trailer units.

Andrews Tower Inc. (817) 831-1222
1420 Layton Ave.
Fort Worth, TX 76117
DESCRIPTION: Engineer, design, fabricate, deliver, install foundations and erect steel microwave communication towers for industrial microwave, educational TV, broadcast (AM/FM/TV) offshore communications, cable TV systems, special aluminum designs, system design and development, tower engineering consultant service (existing and new designs), microwave and common carrier, tower space rental (southwest) and system feasibility and appraisals. All towers are custom manufactured to customer specifications-we do not stock towers or publish price list for this reason.

ANIXTER®
COMMUNICATIONS

Anixter Comm. (312) 677-2600
4711 Golf Road
Skokie, IL 60076
PERSONNEL: John Pigott, President; John Egan, President of Communications; Gordon Halverson, Exec. Vice President-CATV Group; Chuck Krone, Manager-Broadband Products; Raymond Geraci,

Vice President/Advertising
REGIONAL OFFICES: 4303 Pleasantdale Road, Atlanta, GA 30340, (800) 282-8928; 1620 Crosby Road, Ste. 115, Carrolltown, TX 75006, (214) 446-7337; 1301 Morse Ave., Elk Grove Village, IL 60007, (312) 364-7000; 4905 E. Hunter Ave., Anaheim, CA 92805, (714) 779-0500; 312 Richard Mine Road, Wharton, NJ 07885, (201) 328-0980; 4650 Lake Forest Dr., Blue Ash, OH 45242, (513) 733-9100; 14402 E. 33rd Pl., Aurora, CO 80011, (303) 373-9200; 1125 Orca, Anchorage, AK 99501, (907) 274 8525; 4 Marway Circle, Rochester, NY 14642, (716) 426-3440; 9201 King Palm Dr., Tampa, FL 33619, (813) 626-7115.
DESCRIPTION: Complete line of cable TV products including aerial construction materials, connectors, descramblers, underground construction materials, subscriber materials, satellite receiving antennas, converters and pay-TV products, headend distribution, and passive coaxial cable, tools and safety equipment and splicing materials. Anixter also provides materials management services to the CATV industry.

Anixter-Tele-Wire. (516) 293-7788
WATS(National). (800) 645-9510
7 Michael Ave.
East Farmingdale, NY 11735
REGIONAL OFFICES: 701B Stephonson Ave., Iron Mountain, MI 49801, (906) 774-4111.
DESCRIPTION: Full line stocking distributor to the telecommunications industry. Including satellite electronics C- and Ku-band, uplink and downlinks. Headend electronics, pole line hardware, distribution electronics, system passives, wire and cable, underground material, drop material, safety equipment, tools, test equipment, MDU equipment. Broadband LAN system equipment. In business since 1946. Contact one of our regional service centers.

Antenna Development. (314) 686-1484
& Manufacturing
WATS(National). (314) 785-5988
PO Box 1178
Poplar Bluff, MO 63901
PERSONNEL: James Gowen, President; Pat Rains, Advertising Mgr./Accountant
DESCRIPTION: Manufacturer and distributor of antennas.

Antenna For Comm. Inc. (904) 687-4121
334 Cypress Road
Ocala, FL 32672
PERSONNEL: William Drouillard, General Manager
DESCRIPTION: Commercial antennas.

Antenna Technology Corp. (602) 264-7275
1140 E. Greenway St.
Mesa, AZ 85203
PERSONNEL: Gary Hatch, President; Scott Grone, Vice President; Charles Willman, Marketing Director
DESCRIPTION: Manufacturer of the simulsat multi-beam antenna in 3.3m, 5m and 7m, (capable of receiving 30 satellites simultaneously) versions and parabolic antennas from 1.2m to 32m in assorted sizes. Distributors of over 200 satellite and cable related products worldwide. Complete turnkey satellite headend engineering, installation crews and NMDS system design.

Antronix Inc. (201) 251-6482
#2 Tenth Ave.
Monroe Township
Spotswood, NJ 08884
PERSONNEL: Dan Tang, President
REGIONAL OFFICES: Gedi Park, English Town, NJ 07726 (201) 446-2626
DESCRIPTION: CATV set-top converter, block converter, PAY TV, decoders, descramblers, amplifiers, outdoor multi-taps, splitters, matching transformers, attenuator pad, AB switch, wall, plate, connectors, grounding blocks, pole-line

Antsco Corp .

Hardware, apartment house amplifier (U/V/FM), and other CATV, MATV, MDS active and passive devices.

Antsco Corp. (818) 355-2510
 17 W Sierra Madre Blvd.
 PO Box 188
 Sierra Madre, CA 91024
 PERSONNEL: Ed Rambeau, President/Sales Manager; A. Braun, Vice President
 DESCRIPTION: Suppliers for MATV-CATV equipment; satellite TV terrestrial interference filters and traps.



Applied Instruments. (317) 782-4331
 51 S. 16th St.
 Beech Grove, IN 46107
 PERSONNEL: Doyle Haywood, President
 DESCRIPTION: Manufacturer of broadband LAN and CATV instrumentation products. Families include multi-carrier signal generators, remotely operated RF switches, and path-loss analysis systems.

Arena Systems Inc. (215) 630-0320
 2118 W Main St.
 Norristown, PA 19403
 DESCRIPTION: Repair of CATV converters, headend equipment, line equipment. Buy and sell new and used CATV converters. Addressable converters serviced.

Armex Cable Corp. (313) 755-2030
 2700 E Nine Mile
 Warren, MI 48091
 PERSONNEL: Frank Day, President; William Orley, Vice President/Sales Manager
 DESCRIPTION: Manufacturer of coaxial cable connectors. Distributor of drop hardware and drop cable.

Armorcast. (714) 630-7500
 2900 E LaJolla Road
 Anaheim, CA 92806
 DESCRIPTION: Manufacturer and distributor of conduit, bends, pedestals, apt. boxes, vaults and molding.



Arrow Fastener Co. Inc. (201) 843-6900
 271 Mayhill St.
 Saddlebrook, NJ 07662
 PERSONNEL: Allan Abrams, President; Barry Knispel, Vice President
 DESCRIPTION: Stapling machines, consisting of staple guns, hammer tackers, plier-type staplers, desk staplers, and staples, fastening system, glue guns, rivet tools.

Atlantic Research Corp. (703) 642-4000
 5390 Cherokee Ave.
 Alexandria, VA 22312
 PERSONNEL: William Borten, President; W. Hamm, Executive Vice President

DESCRIPTION: Provides consulting on franchise specifications, system evaluation, upgrade and rebuild advice, installation evaluation and management, dial access and super band system engineering, site selection, utilities signals and encryption, security systems and special measurement programs, FCC radiation standards and electromagnetic interference and compatibility analysis.

Augat Broadband. (305) 747-5000
 Engineering Inc.
 WATS(National). (800) 327-6690
 1311 Commerce Lane
 Jupiter, FL 33458
 PERSONNEL: Bill Ellis, President; Chuck Wise, Vice President/Engineering; Sherwood Hawley, National Sales Mgr.; Richard Trivison, Operations Manager

DESCRIPTION: Manufacturer of a full line of one and two-way house drop and apartment amplifiers and trunk amplifiers for CATV systems. Also manufactures a line of one and two-way data amplifiers. The leading manufacturer of replacement electronics for upgrading CATV system performance. CATV industries largest independent supplier of replacement components.

Augat/LRC. (206) 223-1110
 Augat/Broadband
 1111 Third Ave.
 PO Box 1110
 Seattle, WA 98111
 PERSONNEL: Ronald Tarrant, Group Vice President; Randy Noland, Director of Marketing, Telzon; Bill Jensen, Western Area Sales Manager; Christopher Sirianni, Eastern Area Sales Manager
 DESCRIPTION: Manufacturer of fiber-optic connectors and associated items; also data links and cable assemblies.

Authorized Parts Co. (312) 658-6900
 200 Berg St.
 Algonquin, IL 60102
 PERSONNEL: Bob Brannam, Midwest Sales; Jerry LaFountain, East Coast Sales
 REGIONAL OFFICES: 146 Berrett St., Schenectady, NY 12301, (518) 374-1113.
 DESCRIPTION: Supply converter repair parts and equipment, for Jerrold, Jerrold addressable, Hamlin, Oak and others. We also buy and sell inventory.

Auto-Gen Electric/. (318) 377-0844
 Division Mercantile Mfg.
 316 Dennis Dr.
 PO Box 895
 Minden, LA 71058
 PERSONNEL: Robert Vaughan, President; E. Vickers, Vice President; Carl McDonald, Sales Manager
 DESCRIPTION: Manufacture portable generators, standby generators, voltage regulator, diesel gensets, for the cable TV industry.

Automation Techniques. (918) 836-2584
 Licensed
 1539 105th E Ave.
 Tulsa, OK 74116
 PERSONNEL: Denise Thompson, Marketing Director
 DESCRIPTION: Manufactures a complete line of satellite receivers and systems for the cable and TVRO industries.

Available Plastics Inc. (205) 859-4957
 5020 Beechmont Dr.
 Huntsville, AL 35811
 PERSONNEL: Louis Brown, President; Ken Brown, Vice President; Steve Brown, Sales Manager
 DESCRIPTION: Manufacturer and supplier of plastic components for underground cable installations including conduit, sweeps, couplings, caps, plugs, cement trailerpark pedestals and pulling lubricant.

SAFE! FAST! EFFICIENT!



**WIRE & CABLE
 STAPLE
 GUN
 TACKERS**

**FIT RIGHT IN
 for doing the CATV
 installation job RIGHT!**



**4 Models Fit
 All Wires and Cables
 Ranging From 3/16" to 1/2" in Diameter.**



**Call your supplier or
 write for catalog & prices.**

**271 Mayhill Street
 Saddle Brook
 New Jersey 07662**

Avantek Inc. (916) 985-1201
T.M.A. Division
180 Blue Ravine Road
Folsom, CA 95630
PERSONNEL: Dr. Brigham, President; Russ Anderson, Sales Manager; Dick Anthony, Marketing Manager
DESCRIPTION: Manufactures solid-state components and amplifiers, commercial LNA's and microwave radio power amplifier retrofits.

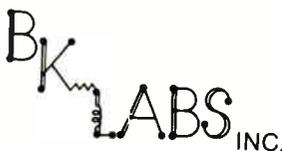
Avtec Industries Inc. (201) 882-9460
5 Audrey Place
Fairfield, NJ 07006
PERSONNEL: James Gore, President; Sy Miller, Vice President; Richard Wright, Sales Manager
DESCRIPTION: Avtec designs, engineers, fabricates and installs services. Turnkey audio visual communication systems equipment sales specializing in industrial video projection systems and other specialized communications equipment. Manufactures unique boardroom teleconferencing systems.

Axon Computer Software Ltd. (604) 294-9811
PO Box 58250 Station L
Vancouver, BC V6P 6E4
PERSONNEL: H. Horsman, President
DESCRIPTION: K-bil, a subscriber system for cable television, is a comprehensive computer system that provides flexible billing, installation and repair order processing, delinquency analysis and follow-up, and detailed earned and unearned revenue analysis. The system features subscriber look-up by name, partial name, address, account number, drop number and order number.

B & W CATV Construction. (815) 498-3505
730 Mrytle Court
Sandwich, IL 60548
PERSONNEL: Bruce Barragree, Partner; Jim Watson, Partner
DESCRIPTION: Construct cable TV systems.

B E & K Comm. Inc. (501) 853-8387
WATS(National). (800) 643-5616
210 E. Lincoln St.
Hamburg, AR 71646
PERSONNEL: Billy Jones, President; Dean Hill, Vice President; Allan Ledger, Operations
REGIONAL OFFICES: Fresno, CA, Dave Southwick, (209) 275-7005; Washington DC, Mark Johnson, (703) 849-1733; Atlanta, GA, Carl Crutchfield, (404) 284-0111.
DESCRIPTION: Full line cable television and fiber optics construction, engineering, consulting and efficiency surveys.

B-Line Construction. (704) 649-2853
75 Ammons Branch Road
Marshall, NC 28753
PERSONNEL: Bobby Ballard, Owner
DESCRIPTION: Installation of underground cable television, buried house drops and aerial house drops. Also do system audits, trap installation, weather proof (drop connectors), underground horizontal boring (any size).



BK Labs, Inc. (714) 894-4499
7231 Garden Grove Blvd.
Ste. E
Garden Grove, CA 92641
PERSONNEL: Dale Bock, President; Jeannie

Bock, Vice President; Carl Lekawski, Purchasing Agent
DESCRIPTION: Full service CATV/MATV electronics repair on studio equipment, VCR, line equipment, test equipment, headend equipment, converters, Alpha Technologies Power Supplies (authorized warranty repairs) and Hughes Klystron Power Supplies repair (including MOD B upgrades).

Baltimore Cable. (301) 347-1105
Supply, Inc.
2901 Druid Park Drive #404
Baltimore, MD 21215
PERSONNEL: Calvin Wofford, President; William Parker Jr., Vice President
DESCRIPTION: MBE. Supplier of CATV products and accessories; coaxial cable, pole line hardware, drop material, tools and safety equipment. We fulfill all your CATV needs.

Barker CATV Construction Inc. (817) 295-0454
145 N Wilson
Burleson, TX 76028
PERSONNEL: James Barker, President
DESCRIPTION: Offers CATV construction. Includes: system activation, sweep and proof of performance, and total turnkey construction service. Electronic up-grade.



BELDEN

Belden Wire and Cable. (317) 983-5200
PO Box 1980
Richmond, IN 47375
PERSONNEL: Roger Cornett, President; Bill Donahoe, Sales Manager; Ron Stier, Director of Marketing
REGIONAL OFFICES: 530 Boston Turnpike, Shrewsbury, MA 01545, (617) 845-5000; 2955 E. Main St., Ste. 300, Irvine, CA 92714, (714) 474-1200; 2625 W. Butterfield Road, Ste. 108E, Oak Brook, IL 60521, (312) 574-0800; 14651 N. Dallas Pkwy., Ste. 144, Dallas, TX 75240, (214) 788-4300; 2175 Parklake Dr., Ste. 120, Atlanta, GA 30345, (404) 934-6767.
DESCRIPTION: Complete line of coaxial drop cables for the CATV industry.

Belmont Satellite. (512) 875-9211
Highway 183 North
Luling, TX 78648
PERSONNEL: David Moore, President; Stanley Biggs, General Manager
DESCRIPTION: Sales and construction of major brand equipment. Examples: Stardish, Chaparrel, DX, Triple Crown, Cadco, Jerrold, General Instrument and Norsat.

Benner-Nawman Inc. (707) 746-0500
WATS(National). (800) 851-4043
3070 Bay Vista Court A-1
Benicia, CA 94510
PERSONNEL: William McKenna, President; E. Kientz, Vice President; J. Keely Sales Manager
REGIONAL OFFICES: Lon Brown, Customer Service, PO Box MM, Wickenburg, AZ 85358, (602) 684-2813, (800) 528-5502; Edward Criss, 1316 Sumar Road, Birmingham, AL 35213, (205) 591-1459; Todd Duvall, 12260 Herold Dr., N. Huntingdon, PA 15642, (412) 864-0414; Jeffery Jarvella, 4635 Nerven St., The Colony, TX 75056, (214) 370-4411; Cassio Maynardes, 195 Claremont

0533; Frank Reilly, 517 Pinewood Lane, Los Gatos, CA 95030, (408) 374-4933; Jon Parks, 260 Manning Road, #30, Marietta, GA 30064, (404) 422-1114; Bruce Pelton, 12375 S.E. Main, Portland, OR 97233, (503) 254-6447; Rob Richardson, 8G Wildwood Lane, Bolingbrook, IL 60439, (312) 759-3313; Michael Roland, Eastern Reg'l. Sales Mgr., 210 N. Sleight, Naperville, IL 60540, (312) 355-6777; Clyde Ruby, 100-10 Westridge Crescent, Spruce Grove, Alberta, T7X 1R5, (403) 962-6857; Michael Seaton, Customer Service, Van Tran Ave., Vandalia, IL 62471, (618) 283-4440, (800) 851-4043, Philip Scudder, Western Reg'l. Sales Mgr., 95 Navajo Trail, Pine, CO 80470, (303) 838-4758; Joe Windishman, 310 N. Greene Ave., Lindenhurst, NY 11757, (516) 884-6684.

DESCRIPTION: Benner-Nawman manufactures termination and distribution service cabinets and speciality tools. These products are sold through national CATV distributors.

Beta Tech Engineering. (602) 266-9389
4128 N 27th Ave.
Phoenix, AZ 85017
PERSONNEL: James Monroe, President
DESCRIPTION: Electrical equipment repair. CATV, MATV, SMATV, Audio, video and TV equipment repairs. MCE equipment sales - new and reconditioned. Purchase and sale of used CATV equipment.

Bethlehem Tower Works. (501) 426-5244
WATS(National). (800) 551-0025
Rt #1
Box 220-AA
Omaha, AR 72662
PERSONNEL: Bud Morrow, Owner
DESCRIPTION: Manufacturers and erectors of broadcast, CATV, microwave and cellular telephone towers and associated products.

Biddle Instruments. (215) 646-9200
510 Township Line Road
Blue Bell, PA 19422
PERSONNEL: R.E. Voeks, Advertising Manager
DESCRIPTION: New hand-held time domain reflectometer (TDR) cable fault locator, and standard digital TDR radar cable test sets, both useful for detecting defective connectors, kinks and bends—also return loss, attenuation loss and impedance mis-matches which can be calculated or read directly from a millirho/division scale. On control cables, the test sets will locate shorts, opens, taps, connectors, water in cable, and impedance mis-matches. In low end range, test sets use pulse width of only 2 nanoseconds to provide a resolution of less than 1 inch. Standard features include battery with built-in charger, built-in memory and padded carrying case.



Cable Construction, Inc.

Bigham Cable Construction Inc. (904) 932-6869
PO Box 903
Gulf Breeze, FL 32561
PERSONNEL: Harold Bigham, President; Herb Biddle, Vice President
REGIONAL OFFICES: 738 NW Renfro, Burleson, TX 76028, (817) 447-1960.
DESCRIPTION: Need your system rebuilt, upgraded, or new build, call: Bigham Cable Construction, Inc.

Birchwind Infosystems Ltd. . . . (519) 925-3897
RR4
Shelburne, ONT, L0N 1S0

Biro Engineering

PERSONNEL: Keith Thompson, President
DESCRIPTION: Birchwind offers a number of data processing services. These include cable TV billing and A/R software, service bureau operations, systems consulting, records management, automated document image storage and retrieval.

Biro Engineering. (609) 883-9866
 Box 2175

Princeton, NJ 08543

PERSONNEL: Steven I. Biro, President; Judith Biro, Vice President

DESCRIPTION: Consulting engineers for the CATV industry, performing engineering appraisals of CATV systems, annual FCC proof of performance tests and measurements, TVRO installation proofs and troubleshooting, on-site terrestrial microwave interference measurements and small earth-station placement, off-air TV signal surveys, computerized FM frequency coordination studies, computer printed, computer calculated antenna-array designs.



Blonder-Tongue. (201) 679-4000
Laboratories Inc.

One Jake Brown Road
 Old Bridge, NJ 08857

PERSONNEL: Isaac Blonder, Chairman of the Board; Ben Tongue, President; Daniel Altieri, Vice President; Glenn Tongue, Vice President; Glenn Stawicki, Regional Sales Manager
DESCRIPTION: Full line of pre-fabricated headends, antennas, downconverters, earth station receivers, low noise amplifiers, channel converters, modulators, demodulators, power supplies, off-premise systems, scramblers, encoders, audio processors, signal processors.

Bogner Broadcast. (516) 997-7800
 Equipment Corp.

603 Cantiague Rock Road
 Westbury, NY 11590

PERSONNEL: Leonard King, President; Steven Weinstein, Director of Marketing
DESCRIPTION: Manufacturers of MDS, MMDS transmit antennas (2150-2163, 2500-2690 MHz).

Bond Associates. (214) 423-4935
 3801 E. 14th St.

#602
 Plano, TX 75074

PERSONNEL: Robert Bond
DESCRIPTION: Technical consultants.
 Applications, field measurements. FM, TV, ITFS, MMDS.

Border Cable. (915) 581-9724
 Construction Co.

730 Montclair Dr.
 El Paso, TX 79932

PERSONNEL: Michael Harris Jr., Owner; Joann Harris, Co-owner
DESCRIPTION: Complete CATV and telephone construction, aerial and underground. Rebuilds, make-ready and wreck-out. SMATV construction, operation, and management. Manufacturing of specialized tools for CATV construction - cable trailer reel brakes.

Borson Larry Co.. (213) 697-6852
 9461 Canfield Dr.

La Habra, CA 90631

PERSONNEL: Larry Borson, President
DESCRIPTION: Repair general machine cable lashers. Distribute aerial construction tools and

Bose Associates Inc.. (609) 429-3170
 422 Lavender Hill Dr.

Cherry Hill, NJ 08003

PERSONNEL: Swapan Bose, President; D. Guha, Vice President

DESCRIPTION: Engineering and management services for the CATV and SMATV industry.



Brad Cable. (518) 382-8000
Electronics Inc.

WATS(National). (800) 382-BRAD
 1023 State St.

PO Box 739
 Schenectady, NY 12301

PERSONNEL: Ben Price, President; Robert Price, Senior Vice President; Richard Koonz, National Sales Manager

REGIONAL OFFICES: 4630 Pacific Hwy. East, Ste. B-7, Fife, WA 98424, (206) 922-9011; 122 E. Ellen St., Fenton, MI 48430, (313) 750-9341; 1255 Boston Ave., W Columbia, SC 29169, (803) 794-3910; 5906 Breckenridge Pkwy., Tampa, FL 33610, (813) 623-1721; Old Socco Road, Hwy. 19, Cherokee, NC 28719, (704) 493-5314; 2010 Pine Ter, Sarasota, FL 33581, (813) 921-1551.

DESCRIPTION: Sell new, used and rebuilt converters, converter parts and CATV parts. Service CATV equipment, converters, line amps, headend gear, field strength meters and related items. Jerrold Factory Qualified Service Center. Oak Factory Authorized Service Center. Brad Cable also manufactures and sells the CAT (Computer Aid Test) and Pole Cat Systems.

Brad/RF/Superior (813) 922-1551
 2010 Pine Terrace

Sarasota, FL 33581

PERSONNEL: Dewayne Lipp, Vice President/
 Engineering

DESCRIPTION: Brad RF/Superior manufactures and distributes computerized test systems for CATV headends and line amplifiers. The CAT System monitors signal levels, frequencies of modulated carriers and temperature.



Broadband Engineering Inc.. . . (305) 747-5000
WATS(National). (800) 327-6690

1311 Commerce Lane
 Jupiter, FL 33458

PERSONNEL: William Ellis, President; Chuck Wise, Vice President/Engineering; Sherwood Hawley, National Sales Manager; Richard Trivison, Operations Manager

DESCRIPTION: Manufacturer of apartment and house drop amplifiers, trunk amplifiers, headend amplifiers, line extenders, data network amplifiers. Replacement electronics for upgrading existing systems. Distributor of CATV replacement components.

Budco Inc.. (918) 252-3420
 WATS(National). (800) 331-2246

PO Box 3065
 Tulsa, OK 74101

PERSONNEL: David Allen, Sales Manager
DESCRIPTION: Taplocks, single digit tags, panel tags, marking and identification products, barrel locks and retrofitting devices. Distributor for Lemco Tools, Multilink and the W.H.

Brady Company.
 Burkeen Manufacturing Co.. . . (601) 895-4150
 WATS(National). (800) 647-9824

11200 High Point Cove
 Olive Branch, MS 38654

PERSONNEL: Jim Burkeen, President; Betty Burkeen, Vice President; Charles Skaggs, General Manager; Jim Coleman, Sales Manager

DESCRIPTION: B-30 cable plow, trencher and borer attachments, trailers, plow blades and boring accessories.



Burnup & Sims. (303) 694-6446
Cable Products Group

8000 E. Prentice Ave.
 Ste. C5

Englewood, CO 80111

PERSONNEL: Nick Caporella, President; Kevin Lynch, Vice President/GM Capscan; Mike Filkins, Vice President/GM Lectro; Steve Wagner, Vice President/Sales & Marketing

REGIONAL OFFICES: PO Box 216, Channing, MI 49815, (906) 542-6231; 371 Highcrest Dr., Milford, NJ 07480, (201) 838-8178, 8392 Tulipwood Circle, Westminster, CA 92683, (714) 893-1217; 1235 Tollard Stage Road, Tolland, CT 06084, (203) 875-8805; 507 N. Mesquite, Olathe, KS 66061, (913) 782-4309; 5 Lois Lane, Enfield, CT 06082, (203) 741-2847; 8638 Le Berthon, Sunland, CA 91040, (818) 353-6625; PO Box 826, Merrifield, VA 22116, (703) 273-5322; PO Box 36, Adelphia, NJ 07710, (800) 222-5388; PO Box 567, Athens, GA 30601, (800) 551-3790.

DESCRIPTION: Manufacturer of coaxial cable—Capscan. Manufacturer of power supplies—Lectro.



Business Systems Inc.. (803) 297-9290
WATS(National). (800) 424-0101

One Marcus Dr.
 Greenville, SC 29615

PERSONNEL: Earl Blasi, President; Bill Cox, Vice President/Sales; Russ Bosko, Vice President/Product Support

DESCRIPTION: In house, real-time computerized billing and management system featuring an interface to addressable converters and taps. Also standalone pay-per-view automation system including complete ANI interface capabilities.

Business Technologies Inc.. . . . (803) 288-0021
 WATS(National). (800) 553-8918

30 Patewood Dr.
 Ste. 301

Greenville, SC 29615

PERSONNEL: Larry Edwards, President
DESCRIPTION: Consultants for CATV.

MODULATORS YOU CAN SLEEP WITH.

We've heard horror stories about engineers who can't sleep at night because of constant equipment trouble. Well, they're probably not using CATEL equipment—because our products enjoy an industry-wide reputation for excellent performance and reliability.

Let's take our CTM20 Modulator, for example. Originally RCA's top of the line equipment, the CTM20 offers enhanced reliability, self diagnostics, additional solid state automatic switching, local and remote monitoring capabilities, as well as a built in character generator. And, because all functions can be controlled from a PC, it eliminates the time consuming hand and foot work required by other modulators.

CATEL has been providing innovative solutions to the telecommunications industry for almost 20 years. Solutions that span video, audio, and data transmission over fiber optic or coaxial cable, and microwave, satellite, or IR links.

Whether you're a small or large systems operator, you can now enjoy more capabilities and better signal quality, with less manpower and less downtime. Get a good night's sleep—contact us today to receive our new catalog, and find out more about CATEL and our new products.



CATEL

Catel Telecommunications

4050 Technology Place
Fremont, CA 94537-5122
(415) 659-8988

Call Toll Free 1/800/225-4046

Reader Service Number 23

A photograph of a white rectangular sign with a silver circular door handle on top. The sign is mounted on a door and has the text 'Please Do Not Disturb' written in a bold, black, sans-serif font. The sign is slightly tilted and is set against a yellow background.

**Please
Do Not
Disturb**

Bycom Corp.

Bycom Corp. (404) 953-8338
 150 Interstate N Pkwy.
 Suite 300
 Atlanta, GA 30339
PERSONNEL: James Kanely, President; Eddie Brooks, Vice President/Operations
REGIONAL OFFICES: 2150 W Union, Englewood, CO 80110, (303) 781-1779.
DESCRIPTION: Used CATV inventory for sale.

C & P Comm. Corp. (515) 262-5833
 3600 E 40th St.
 Des Moines, IA 50317
PERSONNEL: Chuck Ponxs, President/GM
DESCRIPTION: Residential installations, apartment pre/post wiring, specializing in highrise dwellings, internal or external, trappings, system audits, underground construction, drop bury services and drop rebuilds.



**C & S
 CONSTRUCTION, INC.**
 "Utility Contractors"

C & S Construction Inc.. (412) 935-1553
 PO Box 260
 Northgate Dr.
 Warrendale, PA 15086
PERSONNEL: William Summers, President; John Costick, Vice President; Richard Piltz, Sales Manager; Jim Scanlon, Operations Manager Netcon Div.
DESCRIPTION: Services provided for the CATV, MATV and CCTV industry. Includes aerial and underground construction, splicing and activation and performance testing. Netcon Div. specializes in local area network, broadband, baseband and fiber optic cabling and splicing. C & S Construction is also a distributor for Jerrold Electronics and cable.

C-2 Utility Contractors. (503) 741-2211
 PO Box 683
 Eugene, OR 97400
PERSONNEL: Curtis Saunders, President; M. Scott Saunders, Secretary/Treasurer
REGIONAL OFFICES: 3213 Chelton Circle, Colorado Springs, CO 80909 (303) 632-5575.
DESCRIPTION: Underground and aerial TV and telephone line installations.



**C-COR Electronics Inc.. (814) 238-2461
 WATS(National). (800) 233-2267**
 60 Decibel Road
 State College, PA 16801
PERSONNEL: Richard Perry, President/CEO; Jack Andrews, Vice President/Finance-Treasurer; Mark Robertson, Vice President/Operations & Manufacturing; John Hastings, Manager Cable TV; Arthur McGuire, Vice President/Sales & Marketing
REGIONAL OFFICES: Michael Crotts, 4938 Dana Dr., Kennesaw, GA 30144, (404) 928-6922; Jim Rushing, 555 Republic Dr., #200, Plano, TX 75074, (214) 578-0071; Dan Trayler, 7275 SW Alpine, Beaverton, OR 97005, (503) 690-1440; Fred Kummer, 509 Burgess St., Philadelphia, PA

19116, (215) 934-5654; William Margiotta, 6150 Lusk Blvd., Ste. B200, San Diego, CA 92121, (619) 576-0808.
DESCRIPTION: Designs and manufactures high-quality electronic equipment used in data communications and cable television systems. Principal products include a variety of amplifiers, status monitoring, modems, frequency translators, passives and power supplies. The company offers a variety of professional services including sales engineers, system design, field engineering, technical training, 48-hour emergency repair and 24-hour hotline.

C.S. Comm. Inc. (703) 560-0080
 2929 Eskridge Road
 Suite-P1
 Fairfax, VA 22031
PERSONNEL: Charles Sampson, President; Earl May, Sales Manager
DESCRIPTION: Engineering company doing frequency coordination, system design, engineering and economical feasibility studies and CATV and satellite system engineering services. Engineering services include computer software to the cable and TVRO industry. PC programs include subscriber management and billing systems.

CAB-LAN TEC, INC.. (805) 492-9487
 525 Gladstone Dr.
 Thousand Oaks, CA 91360
PERSONNEL: J. Larry Parsons, President; Warren A. Reihis, Vice President; Clay Koonce, Manager/ Eastern Operations; Bob Feeney, Manager/ Western Operations
REGIONAL OFFICES: Eastern Operation., Route 45, Gateway Center, Westville, NJ 08093, (609) 742-0776; Western Operation.: 9713 Lurline Ave., Chatsworth, CA 91311, (818)341-8311.
DESCRIPTION: Full service modification and repair of all manufacturer's CATV/SMATV/LAN equipment including headend, distribution, test equipment, primary and standby power supplies, converters and descramblers (Including Zenith and Jerrold Addressable). Authorized to repair Catel, Texscan and RCA products.



CADCO Inc.. (214) 271-3651
 2706 National Circle
 Garland, TX 75041
PERSONNEL: W Barnhart, President; Jeanette Magee, Vice President; Bill Smith, Vice President/ Marketing; Clayton McIntire, Vice President/ Manufacturing
DESCRIPTION: Manufacturer of headend equipment for both CATV and SMATV, antennas, emergency warning systems, LAN translators and modulators, and MDU headends.

CALAN Inc. (717) 828-2356
 RR#1 Box 86T
 Kingsman Ferry, PA 18328
PERSONNEL: Phyllis Thompson, Sales Manager
DESCRIPTION: Manufacture 600 MHz non-interfering systems sweep and spectrum analyzer.

CAM Industries. (717) 637-5988
 215 Philadelphia St.
 Hanover, PA 17331
PERSONNEL: C.A. McGough Jr., President; C.A. McGough III, Sales and Service
DESCRIPTION: Provide electric motor - shop repair equipment. Manufacturer of truck mounted aerial ladders and aerial lifts.

CAN-AM. (714) 988-5507
 Construction Inc.
 1265 W Brooks St.
 PO Box 1532
 Ontario, CA 91762
PERSONNEL: Ronald Pierce, President; Keith McCartney, Vice President
DESCRIPTION: Complete aerial and underground construction.

CASAT Technology Inc.. (603) 880-1833
 6 Northern Blvd.
 Unit 5
 Amherst, NH 03031
PERSONNEL: Hong Yu, President; Sai Kwok, Vice President
DESCRIPTION: CASAT Technology, Inc. is an innovative telecommunications and data communications equipment manufacturer. Present products include splitters, frequency synthesized modulators, active combiners, hot standby redundancy switch, solid state A/B switches and FM stereo block converters. CASAT Technology Inc. also provides OEM subcontracts.

CATECH Co. Inc.. (303) 433-0877
 5132 W 26th Ave.
 Denver, CO 80212-1312
PERSONNEL: Dildine LyBarger, President; Linda Miller, Vice President; Steven Sebaugh, Sales Manager; Howard Ohlson, Sales Manager
REGIONAL OFFICES: 3840 Portola, Santa Cruz, CA 95062, (408) 479-9230.
DESCRIPTION: A cable TV contracting company, offering services in residential and commercial installation, construction, design and turnkey build.



CATEL. (415) 659-8988
Telecommunications
 4050 Technology Place
 Fremont, CA 94537
PERSONNEL: Frank Genochio, Vice President; Wendell Woody, Director of Sales; Ron Jones, Major Program Sales Manager
REGIONAL OFFICES: 1900 Erie, Suite 203, Kansas City, MO 64116, (816)474-4289; 4 Wheeler Terrace, Marietta, NY 13110, (315) 636-8488.
DESCRIPTION: Catel supplies multichannel FDM, bi-directional (2-way) single mode fiber optic systems; FM stereo processing system with both agile modulator and off-air processors; stereo TV transmission system with TV stereo generator and TV modulator and processors; PC controlled headend modulator system; agile TV and demodulator.

CATV AMIC Co.. (615) 359-4051
 PO Box 748
 Lewisburg, TN 37091
PERSONNEL: John Gillespie, President; Jack Gillespie, Vice President; Greg McGee, Sales Manager
DESCRIPTION: We are a cable TV contracting company specializing in door-to-door marketing, contract installs and new service roll-outs.

CATV Corp. of America. (617) 374-0553
 WATS(National). (800) 343-8234
 PO Box 87
 Atkinson, NH 03811
PERSONNEL: John Millard, President; Tom Quinlan, Sales Manager
DESCRIPTION: Cable grip brand coaxial cable connectors.

CATV Design Assoc. Inc. (512) 444-2461
 PO Box 33010
 Austin, TX 78764
 PERSONNEL: Steve Williams, President
 DESCRIPTION: Computer aided new and rebuild design, as-built mapping, strand mapping drafting services, equipment evaluations, and onsite consultations.



CATV Services Inc. (415) 651-4331
WATS(National). (800) 227-1200
WATS(State). (800) 223-3152
 2211 Warm Springs Court
 Fremont, CA 94539
 PERSONNEL: Richard Richmond, President
 DESCRIPTION: Distributor of cable TV products. Specializing in repair and sales of reconditioned electronics. Authorized west coast Wavetek sales and repair facility.

CATV Subscriber (919) 273-5553
 Services Inc.
 108 State St. #102
 Greensboro, NC 27406
 PERSONNEL: Raymond Galtelli, President; Fred Robertson, Vice President; Gerald Haisman, General Manager
 DESCRIPTION: Providing full-service capability for mapping, design/engineering, construction, marketing, installation and consultation on individual or turnkey contracts basis. Providing professional results in marketing for both new and remarket campaigns, and in both aerial and underground construction.

CE&S Collier (801) 948-5931
 Engineering & Support
 PO Box 5086
 Laytonville, MD 20379
 PERSONNEL: Richard Collier, President; Terry Collier, Vice President
 DESCRIPTION: Construction consultants specializing in design for buildability and construction supervision. Proof of performance testing. RF systems for CATV, SMATV and local area networks.

CF Towers. (812) 423-8017
 4901 N St. Joseph Ave.
 PO Box 6510
 Evansville, IN 47712
 PERSONNEL: David Schmitt, Sales Manager
 DESCRIPTION: Manufacturer of guyed and self support towers for CATV, microwave and two-way communication. All tower accessories and installation crews.

COM-TEK. (415) 785-4790
 24209 Clawiter Road
 Hayward, CA 94545
 PERSONNEL: Nick Ferolito, Owner/Sales; Russell Brown, Owner/Sales; Darrell Rance, Sales; Shelley Hammerly, Sales; Roy Cooke, Technical Manager
 REGIONAL OFFICES: 21688 SW Klickitat Court, Tualatin, OR 97062, (503) 692-6669; Regional Repair Facility, Sedalia, MO 65301, (816) 826-3011.
 DESCRIPTION: COM-TEK buys and sells new and used surplus equipment for CATV and SMATV. Also complete repair facilities. Manufacturer's representative for Standard Communications. Quality RF Services, ISS Engineering, Multi-Link, Compu-Cable, Data Transmission Devices and others.

COMPUTROL

Division of Kidde Automated Systems, Inc.
KIDDE

COMPUTROL (203) 544-9371
 15 Ethan Allen Hwy.
 Ridgefield, CT 06877-6297
 PERSONNEL: Mort Scheraga, President; Dick Wolfe, Vice President/Marketing
 DESCRIPTION: Specializing in local area network products for MAP arena in CATV, carrier band and fiber optics. Also proprietary local area network products for carrier band and fiber optics.



Cable Resources Inc.

CRV. (617) 567-1600
Cable Resources Inc.
WATS(National). (800) 752-2288
 156 Porter St.
 E. Boston, MA 02128
 PERSONNEL: Peter J. Sciafani, President; Gary Singerman, Vice President; Dennis Jansen, Sales Manager; Ed Benfey, Account Rep.; Michael J. Sciafani, Account Rep.
 REGIONAL OFFICES: 156 Porter St., E. Boston, MA 02128, (617) 567-1600; 925 Bldg. #9, Lincoln Ave., Holbrook, NY 11741, (516) 563-6333.
 DESCRIPTION: Converter and line electronics material handling equipment. Manufacturer of the Terminal Control System (TCS). Products include two lines, durables and disposables. Durables: Converter baskets, converter dollies, converter cabinets, and a complete line of basket accessories including canvas tops, canvas covers and locking bases. Disposables: Tough Totes™, a compartmented, corrugated tote for handling converters. Available in various compartment sizes to accommodate all converters. Also manufactures Ampli-Guard™, the foam shelving system to handle all makes of line electronics.



CSI Technologies. (612) 354-2081
WATS(National). (800) 428-9267
 Box 308
 100 W Central
 New London, MN 56273
 PERSONNEL: Curtis Sampson, President; Wendell Dietrich, COO; Don Carley, Sales Manager
 DESCRIPTION: CSI Technologies manufactures cable lashers, aerial plant placement equipment, data modems, and repairs and services electronic equipment.

CT CATV (203) 342-1805
 Construction & Maintenance
WATS(National). (800) 222-2079
 14 Brownstone Ave.

Portland, CT 06480
 PERSONNEL: Charles Ferrara, President/Owner; Michael Ciaburri, Vice President
 DESCRIPTION: Aerial and underground cable construction for CATV systems and telephone companies. SMATV, MATV and fiber optic installation.

CWY Electronics. (317) 448-1611
 A Region of Midwest CATV
 (See Midwest CATV)
WATS(National). (800) 428-7596
WATS(State). (800) 382-7526
 405 N Earl Ave
 PO Box 4519
 Lafayette, IN 47903
 PERSONNEL: Willaim Whiteley, President; Terry French, Vice President; Wendell Whitaker, Sales Manager
 DESCRIPTION: Manufacturer of metal products including equipment racks, security enclosures, pedestals and accessories. Distributors of electronics, mechanical components and products to the industrial cable type industries. Manufacturer's representatives for select brands regional area.

CZ Labs. (914) 268-5056
WATS(National). (800) 423-2322
 135 N. Route 9W
 PO Box 126
 Congers, NY 10920
 PERSONNEL: Harry Zipkin, Sales Engineering; Steven Zipkin, Vice President/Sales; Paul Wasdyke, National Sales Manager
 DESCRIPTION: Since 1959, CZ Labs has been a manufacturer of quality cable, connectors and miscellaneous hardware for the data communications, CATV, SMATV and other related industries. As a manufacturer, we provide quality materials at a reasonable price for distributors, and OEMS, as well as systems installers and large contractors.

Cable AdNet. (215) 296-9000
 384 Technology Dr.
 Malvern, PA 19355
 PERSONNEL: Wayne Bullock, President; Robert Bower, Senior Vice President
 DESCRIPTION: Cable AdNet is an independent turnkey operator representing over 1.8 million cable subscribers nationwide for the purpose of local, regional and national cable advertising sales. In addition, Cable AdNet provides commercial insertion equipment to the more than 110 cable systems it represents; both MSO and single system operators. Cable AdNet also provides low-cost, high quality commercial production for its advertising clients in each of the markets it represents. Cable AdNet has offices in major U.S. cities including: Philadelphia, St. Louis, San Francisco, Reno/Tahoe, Charlotte and Pittsburgh. Cable AdNet National Systems Division also represents Butte, Billings, Helena, and Bozeman, Montana; Kingston and Poughkeepsie, New York; Hannibal, Missouri; and Mattoon, Illinois.

Cable Call Corp.. (301) 363-3000
 10324 S Dolfield Road
 Owings Mills, MD 21117
 PERSONNEL: Barry Dennis, President
 DESCRIPTION: Security systems, wireless RF systems for subscribers including master receivers, transmitters and accessories, low cost turnkey program for operators, monitored and non-monitored. New low cost leasing program available for operators of CATV/MATV/DBS, satellite systems. Video signal switchers, electronic low-loss, high isolation. Stereo synthesizer, TV to stereo adapters for subscribers. Amplifiers, 10, 20 dB amplifiers including power transformers for subscribers. Also 60, 72, 111, and 140 channel tuners and converters, all wireless remote control.

Cable Comm.

Cable Comm. (404) 376-5259
 Construction, Inc.
 WATS(National). (800) 342-4103
 PO Box 1009
 Hartwell, GA 30643-1009
PERSONNEL: John Williams, Sr. President;
 John Williams, Jr., Vice President; Marie Spaulding,
 Project Manager
DESCRIPTION: A privately held, very responsive
 full service CATV technical support company
 located in Hartwell, GA. Currently, operations are
 conducted in the Southeast, however expansion
 programs are in progress which hopefully will
 result in nationwide activity. We provide aerial
 and underground construction, multi-unit prewire
 and building interconnect as well as communication
 internetting for voice, data, video and other local
 area services. Also offering a full range of
 technical services, from bench repair of outside
 plant equipment, to system sweep and analysis.
 We can provide turnkey or labor services at
 competitive prices in both rural and urban markets.

CABLE COMMUNICATIONS INC.

Cable Comm. Inc.. (312) 523-6326
 4881 S Archer
 Chicago, IL 60623
PERSONNEL: Susan Hurley, President
DESCRIPTION: CATV, residential installations,
 MDU, tap audits, fiber optics and LANS work.



Cable Constructors, Inc.

Cable Constructors Inc.. (906) 774-6621
WATS(National). (800) 338-9292
 105 Kent St.
 PO Box 190
 Iron Mountain, MI 49801
PERSONNEL: James Klungness, President; James
 Brandt, Executive Vice President; Charles Henry,
 Senior Vice President; John Jamar, Director of
 Marketing; David Sanders, Vice President/
 Engineering
REGIONAL OFFICES: 505 Charlotte Road.,
 Auburndale, FL 33823, (813) 965-2847; 149 Iroquois
 Ct., Lexington, KY 40503, (606) 278-7692.
DESCRIPTION: Complete turnkey construction,
 design, engineering and home installations.

Cable Consultants, Inc.. (404) 761-0854
 PO Box 441
 East Point, GA 30364
PERSONNEL: Gregory Bostwick, President;
 Michael Jones, Vice President; Mike Sullivan,
 Vice President; Cecil Halbert, Project Manager;
 Robert Williams, Project Engineer
DESCRIPTION: Engineering and construction
 firm serving the communications industry.
 Engineering services: design, strand mapping,
 make ready and drafting. Construction services:
 aerial construction, underground construction,
 conduit construction, fiber optic installation, multi-

unit construction, earth station and headend
 installation.



Cable Converter Service Corp.

Cable Converter (812) 829-4833
Services Corp.
 54 E Market St.
 PO Box 407
 Spencer, NJ 47460
PERSONNEL: John Wright, President
DESCRIPTION: Full service repair facility for
 CATV equipment including converters, line
 equipment and headend equipment. Repairs Oak,
 Jerrold, Scientific-Atlanta, TOCOM, RCA, Hamlin,
 Sylvania, Theta Com, Texcan, Pioneer and more.
 Sales of refurbished converters. Excellent turn
 around. Locations Nationwide. Main Office Spencer,
 NJ.

Cable Engineering Inc.. (502) 589-2848
WATS(National). (800) 626-2715
 1615 Mellwood Ave
 Louisville, KY 40206
PERSONNEL: Phillip Lacy, President; Terry
 Johnson, Vice President
DESCRIPTION: Engineering: Electronic test and
 alignment: Turn on, sweep balance, two way
 alignment, proof of performance, frequency upgrade,
 system technical evaluation for municipalities
 and/or purchasers, cumulative leakage index test
 and repair. Local area network alignment, test,
 repair, evaluation, and splicing. Engineering:
 survey: Design, strand mapping, make ready
 surveys, as-built mapping, base mapping, a full
 line of drafting and graphic services, computer
 aided design, engineering of M.D.U. and
 consultation. The company provides technical
 services to cable television and local area network
 operators, vendors, and contractors seeking to
 build or rebuild systems.

Cable Exchange, Inc.. (303) 694-6789
WATS(National). (800) 777-CBLX
 5730 E. Otero Ave.
 Englewood, CO 80112
PERSONNEL: Harold Bjorklund, President/Sales
 Manager
DESCRIPTION: Cable Exchange, Inc. is an
 equipment and services brokerage for new and
 used excess CATV, broadcast and computer
 hardware. Authorized Jerrold, Magnavox and
 Capscan distributors.

**WE BUY, SELL,
 REFURBISH &
 REPAIR CATV
 EQUIPMENT**



**THE CABLE OPERATORS CONVERTER
 STORE AND A WHOLE LOT MORE!**

CALL:

CORPORATE OFFICE OHIO 280 Cozzins St. Columbus, OH 43215 (614) 221-3131	TEXAS Sales Office 2439 NE Loop 410-#1404 San Antonio, TX 78217 (512) 650-3132	MICHIGAN Sales Office 2482 Tuson Drive-2C Drayton Plains, MI 48020 (313) 673-0818
---	---	--



Cable Link, Inc.. (614) 221-3131
 280 Cozzins St.
 Columbus, OH 43215
PERSONNEL: E. Jack Davis, President; Bill
 Holehouse, Director of Sales; Stan Smith, Account
 Executive; Vonna VanHeemst, Account Executive;
 Fritz Juskalian, Account Executive
REGIONAL OFFICES: Southwest Sales Office,
 San Antonio, TX, (512) 650-3132; Michigan Sales
 Office, Drayton Plains, MI, (313) 673-0813.
DESCRIPTION: Sales of new and refurbished

converters, distribution electronics, passive devices and hardware. Large, centrally located facility for converters, distribution electronics headend and test gear.

CABLE-LOCK CONNECTORS LIMITED

Cable Lock (416) 741-7678
Connectors, Ltd.

4272 Weston Raod
Weston, Ontario, M9L 1W9
PERSONNEL: Carl Watzek, President/General Manager
DESCRIPTION: Manufacturers of cable connectors, fittings for CATV and MATV applications.

Cable Man Inc. (601) 374-5832
PO Box 393
Biloxi, MS 39533
PERSONNEL: David Gary, President; Walter Gary, Vice President
DESCRIPTION: A cable construction aerial underground service.

Cable Management Assoc. (313) 525-1045
33455 W Warren Road
Westland, MI 48185
PERSONNEL: Dennis Fassett, President; Joan Horn, Vice President
DESCRIPTION: Government and private sector CATV technical and management consulting services. Community relations, video programming, access programming, communications and CATV system management contract services.

cable prep®

BEN HUGHES COMMUNICATION PRODUCTS CO

Cable Prep (203) 526-4337
Ben Hughes Comm. Prod. Co.

207 Middlesex Ave.
PO Box 373
Chester, CT 06412-0373
PERSONNEL: Deborah Morrow, President; David Morrow, Vice President
DESCRIPTION: Manufacturer of Cable Prep® Tools. Product line includes Hex Crimp tools, coring tools for cables sized .375 through 1.000. Stripping/coring tools for all major cables (included are CableFlex, Times Fiber, and Quantum Reach Series tools). Accessory tool items available. Products are sold through major distributors. Call or write for information.



Cable Security Systems, Inc.

Cable Security Systems, Inc. (205) 821-0745

459 N. Dean Road
PO Box 2066
Auburn, AL 36833

PERSONNEL: Curt Cope, President; Mike Springer, Sales Manager

DESCRIPTION: Manufacturers of The Beast™ and Beast II™ high security apartment boxes, designed to eliminate theft and reduce maintenance costs. Distributors of Riser Guard, audit boxes, GNB batteries, padlocks and other CATV products.



Cable Services Company Inc.

Cable Services Co. Inc. (717) 323-8518
WATS(National) (800) 233-8452
WATS(State) (800) 332-8545

2113 Marydale Ave.
Williamsport, PA 17701-1498
PERSONNEL: John Roskowski, President; George Ferguson, Vice President; Robert Brantlinger, Dir. of Marketing; Harry Wahl, Vice President/Turnkey Sales
DESCRIPTION: Complete turnkey supply and construction including pole walking, strand mapping, design, engineering and installations, both aerial and underground. Stocking distributor of all major manufacturers, plus on premise repair facility.

Cable System Survey Co. (302) 368-2436
17 Peddler's Row
Newark, DE 19702

PERSONNEL: Thomas Tetreault, President
REGIONAL OFFICES: 518 N. Main St., Tekonsha, MI 49092, (517) 767-4185.
DESCRIPTION: The company provides technical

services to cable television operators, vendors and contractors seeking to build or rebuild CATV systems. Some of the services the company provides include strand mapping, make ready surveys, as-built mapping, base map systems, a full line of drafting and graphic services, computer aided design, house counts, tap audits and other specialized technical services and/or consultations.

Cable Systems (202) 737-2306
Design Group, Inc.

1301 Pennsylvania Ave. NW #200
Washington, DC 20004
PERSONNEL: Archer Taylor, President; Jonathan Ingram, General Manager
DESCRIPTION: Computer-aided cable TV system design for both new and rebuild systems, as-built survey specialists, CableGrid 2000 and computerized drafting system, engineering and planning assistance to the telecommunications industry.

Cable TV (713) 686-6880
Installations, Inc.

5891 W 34th St.
Houston, TX 77092
PERSONNEL: Jack Martin, Sr., Chairman of the Board; John Reed, President/Sales Manager; Dana Martin, Vice President; Kenny Mrnustik, Vice President/Construction; David Pickartz, Vice President/Technical Operations
DESCRIPTION: Complete construction services including aerial construction, underground construction, splicing, drop installation, apartment wiring and complete system turnkey services.

Cable TV Contracting (816) 966-1736
9321 Fairwood Dr.

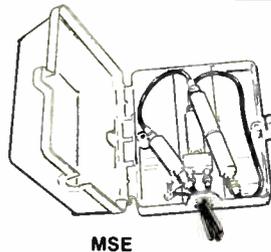
Kansas City, MO 64138
PERSONNEL: Ken Hathorn, Owner
DESCRIPTION: CATV design, splicing, activation, prewire and postwire installations. Speciality



CableTek Center PRODUCTS, INC.

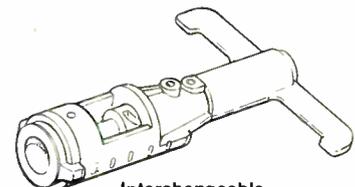
850 Taylor St., Elyria, OH 44035
(216) 365-2487
1-800-562-9378

High-Security Residential Enclosures



MSE

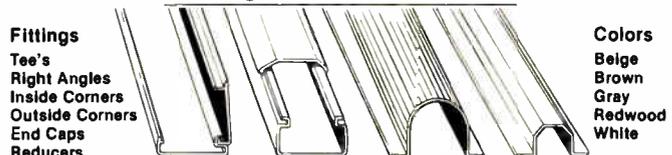
COREPREP 5 Coring & Stripping Tool



Interchangeable
Blade Sizes

.412 .500 .625 .750 .875

Molding Duct and Riser Guard



Fittings
Tee's
Right Angles
Inside Corners
Outside Corners
End Caps
Reducers

Colors
Beige
Brown
Gray
Redwood
White

Quickstall GFMD GSO GFG

Reader Service Number 58

installations and digital RF communications, training and consulting. (See also Clearvision Cable Constructors, Inc.)



Cable TV Supply Co. (213) 202-2700
5922 Bowcroft St.

Los Angeles, CA 90016
PERSONNEL: George Acker, Chairman; Mark Engler, President; William Krempasky, Vice President/Sales; Fred Bergamo, Vice President/Finance; Steve Brazil, Sales Manager
REGIONAL OFFICES: 5922 Bowcroft St., Los Angeles, CA 90016, (213) 202-2719; 1420 N. Post Oak Road, Houston, TX 77066, (713) 881-6141; 250 Gerri Lane, Addison, IL 60101, (312) 543-9800; 8060 Snowville Road, Brecksville, OH 44141, (216) 526-0919; 1610 W. Evans Ave., Unit H, Denver, CO 80110, (303) 922-4589; 5342 Morse Dr., Decatur, GA 30035, (404) 981-9220; 1200 Taylor's Lane, Unit 1A, Cinnaminson, NJ 08077, (609) 829-0100; 1110 Ave. H East, Arlington, TX 76011, (817) 640 0912; 35 Industrial Pkwy., Woburn, MA 01801, (617) 938-1221; Mole Business Park, Unit 11, Randalls Road, Leatherhead, Surrey KT227BA, England.

DESCRIPTION: Leading national supplier of virtually all products used to build and maintain cable television systems. Ships quickly from nine strategically located, computer linked distribution centers. Also supplies products, systems and support to SMATV, home satellite markets, and other communications markets through sister companies. Manufactures some products. Has sales office and warehouse in the United Kingdom.

Cable Technical Services. (512) 441-1556
3500 S Congress Ave.
Austin, TX 78704

PERSONNEL: Herb Jackson, President & Owner
DESCRIPTION: Construction and installation of cable television.



CableTek Center
PRODUCTS, INC.

Cable Tek Center (216) 365-2487
WATS(National) (800) 562-9378

850 Taylor St.
Elyria, OH 44035
PERSONNEL: Tim Reilly
DESCRIPTION: Manufacturer of security and protection installation products. CATV postwire products, coring tools, residential protection devices.



Cable Television Services. (505) 292-7766
120 Berbee NE
Albuquerque, NM 87123

PERSONNEL: Don Quinton, President
DESCRIPTION: RF converter repair facility.

Cable Terminal. (512) 258-1606
Services, Inc.

505 Cypress Creek
Cedar Park, TX 78613
PERSONNEL: Jim Orwick, Vice President/
General Manager
REGIONAL OFFICES: 3430 Fujita Ave., Torrance, CA 90505, (213) 539-8030, (800) 551-2288, Bill Ewing.

DESCRIPTION: We service converters for cable systems throughout the United States. Authorized non-warranty repair for Jerrold, Hamlin, Scientific-Atlanta and Oak converters. New repair facility now open on west coast.



CableData. (916) 636-4500
Sacramento, CA 95873

PERSONNEL: Robert Mathews, Chairman; Gerald Knapp, President; David Williams, Sr. Vice President; Maggie Wilderotter, Vice President/
Sales, Mktg. & Nat. Support
REGIONAL OFFICES: East Central: 11711 N. College Ave., Ste. 150, Carmel, IN 46032; Midwest: 770 Wood Dale Road, Wood Dale, IL 60191; Northeast: 390 Reed Road, Broomall, PA 19008; New England: 35 Braintree Hill Park, Ste. 106, Boston, MA 02184; Southeast: 3781 N.E. Expressway, #130, Atlanta, GA; West: 11020 Sun Center Dr., Rancho Cordova, CA 95670; Southwest: 4950 Keller Springs Road, Dallas, TX 75248; Canada: CableData Ltd., 140 Renfrew Dr., Markham, ONT L3R 3B3.

DESCRIPTION: CableData is a leading provider of management information systems for the cable TV industry. Complete provider of the following products and services: Software-DDP, Pay 80, CableAccountant; Hardware Tandem, QuickData; bill processing and mailing; insert printing and processing. Complete 24 hour customer support.

CableReady Inc. (303) 428-9141
6820 N Broadway
Suite E
Denver, CO 80221

PERSONNEL: Terry Fiala, General Manager; Patricia Bernitt, Administrative Asst.
DESCRIPTION: CableReady Inc. with headquarters in Denver, CO, manufactures and sells Guardian protective molding which is a 26-gauge galvanized steel molding backed by a 15-year warranty. Their molding will install in less than half the time of non-durable moldings and will stand up to the most extreme weather and vandalism. They also offer a variety of fittings for interior and exterior applications and a variety of colors. CableReady also sells direct, and their molding comes in two sizes—1' and 2' with 18 RG-6 and 45 RG-6 capacities respectively.



CableTEK. (606) 259-1366

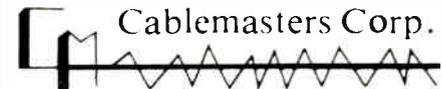
PO Box 11908
Lexington, KY 40578-1908
PERSONNEL: Bill Buntill, Chief Executive Officer; Robert Noren, Sr. Vice President; Norm Johnson, Vice President Sales
REGIONAL OFFICES: 130 Sewaren Ave., Sewaren, NJ 07077-1299.
DESCRIPTION: Computer service for the cable television industry. Both on site computers and a remote service are offered.

Cablec Corp. (914) 963-8200
Point St.

PO Box 391
Yonkers, NY 10702
PERSONNEL: Mr. Schell, President
REGIONAL OFFICES: 17 Squadron Blvd., PO Box 1100, New City, NY 10956, (914) 634-0100.
DESCRIPTION: Manufacturers of power cable.

Cablemaster Inc. (517) 694-0631
PO Box 273

Holt, MI 48842
PERSONNEL: Julian DeSmith, President; Doug Collier, Vice President; Dan Potter, Sales Manager
DESCRIPTION: Underground cable specialists and trenching, plowing and backhoeing.



Cablemasters Corp. (814) 774-2616

2184 Rice Ave.
Lake City, PA 16423
PERSONNEL: Bernie Czarnecki, President; Tom Dow, Vice President
DESCRIPTION: Aerial and underground construction services residential and MDU installations, strand mapping, make ready engineering, system design LAN networks. Turnkey available.

Cabletenna Corp. (201) 238-7660
WATS(National). (800) 468-6452

12-4 Edgeboro Road
East Brunswick, NJ 08816
PERSONNEL: C.I. Chen, President; Paul Libby, National Sales Manager; Andy Wang, Marketing Director
DESCRIPTION: Cabletenna Corp. manufactures and supplies cable converters, splitters, matching transformers and MTS stereo decoders for CATV and MATV applications.

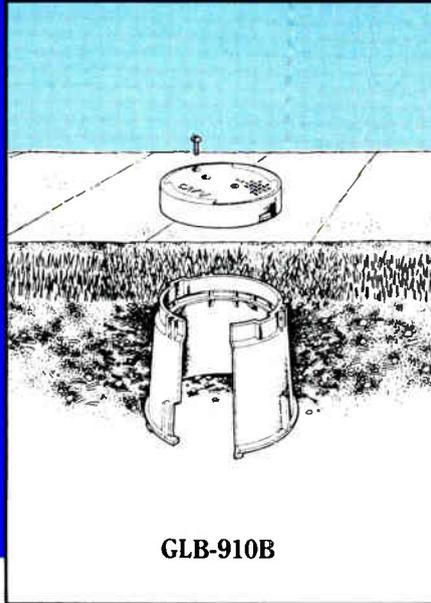
Cablevision Services Inc. (602) 833-2214
1064 S Center St.

Mesa, AZ 85202
PERSONNEL: Robert Boucher, President
REGIONAL OFFICES: 205 S Berkeley Circle, Fullerton, CA 92633, (714) 525-5184; 762 Hwy. 121, Lewisville, TX 75067, (214) 221-5714.
DESCRIPTION: Full service CATV contractor; offering the CATV industry specialization in underground construction and all phases of installation. Special emphasis on multiple dwellings.

Carson Grade Level Boxes...



GLB-1320-12B



GLB-910B



GLB-1324-15B

A great cover up for underground CATV installations!

Carson Industries, Inc., a leading manufacturer of structural foam plastic utility products has developed a full line of Grade Level Boxes (GLB) that are a great cover up for underground CATV plant.

Ideal for housing drops, passives and active splice applications, there's a Carson "GLB" designed to meet your requirements:

- GLB-608 — For housing single RG drop underground cable.
- GLB-610 — Houses multi-drop underground cables.
- GLB-1419 — Designed for use in special passive and drop applications.
- GLB-1320 — For underground drop and passive electronics applications. Also used for coax feeder and trunk cable splices.
- GLB-1324 — Available in 12" and 15" depths for housing underground single or dual passive applications, and for coax feeder and trunk cable splices.

- GLB-1730 — This box comes in either 12", 15", or 18" depths. It will house single and dual plant tap/splitter combinations, and coax trunk splices. Optional racking is also available for special below grade active equipment applications.

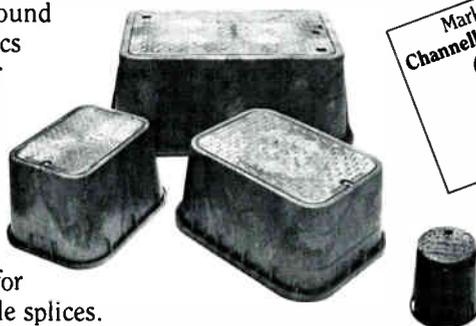
Carson GLB features include HDPE structural foam plastic; 100% stainless steel hex bolts, or optional penta and captive security bolts; available in grey or green with ultra-violet stabilizers added; box bodies tapered to eliminate ground upheaval and provide stability; CATV identification molded into covers; optional anti-skid covers

available; and hot-dipped galvanized steel bracketry available for below grade active device applications.

Carson GLBs are marketed exclusively by Channell as part of the Channell total packaging concept for underground CATV installations. They're also readily available from authorized distributors throughout North America:

Anixter
Cable TV Supply
Signal Vision

Looking for a great cover up for your underground CATV installations? Take a good look at Carson's complete line of Grade Level Boxes. For complete information, call Channell toll-free, or contact your nearest authorized Carson distributor.



Marketed exclusively by
Channell Commercial Corporation
(818) 963-1694
(800) 423-1863
(except CA)
(800) 345-3624
(in CA)

CI **CARSON INDUSTRIES INC.**

1925 "A" Street La Verne, CA 91750

Services also include system design, and turn-on balance.

California Amplifier (805) 987-9000
 WATS(National) (800) 621-4080
 460 Calle San Pablo
 Camarillo, CA 93010-8506
PERSONNEL: David Nichols, President; Dennis Schwab, Director/TVRO Div.; Barbara Marshall, Sales Administrator
DESCRIPTION: California Amplifier manufactures low noise amplifiers (LNA's), LNB's in various frequency ranges, dual LNB's which incorporate two LNB's and a dual feed in one-housing, plus a wide variety of TVRO accessories. Soon to be available are KU products.

Capscan Cable Co. (201) 462-8700
 WATS(National) (800) 222-5388
 PO Box 36
 Adelphia, NJ 07710
PERSONNEL: Kevin Lynch, Vice President-General Manager; Steve Wagner, Vice President-Sales/Marketing
REGIONAL OFFICES: 8000 E. Prentice Ave., Suite C5, Englewood Co 80111 (303) 694-6446
DESCRIPTION: Supplier of premium trunk and feeder cable and drop cable including quad-shield, RG59, RG6, and RG11.

Carlton Int'l. (817) 284-5144
 Manufacturing Corp.
 WATS(National) (800) 255-9311
 1509 Central Park Dr.
 Hurst, TX 76053
PERSONNEL: Carlton Williamson, President
DESCRIPTION: Features porta-mole underground boring equipment. A complete system for getting cable under highways, streets and other permanent fixtures.

Carolina Galvanizing Corp. . . . (919) 944-2171
 WATS(National) (800) 334-2156
 WATS(State) (800) 682-8029
 PO Box 487
 Aberdeen, NC 28315
PERSONNEL: Cary Peterson, Vice President; Bob Knorr, Division Manager; Forrest Kirk, Sales Manager
DESCRIPTION: Manufacturer of (a) copper bonded ground rods, galvanized ground rods and accessories and, (b) galvanized forged eye anchor rods, and no wrench screw anchors.

CARPENTER CABLE CONSTRUCTION

Carpenter's Cable Const. . . . (606) 598-6517
 Route 3
 Box 503B
 Manchester, KY 40962
PERSONNEL: Cartis Carpenter, Owner



Carson Ind. Inc. (714) 596-1988
 1925 A St.
 La Verne, CA 91750

PERSONNEL: Joe Bergen, President; Sheldon Jacobs, Director/Manufacturing; Bob Borello, Sales Manager
REGIONAL OFFICES: Represented exclusively by Channell Commercial Corp: (818) 963-1694, In California: (800) 345-3624, Except California: (800) 423-1863.
DESCRIPTION: Carson Industries, Inc. offers a complete line of high quality grade level boxes and vaults. Carson vaults are designed to house CATV equipment in flush-to-grade applications.

Cavision Comm. (513) 667-4416
 PO Box 308
 Tipp City, OH 45371
PERSONNEL: John Gaston, President; Craig Gaston, Vice President; Andy Ruffin, Vice President/Aerial Const.; Doug Brown, Vice President Lan & Multi Dwelling; Frank Harkelroad, Vice President Underground Const.
DESCRIPTION: Complete CATV contractors; aerial and underground construction, strand mapping and design, and installation of resident multiple dwelling units.

Cecon, Inc. (814) 445-8921
 PO Box 125
 Berlin, PA 15530
PERSONNEL: Alan Charlton, President
DESCRIPTION: Builders of cable TV and telephone systems. Services include drop installations, balancing and engineering, underground and aerial construction, make-ready and strand mapping.



Channel Master (919) 934-9711
 Industrial Park Dr.
 Smithfield, NC 27577
PERSONNEL: Sylvester Herlihy, President; Richard Deutsch, Vice President; Donald Berg, Vice President; Jim Crownover, Sales Manager/Micro-Beam; David Waddington, Sales Manager/National
DESCRIPTION: Manufacturers of Micro-Beam™ CARS-band multichannel microwave relay systems. Assistance with path feasibility studies, FCC compliance, path alignment and installation provided for clients. Also manufacturers for CATV satellite headend gear, including dishes, receivers, modulators, combiners, etc., as well as distribution equipment including wall taps, cable, connectors, directional couplers, apartment and house-drop amplifiers, a complete line of MATV equipment and tools.

Channel One Video Corp. (604) 421-2288
 2965 Bainbridge Ave.
 Burnaby, BC Canada, V5A 2S9
PERSONNEL: Peter Van Der Gracht, President; Jerry Clarke-Ames, Sales Manager; Todd Carter, Marketing Manager; Calvin Corbett, Sales Rep; Sid Copido, Sales Rep
DESCRIPTION: Channel One is a leading distributor to the cable television industry and a pioneer in CATV supply. We are committed to supplying the highest quality products and service. With four engineering technologists on staff and a technically trained sales team dedicated to excellent service, Channel One can supply all your needs in service, equipment and repair.

Channel One, Inc. (617) 969-1113
 23 Farwell St.
 Newton, MA 02160

PERSONNEL: Fred Hopengarten, President; Norman Priebsch, Vice President
DESCRIPTION: Retrofit motorization kit for Microdyne 5 meter antennas and Prodelin 4.6/5 meter antennas. VideoCipher compatibility kits for Microwave Associates, VR series satellite receivers (VR-3X, VR-3XT and VR-4Xs).

Channell Commercial Corp. . . . (818) 963-1694
 WATS(National) (800) 423-1863
 WATS(State) (800) 345-3624
 620 W Foothill Blvd.
 Glendora, CA 91740
PERSONNEL: William Channell Sr., President; William Channell Jr., Vice President
DESCRIPTION: Channell Commercial Corp. manufactures a broad line of above and below grade plastic enclosures for underground CATV plant. Channell Commercial Corp. is also the exclusive representative for Integral Corp. CABLECON® cable-in conduit and Carson Industries grade level boxes.



Channelmatic Inc. (619) 445-2691
WATS(National) (800) 231-1618
 821 Tavern Road
 Alpine, CA 92001
PERSONNEL: Bill Killion, President; Tom Walsh, Executive Vice President; Roger Heidenreich, Sales Manager
REGIONAL OFFICES: 5200 Chicago Ave., Ste. F-4, Riverside, CA 92507, (714) 686-8020; 1356 S St., Castle Rock, CO 80104, (303) 688-8777; 549 Park Ave., Prairie Du Sac, WI 53578, (608) 643-2445; 6161 N. Memorial Hwy., #1515, Tampa, FL 33615, (813) 884-0103.
DESCRIPTION: Fully automatic random access and sequential VCR commercial insert systems, programmable video cassette changer and multiple VCR playback systems for local origination, various standard modules to provide video switching, machine control and signal processing for custom systems. Complete turnkey installed systems are available.

Charles Industries. (312) 398-6600
 Cable TV Division
 4902 Tollview Dr.
 Rolling Meadows, IL 60008
PERSONNEL: Joe Charles, President; Mike Hels, Vice President; Tom Kehe, Sales Manager
DESCRIPTION: Pedestals, apartment house security boxes, standard hardware and custom hardware.

Chomeric, Inc. (617) 935-4850
 77 Dragon Court
 Woburn, MA 01888
PERSONNEL: Charles Ehlers, President; Robert Rothenberg, Vice President/Dir. of Marketing; William Lionetta, Sales Manager
REGIONAL OFFICES: 16 Flagstone Dr., Hudson, NH 03051; 23839 S Banning Blvd., Carson, CA 90745.
DESCRIPTION: EMI shielding products, EMI attenuators, EMI absorbers, EMI mesh strip gasketing, conductive paints and adhesives, conductive foil adhesive tape, insulated grounding straps, EMI/RFI grounding contacts, EMI/RFI ESD flat cable shield and heat-shrinkable cable shielding.

TV EQUIPMENT MARKETPLACE

SPOTMATIC™

You Can't Buy a Better Ad Insertion System

This is the system everyone thinks of when someone asks, "What is the most widely used random access ad insertion system?"

The fact is that there are more SPOTMATIC systems in use today than any other type of ad insertion system. The reasons are simple: high quality, proven reliability, unparalleled factory support, and an unmatched array of features.

- Completely modular for easy expansion as system grows
- Interfaces with optional Ad Manager™ billing and traffic software

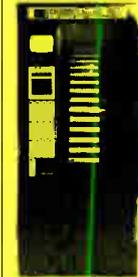


- Expandable to 32 channels with 32 VCR's inserting ads
- Full random access or random pod operation
- Front-panel keyboard or optional personal computer control
- Complete turnkey packages available
- Quick delivery
- Broadcast quality vertical interval switching
- Automatic logging with advertiser-sorted printout
- Automatic bypass of malfunctioning VCR
- Automatic return to satellite in event of VCR or power failure

Channelmatic, Inc., 821 Tavern Rd., Alpine, CA 92001. Or phone (800)231-1618 or (619)445-2691.

BROADCASTER IT™ PROGRAMMABLE VIDEOCASSETTE CHANGER

Access 15 cassettes to play in any order



- Uses one Sony VP-5000 series 3/4" VCR
- Easy to program, stores up to a full week's schedule
- Highly reliable mechanism uses no belts, chains, gears
- Suitable for broadcast, cable, industrial, educational, and government installations for any multiple-tape playback requirement

Channelmatic, Inc. 821 Tavern Rd, Alpine, CA 92001 (800)231-1618 or (619)445-2691

AD CART 2-2™

Like two systems for the price of one

A new concept in ad insertion allows low cost fully random access ad playback with one through four VCR's on one channel, two VCR's on each of two channels, or four VCR's shared between two channels. Features full stereo audio capability, preview bus, computer-adjusted audio levels, user-friendly CRT terminal interface for easy scheduling, advanced audio and video switching circuitry, front panel status display, and unlimited system expansion capability. Traffic and billing software available. Contact CHANNELMATIC, INC., 821 Tavern Rd., Alpine, CA 92001 (800)231-1618 or (619)445-2691

FREE CATALOG

Write for our brand new catalog of television and cable system equipment. Everything from automatic ad insertion to playback systems to audio and video switching to signal processing and control.

Complete product line listing with photos, block diagrams, and comprehensive descriptions and specifications. Enough detail to spec out your own custom system. Catalog will become a valuable reference. And it's yours just for the asking. Write, call, or circle the bingo number. But do it soon.

Channelmatic, Inc. 821 Tavern Rd. Alpine, CA 92001 (800)231-1618 or (619)445-2691

ARE YOU THROWING MONEY AWAY?

Losing verification data is just the same as throwing money away, and who in their right mind would do that. Make sure when you run somebody's ad you get paid for it. The LOGMATIC™ and LOGMATIC JR.™ logging and verification systems always get their data when used in a system with SPOTMATIC JR. and LIL MONEYMAKER low-cost ad insertion systems.



The LOGMATIC contains a 4000-event memory and interfaces to an 80-column printer or to a PC for data retrieval. The LOGMATIC JR. has a built-in 20-column printer and real-time clock. It prints the event record as the event occurs. Both loggers feature automatic operation, and they record insertions on four channels.

Call or write for more information. You don't have to lose money for unverified spots. Channelmatic, Inc. 821 Tavern Rd. Alpine, CA 92001. (800)231-1618 or (619)445-2691.

NETWORK SHARE SWITCHER

- Inserts ads into four networks from one ad source.
- Inserts ads one network at a time on a first come, first served basis.
- Four Digital DTMF cue tone decoders.
- Four preroll delay timers one for each network.
- Composite sync output to facilitate vertical interval switching.
- Cue tone decoder disable switches.
- Power fail relay bypass.
- Inputs and outputs for controlling ad insertion devices.



NSS-4A NETWORK SHARE SWITCHER

CHANNELMATIC, INC. 821 Tavern Rd. Alpine, CA 92001 (800)231-1618 or (619)445-2691

LIKE GETTING YOUR MONEY FOR NOTHING AND YOUR CHECKS FOR FREE

Make Money the Easy Way — Put either SPOTMATIC JR.™ or LIL MONEYMAKER™ to work for you now. They are the lowest-cost tools you can use to automatically insert local ads into cable TV programming. You have one unit controlling one VCR to put ads on one channel. Equipment overhead is very low.

Switching occurs during the vertical interval for broadcast quality transitions. Once the system is programmed by the operator, it operates automatically.

The SPOTMATIC JR. has a built-in printer for verification records; however, both the LIL MONEYMAKER and SPOTMATIC JR. inserters connect easily to a LOGMATIC™ logging and verification system. With optional software, this enables computerized data retrieval and automated billing and report generation. Write now to see just how little it takes to get into automatic ad insertion.

Channelmatic, Inc. 821 Tavern Rd., Alpine, CA 92001 (800)231-1618 or (619)445-2691

Does the high cost of monitor switchers have you behind the eightball? Then you need to

PUT AN EIGHTBALL™ UNDER YOUR MONITOR— 8x1 Very Low Cost Switcher

It is an integrated circuit-based monitor switcher featuring broadcast quality stereo audio and video switching. Lighted momentary contact pushbuttons are field-legendar. Its cost is far less than any other comparable unit on the market. Write or call for information today.



CHANNELMATIC, INC. 821 Tavern Rd. Alpine, CA 92001 (800)231-1618 or (619)445-2691

Chyron Corp.

Chyron Corp. (516) 845-2000
265 Spagnoli Road
Melville, NY 11747
PERSONNEL: Alfred Leupert, Chairman of the Board; Joseph Scheuer, President; David Buckler, Vice President/Sales; Paul Rozzini, Vice President/Manufacturing; John Poserina, Controller
DESCRIPTION: Products include Chyron IV graphics and titling systems. MGM Multimode graphics module, major system options creating special effects. Scribe-ultra high resolution text generator, chameleon stand-alone low cost paint system. RGU-2 medium priced high resolution character generator. VP1 and VP2 low cost high resolution graphics generator.

Claire Stern Assoc. Inc. (212) 532-6680
307 Fifth Ave.
New York, NY 10016
PERSONNEL: Claire Stern, President
DESCRIPTION: The Spectraview character generator with graphics capability is a low-cost, high performance information display system which has optional equipment such as disk drive storage, remote communications and low-cost weather display. Systems start below \$500. The new star titler/character generator includes graphics capability and has a Genlock/Superimpose feature which allows it to be used for titling, downstream keying as well as a graphics editor. The STAR starts at about \$2000. New product CG Plus, 640 X400 Pixel Character Generator/Titler, Color Digitizing, Graphics and Gen Lock.

ClearVision Cable. (816) 966-1736
Constructors, Inc.
9321 Fairwood Dr.
Kansas City, MO 64138
PERSONNEL: Ken Hathorn, President; Gary Dixon, Vice President
DESCRIPTION: Cable TV construction, splicing and activation. Complete construction services including aerial and underground construction turnkey services.

Clover Cable Systems. (609) 785-0078
PO Box 2246
S Vineland, NJ 08360
PERSONNEL: Joseph O'Donnell, President; Roman Rakowsky, Vice President
REGIONAL OFFICES: PO Box 43363, Las Vegas, NV 89104, (702) 384-8722.
DESCRIPTION: Engineering, design, drafting, and underground/aerial construction for the cable TV industry.

Coastal Engineered. (803) 943-4538
Products Co., Inc.
1101 Main St.
PO Box 607
Varnville, SC 29944
PERSONNEL: Ralph Deloach, President; Paul Muir, Vice President
DESCRIPTION: Manufacturer of fiberglass above and below ground pedestals, and out-of-sight closures.

Coaxial Analysts, Inc. (303) 770-7700
4582 S Ulster St. Pkwy.
Suite 1301
Denver, CO 80237
PERSONNEL: Ross McPherson, Pres./Management Svc. Div.; Jeffrey Gutfreund, Pres./Marketing Svc. Div.; James MacKenzie, Vice President/Strand Mapping
DESCRIPTION: Strand mapping and system design utilizing the Magic graphic computer system. Related services through Coaxial Construction Corp., Coaxial Capital Corp., and Videophile Inc.

Coaxial Construction Corp. (303) 770-7700
4582 S Ulster St. Pkwy.
Ste. 1301
Denver, CO 80237
PERSONNEL: George Taylor, Executive Vice President; Blake Williams, Director of Operations
DESCRIPTION: Total aerial and underground CATV construction services; stranding; cabling; splicing; activation; headends; microwave. New builds and rebuilds. Related services through Coaxial Analysts Inc., Coaxial Capital Corp., and Videophile Inc.

Cochran Comm. Const. (619) 328-6778
36-630 Cathedral Canyon Dr.
Cathedral City, CA 92234
PERSONNEL: Mike Cochran, General Manager; Greg Williams, Engineering Manager; Vicki Cochran, Office Manager
DESCRIPTION: Cochran Communications Const. is a broadband communications contractor serving the southern California area. Cochran has installed and serviced antenna, cable and satellite systems for the military and various CATV, SMATV, LAN and teleconference network companies.



Coil CATV (312) 398-6600
Products Division
4902 Tollview Dr.
Rollins Meadows, IL 60008
PERSONNEL: Joe Charles, President; Mike Hels, Vice President
DESCRIPTION: Directional taps, line splitters, directional couplers, pedestal housings, and aerial bracket. Also apartment security of boxes.

Colormax Electronic Corp. (201) 264-1296
PO Box 47
Keyport, NJ 07735
PERSONNEL: Sakae Chang, President
DESCRIPTION: Distributor of CATV, MATV, satellite and computer network accessories.

Colvins Inc. (617) 893-3900
WATS(National). (800) 343-4614
185 Prospect St.
Waltham, MA 02154
PERSONNEL: Leo LeBlanc, President; Robert LeBlanc, Vice President
DESCRIPTION: Aerial trucks, quality reconditioned trucks. Rentals daily-weekly-monthly.

ComSE Sales Corp.

ComSE Sales Corp. (404) 963-7870
641 Grayson Hwy.
Lawrenceville, GA 30245
PERSONNEL: John Weeks, President; Joe Acker, Regional Salesman; Paul Legris, Regional Salesman; Paul Williams, Regional Salesman; Ivan Jones, Regional Salesman
REGIONAL OFFICES: 317 25th St. NW, Fayette, AL 35555, (205) 932-7264; 6112 Eagles Nest Dr., Jupiter, FL 33458, (305) 747-3647; 105 Mt. Vernon

Dr., Alblemarle, NC 28001, (704) 983-5908; 2828 Venetian Garden, Gulf Breeze, FL, (904) 932-7422.
DESCRIPTION: Manufacturer's representative for Wavetek Indiana, Catel Telecommunications, Data Transmission Devices, Telecommunication Products and Quality RF Services.

Comlink Systems Inc. (416) 831-8282
Unit 5
1420 Bayly St.
Pickering, ONT, L1W 3R4
PERSONNEL: Richard Hancock, President; John Hood, Vice President; John Wilson, Vice President
DESCRIPTION: Hughes Microwave Systems, Harris TVRO and uplink systems, Andrew antenna TVRO and microwave products, (LAN), Alpha standby power and UPS systems, ITS 2.5 GHz MMDS systems, Channelmatic satellite tone decoding, commercial insertion, program substitution systems. Scientific-Atlanta satellite systems, headend equipment, data product subscriber equipment, UHF/VHS coaxial cable distribution amplifiers, Synchronous Communications, FM video, MODS/DEMOS, optical transmitters/receivers, freq. agile 1/P 0/P converters and FM audio repeaters.

Communications Construction Group Inc.

Comm. Construction Group Inc. (215) 696-1800
235 E Gay St.
PO Box 561
W Chester, PA 19380
PERSONNEL: George Tamasi, President; Thomas Polis, Executive Vice President
DESCRIPTION: Complete construction services including strand mapping, make ready, system design, aerial construction, underground construction, splicing, drop installation, apartment wiring and complete turnkey services.

GENERAL INSTRUMENT

Comm/Scope/
General Instrument (704) 324-2200
WATS(National) (800) 982-1708
PO Box 1729
Hickory, NC 28603
PERSONNEL: Frank Drendel, President; Jim Webb, Vice President/General Manager; Stan Lindsay, Vice President/Sales & Marketing
DESCRIPTION: Manufacturer of COMM/SCOPE coaxial cable-trunk and distribution and dropwire; networking cables.

Commercial Cable Inc. (CCI). . . . (615) 894-2580
7353 Lee Hwy.
Chattanooga, TN 37421
PERSONNEL: John Brady Jr., President; Richard Edison, Vice President; Rhonda Boyd, Vice President; Lynn Brady, Secretary/Treasurer
DESCRIPTION: Commercial Cable Inc. manufactures a complete line of commercial insertion equipment as well as Automated Local Origination systems. Our speciality is computer control of videotape machines with very close tolerance vertical interval switching among machines and network sources. We also feature a very dependable verification system.

Commercial Satellite Systems. . .(415) 848-4331
2955 Russel St.
Berkeley, CA 94705
PERSONNEL: Rob Hu-wich, President
DESCRIPTION: Distributes teleconferencing equipment and services, provides SMATV consulting and development, video/RF equipment service and repair, on site microwave interference analysis and field engineering services in addition to items listed above. CSS is a wholesale distributor of TVRO equipment and components.

Communications Engineering. . .(416) 676-9600
5790 Campus Road
Mississauga, ONT, L4V 1G2
PERSONNEL: Geoff Heathcote, General Manager; Nick Glas, Project Manager
DESCRIPTION: Cable television consulting engineering firm.

Compu-Trace Inc..(818) 886-3551
8803 Shirley Ave.
Northridge, CA 91324
PERSONNEL: M. Kim, President; Julie Kim, Vice President; Pad Amarasinghe, Operations Manager
DESCRIPTION: Set-top converter repair service and assembly manufacturer.



Computer Utilities.(501) 741-1616
Services/Ozarks
103 Industrial Park Unit C
PO Box 1062
Harrison, AR 72601
PERSONNEL: Herb Lair, President; John Bartlow, Vice President; Lynn Armstrong, Vice President; Jerry Criner, Vice President
DESCRIPTION: CABLE/1 Management information and accounting system for the IBM PC and IBM Series/1 (IBM Compatibles) system includes work order processing, billing, statement printing, multi-user, marketing, and history information. Accounts receivable, inventory, accounts payable, and general ledger can be integrated for a complete management system.

Comsat Technical Services.(301) 428-4258
2250 Comsat Dr.
Clarksburg, MO 20871-9499
PERSONNEL: Marcel Joseph, President; Dan Difonzo, Vice President; Keary Cannon, Sales Manager
DESCRIPTION: Satellite television networks, mobile uplinks for C-Band and Ku-Band, videoconferencing and teleseminar applications.

Comsearch Inc..(703) 620-6300
11720 Sunrise Valley Dr.
Reston, VA 22091
PERSONNEL: Teresa McDermott, Sales Representative
DESCRIPTION: Engineering services for satellite earth station, FCC licensing services, CARS band and 23 GHz serv. Interference trouble-shooting and correction.



Comsonics Inc..(703) 434-5965
WATS(National).(800) 336-9681

1350 Port Republic Road
PO Box 1106
Harrisonburg, VA 22801
PERSONNEL: Warren Braun, President; Mark Barber, Vice President/Repair Services; Glen Shomo, Vice President/Manufacturing; Dick Shimp, Vice President/Field Services; Dennis Zimmerman, Vice President/Marketing & Sales
REGIONAL OFFICES: Montreal, Quebec, Canada, (514) 322-5540.
DESCRIPTION: Signal leakage detectors, field strength meters, coaxial relays, surge protectors, line equipment repair services, headend equipment repair services, TVRO equipment repair services, test equipment repair services, field engineering services, and consulting.

Comtech Antenna Div..(305) 892-6111
3100 Communications Road
St. Cloud, FL 32769
PERSONNEL: Preston Windus Jr., President; Glenn Higgins, Vice President-GM; Tom Christy, Sales Manager
DESCRIPTION: Comtech Antenna manufactures earth station antenna systems. CATV antenna systems are available in 3.0, 3.8, 5.0 and 7.3 meters. Elevation over azimuth and polar mounts are available. Comtech also manufactures the Offset™ antenna, a two degree spacing system for transmit applications. Transportable antenna systems are also available. Multifeed systems are for the 3.8 meter and 5.0 meter are also offered by Comtech.

Condux Int'l, Inc..(507) 387-6576
Box 247
Mankato, MN 56001
PERSONNEL: W. Radichel, President; Chris Brahler Jr., Vice President/GM Condux & Vibra King Inc.
DESCRIPTION: Manufacturer of PVC conduit, cable pulling equipment and accessories, pneumatic boring tools, swivels, and pulling eyes.

Consolidated Electronic.(312) 455-8833
Wire & Cable Corp.
WATS(National).(800) 621-4278
11044 King Road
Franklin Park, IL 60131
PERSONNEL: Thomas Mann, President; Karl Rankin, Vice President/Sales; Marc Abramson, Vice President/Marketing; Steve Boynton, Sales Operations Manager
DESCRIPTION: Manufactures electronic wire, cable, cord product, cord sets, tubing and sleeving products.

Contel Business Systems.(404) 395-8760
245 Perimeter Center Pkwy.
Atlanta, GA 30346
PERSONNEL: Dave Rubin, Vice President; James Lakin, President
REGIONAL OFFICES: 130 Steamboat Road, Great Neck, NY 11024, (516) 829-5900.
DESCRIPTION: Provides CATV system design using large scale computers. Supply turnkey systems solution and consulting services, network management tools and local area network.



Contract Installers Inc..(414) 582-7087
PO Box 1564
Appleton, WI 54913

DESCRIPTION: House installations, aerial, underground and pre-wire. Apartment installations, post-wire, pre-wire and commercial building. Tap audits. Install or remove traps and/or converters. Drop change over for system rebuilds.

Control Technology Inc..(214) 272-5544
1881 State St.
Garland, TX 75042
PERSONNEL: Charles Turner, President; Jerry Graves, Vice President; Gene Faulkner, CATV Sales Manager
DESCRIPTION: Manufactures and designs standby conventional power supplies.

Conversations on Cable.(404) 237-3919
3110 Roswell Road
Ste. 218
Atlanta, GA 30305
PERSONNEL: Marcus Graham, President; Brian Shaw, Vice President; Barry Piacente, Vice President
DESCRIPTION: Provides marketing services to cable operators including customized and syndicated radio commercial packages, audio productions for callers on "hold," monthly programming/ educational newsletter for customer contact employees (CSR's, sales, installers).

Converter Parts, Inc..(518) 875-6444
PO Box 278, Rte. 20
Esperance, NY 12066
PERSONNEL: Gary Rudolph, President; Peggy Rudolph, Vice President; Rudy Moentmann, Sales Manager
DESCRIPTION: Manufactures and sells converter parts.

Cooley Assoc., Inc..(215) 752-0279
640 Valley View Road
Box 187
Langhorne, PA 19047
PERSONNEL: Caywood Cooley Jr., President; Bruce Cooley, Vice President; Isabel Cooley, Vice President
DESCRIPTION: CATV consultant. Specializing in cost efficient applications of cable, AML and optical concepts in the design of CATV system, rebuilds using proprietary computer aided design techniques. CATV software and hardware for sale or lease.

Cooper Construction Co., Inc.. . .(615) 554-3624
Star Rte. Box 87-C
Graysville, TN 37338
PERSONNEL: Lonnie Cooper, President/Sales Manager; Delila Cooper, Vice President
DESCRIPTION: Specializing in construction, aerial and underground, splicing, strand mapping, make ready.

Cooper-Rutter Assoc. Inc..(609) 596-0057
The Evesham Commons
Ste. 200, 525 Rte. #73 S, Rd.1
Marlton, NJ 08053
PERSONNEL: Edward Rutter, President; Howard Friedman, Vice President/General Counsel; Dave Bartolone, Director of Engineering
DESCRIPTION: Cable television consulting services: pro formas, appraisals, system engineering, LAN and I-Net services, refranchise strategy, ascertainment-feasibility studies, proposal preparation and system mangement.

Cottrell & House, Inc..(608) 233-9711
6300 University Ave.
Po Box 5648
Madison, WI 53705
PERSONNEL: Robert Laurion, President; John Lubniewski, CATV Manager
REGIONAL OFFICES: PO Box 110929, Nashville, TN 37211, (615) 331-9900.
DESCRIPTION: Cottrell and House, Inc. engineering and management, broadband division.

Count On Us

Outages
cost you time—
and time is money.

Data Transmission
Devices
provides an efficient,
reliable standby
power supply—
one that can be
counted on.



When the power
goes off ...

**Data
Transmission
comes on**

We keep your
system up.



**Data Transmission
Devices, Inc.**

Reader Service Number 75
65 Walnut Street,
Peabody, Massachusetts 01960

Cra-Mac Cable

Cra-Mac Cable. (919) 764-2764
Services, Inc.
PO Box 420
Welcome, NC 27374
PERSONNEL: Gary Craven, President; Martha
Craven, Vice President; Steve Stone, Vice President/
Sales Manager
DESCRIPTION: Complete construction services
for aerial and underground, apartment wiring, and
turnkey services.



Creative Management Systems, Inc.
An IBM Value Added Remarketer

**Creative Management. (201) 341-6165
Systems, Inc. (CMS)**

213 Washington St.
PO Box 10
Toms River, NJ 08754
PERSONNEL: Morris Adler, President; Richard
Alfonso, Vice President/Research & Development;
Alan Meyer, Vice President; Gil Jacobs, Vice
President/Sales & Marketing; Ron Samuel, Vice
President/Operations
REGIONAL OFFICES: 50 Francisco, Ste. 220, San
Francisco, CA 94133; Forum VI, Ste. 636-H, 3200
Northline Ave., Greensboro, NC 27408; Park 80
West, Plaza 2, Ste. 200, Saddle Brook, NJ 07662.
DESCRIPTION: CMS System 1-The easy to use,
in-house, on-line subscriber management and
billing system. System 1 automatically handles all
customer service work, prints your bills, controls
your addressable system and provides marketing
and management information in a timely manner.

Crystal Technology, Inc. (415) 856-7911
1060 E. Meadow Circle
Palo Alto, CA 94303

PERSONNEL: Zoann Snow, Sales Manager; Cheryl
Holmes, Sales Engineer
REGIONAL OFFICES: 440 Lexington St., Newton,
MA 02166, (617) 527-6589. Telex: 4930156.
DESCRIPTION: Surface acoustics wave (SAW)
filters and delay lines for CATV headends,
modulators, demodulators, converters, satellite
receivers (70 MHz and UHF) filters are small
(to-8), PC board compatible and requires no
tuning. Filters can be made from 35 to 950 MHz
to 40-45 dB rejection of outside signals.

D.E. Gerrity Assoc. (714) 960-2491
CATV Services
PO Box 3359

Huntington Beach, CA 92605
PERSONNEL: Don Gerrity, President; James
Scott, Vice President
DESCRIPTION: Post-construction contract labor
services.

D.E.L. Compu-Cable. (306) 934-6884
Systems, Inc.

#6-301-45th St. West
Saskatoon, Sask., S7L 5Z9
PERSONNEL: Dale Lemke, President; Bob
Hodgins, Sales Manager
REGIONAL OFFICES: 1906 S Broadway, Minot,
ND 58701, (306) 934-6884.

DESCRIPTION: The Spectraview character
generator with graphics capability is a low-cost,
high performance information display system
which has optional equipment such as disk drive
storage, remote communications and low-cost
weather display. Systems start below \$500. The
new star titler/character generator includes graphics
capability and has a Genlock/Superimpose feature
which allows it to be used for titling, downstream
keying as well as a graphics editor. The STAR

starts at about \$2000. New product CG Plus, 640
X400 Pixel Character Generator/Title, Color
Digitizing, Graphics and Gen Lock.

DGH Comm. Systems Ltd. (416) 499-4746
3761 Victoria Park Ave.
Suite 5

Scarborough, ONT, M1W 3S2
PERSONNEL: Derek Henry, President; Norm
Duncan, Sales Manager
REGIONAL OFFICES: 7333 Des Roseaies, Suite
100, Montreal, Quebec, H1M 2X6, Canada (514)
354-6263, Yvon Caron/Manager.
DESCRIPTION: Turnkey communication system
builders specializing in microwave links and
satellite earth stations, fiber optic and sub-carrier
systems for audio and data. Satellite and cable
RF modems.

DLM ENTERPRISES

DLM Enterprises. (404) 924-8948
PO Box 1207

Marietta, GA 30061
PERSONNEL: David Marshall, President; Robert
Connely, Vice President
DESCRIPTION: Design engineering software and
LAN construction.

DX Comm., Inc. (914) 347-4040
10 Skyline Dr.

Hawthorne, NY 10532
PERSONNEL: Hiro Sugiyama, President; Dick
Gonzalez, Vice President; Koki Matsumoto, Dir/
Commercial Products Mktg.
DESCRIPTION: Satellite receivers and down
converters, modulators for CATV/SMATV headend
systems.

Daburn Electronics. (201) 768-5400
and Cable Corp.
70 Oak St.

Norwood, NJ 07648
PERSONNEL: Howard Danziger, President; Randy
Hibshman, Sales Manager
DESCRIPTION: Daburn supplies a complete line
of wire and cable, shrink tubing, electronic
hardware, fastening devices, retractile cords,
modular cords, plugs and jacks, shielded braid,
lacing cord, insulators and test lead wire. Special
constructions are run with small minimums. Most
orders are shipped within 24 hours. A complete
line of coaxial cable is available from stock.



**Data Transmission
Devices, Inc.**

**Data Transmission. (617) 532-1884
Devices, Inc.**

65 Walnut St.
Peabody, MA 01960
PERSONNEL: Larry Burckmeyer, President; Stan
Johnson, Vice President
REGIONAL OFFICES: 1205 Thoreau Lane, Allen,
TX 75002, (214) 727-6728.
DESCRIPTION: Power supplies for CATV systems.
Single and dual cable, 12, 18, 24 amp standard and
standby. Headend power supplies. All UL listed.



DENVERUPLINK
TELEPORT INTERNATIONAL, INC.

Denver Uplink.(303) 458-7273
Teleport Int'l Inc.
2480 W 26th Ave.
Bldg. B
Denver, CO 80211
PERSONNEL: Dave Sullivan, President; Robert Ducaj, Vice President; Al Baker, Sales Manager; Nancy Stokvis, Office Manager; Don Christiansen, Chief Engineer
DESCRIPTION: Denver Uplink is a full service Teleport, currently transmitting 160 hours of video per day, serving broadcast and cable industries as well as other commercial and non-commercial businesses. Services offered: Uplinking-Multiple 11 Meter antennas (fixed and steerable), Video, Audio, Data, SCPC, Slow Scan, Fixed, Temporary and Portable Microwave Pass. 3 Telco Loops. Transponder Brokerage. On site studio, and a host of post-production services. Staffed 24 hours a day.

Devine's Machine.(717) 469-0777
& Design, Inc.
PO Box 239
Grantville, PA 17028
PERSONNEL: Joseph Devine, President; Phyllis Devine, General Manager
DESCRIPTION: Manufacturers and distributors of Devines® trailers and accessories. Also Cabeline™ tools and equipment. Distribution branch: Alcestis Distribution Company.

di di-tech

DI-Tech.(516) 667-6300
48 Jeffryn Blvd.
Deer Park, NY 11729
PERSONNEL: Tony Bolletino, Marketing Director
DESCRIPTION: Manufacturer of audio and video routing switches, audio-video distribution amplifiers, touch tone control systems, seven-day computer controller and commercial insertion equipment.

Dialogic Comm. Corp..(615) 790-2882
WATS(National).(800) 553-8505
PO Box 8
Franklin, IN 37065
PERSONNEL: Hugh Lifsey, President; Phil Sutter, National Sales Manager
DESCRIPTION: Manufactures and distributes interactive voice processing systems.

DIAMOND

Diamond Communications. . . .(201) 789-1400
Products, Inc.
500 North Ave.
Garwood, NJ 07027

PERSONNEL: Ron Pignatello, Nat. Sales Manager
Diamond Comm.; Tony DiPace, Vice President-
Sales S. River Metal Prod.; Paul Muir, Vice
President-Sales Coastal Eng. Products
REGIONAL OFFICES: Coastal Engineered
Products, 1101 Main St., Varnville, SC 29944,
(803) 943-4538.
DESCRIPTION: Manufacturers of pole line and
drop installation hardware for the
telecommunications and cable TV industries.
Enclosure division, Coastal Engineered Products,
manufactures pedestals and enclosures for the
telecommunications and cable TV industries. OEM
stamping, wire forming and mechanical galvanizing.
South River Metal Products Div. manufactures
mounting hardware for antennas and satellite
dishes.

Diamond Electronics.(614) 756-9222
PO Box 200
Lancaster, OH 43130
PERSONNEL: Robert Quinlan, Vice President/
General Manager; Lee Montgomery, Sales Manager
DESCRIPTION: Manufacturer of directional taps.



Digitel.(215) 659-4047
2255 E Wyandotte Road
Willow Grove, PA 19090
PERSONNEL: Richard Grasso; Joe Bartholomew
DESCRIPTION: Repair service specializing in
scrambler/encoder (analog or digital) and baseband
or RF modems. Headend and LAN consulting.



Digitrace Inc..(313) 234-1301
WATS(National).(800) 443-1403
2040 S. Saginaw
Flint, MI 48503
PERSONNEL: Paul Hales, President; Ken Schwind,
Vice President; Al Winter, Sales Manager
DESCRIPTION: Serving the cable industry in the
repair and remanufacturing of converters and
transmitters since 1983. Services include converter
repair: Jerrold and Oak addressable and all basic
converters. Converter modifications. Transmitter
repair: all makes. Sale of new transmitters for
Jerrold 400 and 450 converters. New repair parts.
Sale of remanufactured converters. Distributor
for new converters. Manufacturer of IBM
Compatible PC, XT/AT Computers. Distributor for
computer software, printers, monitors and other
components.



Dinsmore Comm. Corp.. . . .(603) 436-6344
WATS(National).(800) 238-2338
600 State St.
PO Box 4253
Portsmouth, NH 03801
PERSONNEL: Dennis Dinsmore, President; David
Walters, Vice President; Peter Little, Sales Manager
DESCRIPTION: Complete turnkey construction
services for underground, aerial, and apartment
pre/post wiring.

Ditch Witch.(405) 336-4402
WATS(National).(800) 654-6481
PO Box 66
Perry, OK 73077
PERSONNEL: Ed Malzahn, President; Paul Rogers,
Sales Manager
DESCRIPTION: Ditch Witch manufactures a full
line of trenching and vibratory plow equipment for
installing television cable underground. In addition,
Ditch Witch offers a selection of attachments and
accessories including boring equipment, utility
backhoes, tampers and equipment trailers. Pierce
Arrow® underground piercing tools are also
available through most Ditch Witch dealerships.

DIVERSIFIED CONTROL SYSTEMS

Diversified Control Systems. . . .(716) 835-1818
327 Windermere Blvd.
Amherst, NY 14226
PERSONNEL: Brent James, President
DESCRIPTION: Security devices; locks for
pedestals, apartment boxes and power supplies;
hand-held computers for tap-auditing.



Donley International, Inc.. . .(713) 956-2984
(For WATS—At Tone dial 538
WATS(National).(800) 231-0629
WATS(State).(800) 392-4900
7720 Blankenship St.
Houston, TX 77055
PERSONNEL: J.D. Thomas, President; Mitch
McGaughey, Sales Manager
DESCRIPTION: Master stocking distributor for
headend and distribution equipment. Stocking
DX Communications, Cadco, Triple Crown, ISS,
General Instrument Commercial and Residential
VideoCiphers, character generators, closed-
caption and teletext decoders, Monroe Time-Tone
switches, Miralite antennas. Serving cable, SMATV,
MATV, hospital and educational systems operators.
Design assistance available.

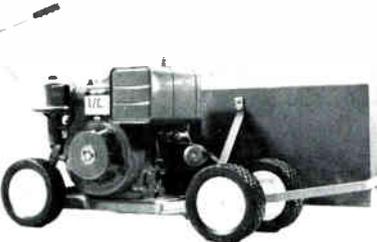
E-Z TRENCH

OUR NAME
SAYS IT ALL



J-1000
cuts: 1-2" wide/7" deep

Can it pay for its self in only one day?! E-Z Trench makes trenching a very quick and easy one man operation, while saving valuable time and money. Cuts approximately 100 feet in five minutes. Giving the most professional look possible with virtually no damage to the turf. Its rugged construction and dual belt drive produces long and dependable service, with a very small investment.



J-2000
cuts: 2¾" wide/8" - 13½" deep

Shouldn't you consider an E-Z Trench?

Call for: Nearest Distributor or order direct.

E-Z TRENCH
Rt. 3 Box 78-B
Loris, S.C. 29569
803-756-6444

Reader Service Number 29

Douserv Consulting Corp.

Douserv Consulting Corp.(214) 341-9495
9269 Wendell Road
Dallas, TX 75243
PERSONNEL: G.R. Doucet, President; Steve Brower, CEO-General Manager
DESCRIPTION: Member of NCTA, offers complete engineering, technical, managerial and support services to the CATV industry. Performs field work, strand mapping, pole contact permit, make-ready, work system design, headend configuration, preparation of tender documents and construction/project management, international cable projects.

Dow-Key Microwave Corp.(805) 684-0427
1110 Mark Ave.
Carpinteria, CA 93013
PERSONNEL: Jack Graham, Chairman; Peter Sutherland, Vice President/COO/General Manager; L.B. Johnson, Vice President/Operations; Jack Dysart, Sales Manager
DESCRIPTION: Electromechanical coaxial RF and relays and microwave switches.

Drake, R.L. Co.(513) 866-2421
PO Box 112
Miamisburg, OH 45342
PERSONNEL: Ronald Wysong, President; Mike Brubaker, Vice President/Sales; Merl Powell, Vice President/Marketing; Steve Koogler, Vice President/Engineering; Richard Renken, Sales Manager
DESCRIPTION: The R.L. Drake Company is a manufacturer of commercial grade earth station receivers, modulators, and LNB's.

Drop Shop Ltd.(415) 887-7470
WATS(National).(800) 526-4100
PO Box 284
Roselle, NJ 07203
PERSONNEL: Dan Parsont, President; David Wank, Vice President/Sales
REGIONAL OFFICES: 2416 Tripaldi, Hayward, CA 94545, (800) 227-0700.
DESCRIPTION: All drop materials, cordless drills, apartment boxes, splitters, cable marking devices, house amplifiers, tools and speciality items—distributor and consultant to cable TV, pay-TV markets; specialize in prompt delivery. The only one stop center for all drop and installation materials.

Dunkleberger(812) 275-5656
Construction, Inc.
RR 14
PO Box 132
Bedford, IN 47421
PERSONNEL: Roger Dunkelberger, President; Lesa Dunkelberger, Sales Manager
DESCRIPTION: New or rebuild cable TV construction; aerial or underground.

Durnell Engineering, Inc.(712) 852-2611
PO Box 60
Emmetsburg, IA 50536
PERSONNEL: Morris Durnell, President; Mike Flannegan, Sales Manager
DESCRIPTION: Aerial personnel bucket lifts, truck or van mounted.

E-Z TRENCH Manufacturing Co., Inc.

E-Z TRENCH MFG. CO. INC. . . . (803) 756-6444
OUR NAME SAYS IT ALL
Rt. 3 Box 78B
Loris, SC 29569
PERSONNEL: Roger Porter, President
DESCRIPTION: Mfgs. and distributes lightweight

one man trenchers. Designed for cutting 7'13' deep and 1½'-2¾' wide 150/10 min. EZ Trench gives the most professional look possible with virtually no damage to the turf.



E.A. Design, Ltd.
Communications Engineering

E.A. Design, Ltd.(215) 657-8330
2500 Office Ctr., Maryland Rd.
PO Box 483
Willow Grove, PA 19090
PERSONNEL: Max Spector, President; Alan Katz, Executive Vice President; Neal Spector, Vice President-Services
DESCRIPTION: Expert strand mapping—electronic design; as built walkouts; computer design and drafting; utility make-ready negotiations on the highest level of professionalism and experience; computerized records system multi-purpose.

ECA.(918) 786-5349
Manufacturing Division
PO Box 2029
Grove, OK 74344
PERSONNEL: Tony Bickel, President
DESCRIPTION: Manufacturer of cable television headend equipment, and custom design and manufacturers of microwave systems and troposcatter systems. Consultant to the CATV industry.

ECTV Inc.(718) 785-6996
3614 11th St.
Long Island City, NY 11106
PERSONNEL: George Legrand
REGIONAL OFFICES: 44-45 Vernon Blvd., Long Island City, NY 11101, (718) 706-8057.
DESCRIPTION: Buys and sells reconditioned converters. Converter repair.

EEG Enterprises, Inc.(516) 293-7472
1 Rome St.
Farmingdale, NY 11735
PERSONNEL: Edward Murphy, President; William Posner, Vice President/Sales Manager; William Jorden, Vice President
DESCRIPTION: Manufacturer of: parental control locks and TV vertical interval encoding and decoding equipment, closed captioning and data casting systems.

EF Data Corp.(602) 968-0447
1030 N. Stadem Dr.
Tempe, AZ 85281
PERSONNEL: Robert Fitting, President; Steve Eymann, Vice President; Alan Potter, Director/Sales & Marketing
REGIONAL OFFICES: Winfield Scott Assoc., PO Box 1149, Grape Vine, TX 76051, (817) 488-0029; Microsat, 1519 Johnson Ferry Road, Ste. 250, Marietta, GA 30062, (404) 971-1021; Peripheral Innovations, Lakeside Office, Bldg. D, Wakefield, MA 01880, (617) 245-2302; SJI Corp., 5950 6th Ave. South, Ste. 101, Seattle, WA 98108, (206) 763-8981; Arc Electronics, 905 Bassett Road, West Lake, OH 44145, (800) 321-2510; Data Systems Marketing Corp., 375 Prince Georges Blvd., Upper Marlboro, MD 20772, (301) 390-7000.
DESCRIPTION: Manufacture high speed broadband voice data modems for coaxial cable and micro radio.

EM Electronics, Inc.(215) 352-4155
545-547 Commerce Dr.
Yeadon, PA 19050

PERSONNEL: Elena Dimaggio, President Vice President
 REGIONAL OFFICES: 3341-47 W Montrose Ave., Chicago, IL 60618.

DESCRIPTION: EM Electronics Inc. is an OEM supplier of active-passive subscriber equipment. We also offer a full line of headend, distribution electronics, hardware, connectors and satellite receiving equipment from selected domestic vendors.

EPD Electronics, Inc. (213) 515-4996
 16921 S Western Ave.

#110
 Gardena, CA 90247
 PERSONNEL: Mark Itokawa, President
 DESCRIPTION: Importer of F, N, BNC connectors. Also import ready made cable.



Eagle Comtronics, Inc. (315) 622-3402
WATS(National). (800) 448-7474
 4562 Waterhouse Road
 Clay, NY 13041

PERSONNEL: Alan Devendorf, President; Joseph Ostuni, Vice President Sales and Marketing; Chester Syp, Manager/National Sales
 DESCRIPTION: Super traps, decoding filters, taps, addressable and programmable descramblers, converters.

Early & Sons, Inc. (617) 374-8033
 58 S Kimball St.
 Bradford, MA 01830
 PERSONNEL: Richard Early, Jr., Vice President
 DESCRIPTION: Underground cable TV specialist.

Easley Equipment Co. Inc. . . . (901) 362-7721
 2807 Farrisview Blvd.
 Memphis, TN 38118
 PERSONNEL: Warren Easley, President
 DESCRIPTION: Sell aerial buckets and all types of trucks and vans

Eastern Earth. (717) 287-9621
 Boring & Equipment
 99 Parry St.
 Luzerne, PA 18709
 PERSONNEL: Walter Remphrey, President; Norman Collins, Secretary/Treasurer
 DESCRIPTION: Sell and service heavy duty utility equipment. Heavy duty earth boring machines equipped with pole setting derrick, hydraulic power tools, pole and cable reel trailers, and mobile fiber optic splicing laboratory.

Edmunds Cable Services. (914) 744-5387
 PO Box 391
 Pine Bush, NY 12566
 PERSONNEL: Phillip Edmunds, President
 DESCRIPTION: Domestic installations, apartment wiring, drop change out, audit. We use uniformed employees, company owned, brightly lettered vehicles. Operations coast to coast—references many and strong.

EHLEN SOFTWARE PRODUCTS, INC.

Ehlen Software Products Inc. . . (901) 795-8314
 6064 Appletree, Suite 1
 Memphis, TN 38115

PERSONNEL: Snowden Bunch, President; Bruce Gronich, Vice President; Doug Duncan, Sales Representative

REGIONAL OFFICES: 6319 Briarwood Road, Columbia, SC 29206, (803) 787-7256.

DESCRIPTION: Our Cabill Management System is written in a state of the art fourth generation relational database language. Computer software tailored to CATV firms, including billing and accounts receivable, accounts payable, general ledger, payroll, work order maintenance and subscriber addressing. Staff training, support and software maintenance. Established customer base. Spanish versions of software available, and supported. Software runs on AT computers, 386, NCR Tower and AT&T 3B2 Mini computers. Can accommodate 500 to 5,000,000 subscribers.

Electra Motion, Inc. (818) 449-7917
 40 N Daisy Ave.
 Pasadena, CA 91107

PERSONNEL: Gerald Graydon, President/Sales Manager; Dan Cartwright, Vice President
 DESCRIPTION: CATV distribution power supply 60 volt, 15 amp. Available in single or dual configuration, pole mount or pedestal.

Electrodyn INC.

Electrodyn Inc. (812) 334-1023
 917 S Rogers St.
 Bloomington, IN 47401
 PERSONNEL: Mark Adams, President; Bruce Raper, Vice President; Dan Steinmetz, Sales Manager
 DESCRIPTION: Electronics servicing and reconditioning of tuners, CATV converters, MATV amplifiers, line and trunk, line extenders, and TVRO service including repair of satellite receivers, down converters and antenna positioners.

Electrohome Ltd. (519) 744-7111
 809 Wellington St. N
 Kitchener, ONT, N2G 4J6
 PERSONNEL: J.A. Pollock, President/Chairman/CEO; H.H. LaPier, Vice President/Operations; J.G. Gingerich, Corporate Controller; W.N. Nobbs, Group GM/Elct. Div.
 REGIONAL OFFICES: Tonawanda, NY (716) 694-3332; Morristown, TN (615) 587-5250; Ontario, Canada, (714) 983-5660.
 DESCRIPTION: Manufactures and/or distributes a wide range of electronic equipment. Video display, projection data/graphics and video TV systems, videotex computergraphics equipment, single and double sided PC. boards, contract design, engineering and manufacturing.

Electroline TV (514) 374-6335
 Equipment, Inc.
 8750 8th Ave.
 Montreal, Quebec, H1Z 2W4
 PERSONNEL: M. Olfman, Vice President; Henri Bertemes, Sales Manager; Mitchell Goldberg, Applications Engineer
 DESCRIPTION: Electroline manufactures an off-premises addressable system in addition to amplifiers, filters, directional couplers and custom made products for the CATV & MATV industry.

Electrotex. (713) 526-3456
 2300 Richmond Ave.
 PO Box 66907
 Houston, TX 77098
 PERSONNEL: Donald Simon, President; George Langston, Executive Vice President
 REGIONAL OFFICES: 813 Morrow, Austin, TX

78757, (512) 454-0318; 1275 S. 11th, Beaumont, TX 77701, (713) 838-6421; 1410 Crescent, Corpus Christi, TX 78412, (512) 854-5306; 4435 Airline Dr., Houston, TX 77022, (713) 695-6851; 8540 Winkler Dr., Houston, TX 77017, (713) 941-7016; 430 Atkinson Dr., Lufkin, TX 75901, (713) 632-4409; 1200 W. Hildebrand, San Antonio, TX 78201, (512) 735-9271, 9151 Forest Lane, Dallas, TX 75243, (214) 234-0433.

DESCRIPTION: Distributor for Belden CATV cable, Winegard electronic components, M/Com MATV/CATV, Xcelite tools, Hitachi cameras, Broadline electronic parts.

Elephant Industries, Inc. (813) 995-7383
 5570 Enterprise Parkway
 PO Box 3626

Fort Myers, FL 33905
 PERSONNEL: William Schosek, President
 DESCRIPTION: Hydraulic boring equipment for underground pipe and cable installation. Specializing in road and driveway work.



English Enterprises (305) 898-713-
 Box 6494
 Orlando, FL 32853

PERSONNEL: Gary English, President
 DESCRIPTION: Contract services to the cable industry: residential installations, underground drop buries, underground construction, MDU wiring, MDU design, pre and postwires, apartment activations, nonpay converter collections, tap audits, rebuild drop swings. 1,000,000 installs since 1974. The Professional Choice.

Excalibur Cable Comm. Ltd. . . . (703) 777-5905
 WATS(State). (703) 451-7584
 6 Loudon St. SW
 Leesburg, VA 22075

PERSONNEL: Konrad Poth, President; Larry Gibson, Secretary/Treasurer/Chairman; Christopher McCarty, Vice President; James Connors, Vice President
 REGIONAL OFFICES: 8906 Telegraph Road, Lorton, VA 22079, (703) 339-8800.
 DESCRIPTION: Excalibur is a CATV contracting and construction company specializing in residential installations, multi-unit, postwires and prewires, turnkey hi-rise construction and installations, underground construction and all related rough balancing and splicing. Field engineering and design work on apartment complexes is also provided.

FM SYSTEMS, INC.

FM Systems, Inc. (714) 979-3355
WATS(National) (800) 235-6960
 3877 S Main St.

Santa Ana, CA 92707
 PERSONNEL: Frank McClatchie, President; Joe Dean, Sales
 DESCRIPTION: FM Systems, Inc. manufactures and markets the FMT 633S stereo TV modulator

Facile Technologies Inc .

(4.5 megahertz), and a device for transmitting MTX stereo through super trunks (FMU618 MTS and FMD618 MTS). Manufactures other stereo processors for MTV, HBO, Showtime, etc. We manufacture SDM-1, the first TV audio deviation meter. Now you can accurately set the loudness of all your TV audio channels. Distributed in Canada through DGH Comm. Systems Ltd.

Facile Technologies, Inc. (201) 684-1000
185 Sixth Ave.
Paterson, NJ 07509
PERSONNEL: H. Weeks, Jr., President
DESCRIPTION: Manufacturers of shielding tapes used in coaxial cable.

Fairchild Data Corp. (602) 949-1155
350 N Hayden Road
Scottsdale, AZ 85257
PERSONNEL: Milt Deever, CEO; Steve Oney, Vice President/Prod. Operations; Karl Gohlke, Vice President/Technology; Raymond Kelsey, Director/Marketing; Ken Cooper, Director of Sales
DESCRIPTION: Manufacturer of high-speed data modems. The modems have data rates of 56 Kbps to 10 Mbps and are frequency agile between 5 and 400 MHz in 50 KHz steps with full independence between send and receive.

Falcone International Inc. (404) 427-9496
PO Box 3067
Marietta, GA 30060
PERSONNEL: Allen Kirby, Vice President/Sales
REGIONAL OFFICES: Have dealers and manufacturers representatives throughout the United States.
DESCRIPTION: Manufacturers of automated commercial insertion equipment.

Fastex. (312) 299-2222
Div. of Illinois Tool Works
195 Algonquin Road
Des Plaines, IL 60016
DESCRIPTION: Wire and cord clips from ITW-Fastex, efficiently organized wire, cords and cables. Snap-in or adhesive back clip styles provide fast, easy mounting. One piece Plastinite™ strain relief grommets snap easily into panel holes to retain and protect cords from push or pull forces. With over 40 Fastex Distributors nationwide, we are nearby and ready to find the wire management solution that works for you. Call us today at (312) 299-2222.



Federal Telecom®

Federal Telecom Inc. (312) 381-8700
1000 Hart Road
Barrington, IL 60010
PERSONNEL: John Middlebook, President; Ken Gentry, Vice President-Manufacturing; John Massouras, Sales Manager; Jim Ryan, Plant Manager
DESCRIPTION: Federal Telecom Inc. is a leading supplier of Buried Plant Housings to the CATV industry. C124 Series Polyped Housings: Used to house and protect taps, splitters, line extenders, directional couplers and some amplifiers, as well as other components used by the CATV industry. C1230 Amplifier Polyped Housing: Used primarily to house and protect amplifiers.

Ferguson Comm. Corp. (214) 854-2405
Rte. 1
Box 135-A
Laneville, TX 75667

PERSONNEL: Mac Ferguson, President; Rex Ferguson, Vice President
DESCRIPTION: Design, engineering and installation services.

First Data Resources Inc. (402) 399-7035
7301 Pacific St. C-46
Omaha, NE 68114-5497
PERSONNEL: Jay Oxtan, President-Cable Division; Jim Perkins, Director of Cable Operations; David Scott, Marketing Manager
REGIONAL OFFICES: KMP COMPUTER SYSTEMS, 2075 Trinity, Ste. 100, Los Alamos, NM 87544, (505) 662-7700, Eldon Pequette, President; KMP Computer Systems offers CABLESTAR, a personal computer based billing and management information system. KMP's CABLESTAR currently serves over 250 CATV systems nationwide. Software packages are available for your IBM or compatible personal computer. KMP is a wholly owned subsidiary of First Data Resources Inc.
DESCRIPTION: First Data Resources (FDR) is a leading provider of subscriber billing and management information services in the cable TV industry. FDR's Cable System Services Division currently supports over 350 cable systems serving over 4.5 million subscribers. FDR offers a range of advanced management information system products.

Fishel Co., The. (614) 486-5211
1170 Kinnear Road
Columbus, OH 43212
PERSONNEL: J. Keeler Jr., President; Perry Pauley, Vice President
REGIONAL OFFICES: 11441 Mosteller Road, Cincinnati, OH 45241, (513) 771-3650; 4508 Bishop Lane, Louisville, KY 40218, (502) 456-2900; 1625 Brumlow Ave., Southlake TX 76092, (602) 233-0658.
DESCRIPTION: The Fishel Co. is a national utility contractor who can provide full services including: house and apartment wiring; aerial; drop and underground construction, including plowed and trenched cable.

Fisher Research. (209) 826-3292
Laboratory, Inc.
1005 I St.
Los Banos, CA 93635
PERSONNEL: Jim Wellen, President; Louis Ciuffo, Sales Manager
DESCRIPTION: Pipe and cable locators, cable fault locators, AC voltage, detectors, liquid leak detectors, water well level indicators.

Futronics Inc. (419) 332-5681
WATS(State). (800) 443-2929
1524 Oak Harbor Road
Fremont, OH 43420
PERSONNEL: Michael Gruss, President
REGIONAL OFFICES: 720 Illinois Ave., Ste. J, Maumee, OH (419) 893-5681.
DESCRIPTION: System consultants, providing engineering of antenna systems. Provide consulting data on sub-leasing towers and data system management.

G & L General. (205) 821-7407
Contractors, Inc.
PO Box 1232
Auburn, AL 36830
DESCRIPTION: Provides installation services and general contracting services.

GNB Incorporated. (612) 681-5000
1110 Hwy. 110
Mendota Heights, MN 55118
PERSONNEL: Stanley Gaines, President; Malli Rao, Vice President/Sales; Don Gray, Sales Manager; Mitch Bregman, Sales Manager; Bill Henry, Sales Manager

REGIONAL OFFICES: 415 E Golf Road, Arlington Heights, IL 60005, (312) 593-3991; 1880 Valley View Lane, Farmers Branch, TX 75381, (214) 243-1011; 330 Alexander St., Princeton, NJ 08540, (609) 683-8700.
DESCRIPTION: GNB Incorporated is the manufacturer of Watchman™ CATV/Standby power 12 volt batteries.

Gabriel Electronics, Inc. (207) 883-5161
PO Box 70
Scarborough, ME 04074
PERSONNEL: Harold Whetstone, Sales Manager
REGIONAL OFFICES: 111 W Port Plaza, #600, St. Louis, MO 63146, (314) 878-2982.
DESCRIPTION: Manufacturer of microwave point-to-point antenna systems, including CARS band and studio transmitter links. All microwave transmission lines supplied i.e., elliptical, rectangular, and circular systems, plus accessories, including dry air pressurizers. Installation of antennas and microwave systems plus test and guarantee are provided by Gabriel.

Gamco Industries. (201) 381-0700
19 Walnut St.
Clark, NJ 07066
PERSONNEL: Fred Whiting, Executive Vice President; Shelia O'Sullivan, Vice President-Sales & Mktg.; Carmine Amatucci, National Sales Manager
DESCRIPTION: Manufacture passive and active line equipment: line extenders, channel droppers, subscriber traps, passive line and trunk amplifiers. Full line of drop material.

Gem Top Mfg. Inc. (503) 659-3733
WATS(National). (800) 547-9706
8811 SE Herbert Court
Clackamas, OR 97015
PERSONNEL: H.O. Geisler, President; Roger Foster, National Sales Manager; James Fuglestad, Western Reg. Sales
DESCRIPTION: Manufacture and sales of steel commercial Gem Top Pickup covers and distributors of interior shelving and ladder racks for use in both pickups and vans. Manufacturer of recreational pickup covers made from steel and rovel plastic.

General Cable Co. (303) 427-3700
Apparatus Division
5600 W 88th Ave.
Westminster, CO 80030
PERSONNEL: Van Walbridge, Vice President; Dan King, Sales Manager
REGIONAL OFFICES: 2249B Davis Ct., Hayward, CA 94545, (415) 785-0821; PO Box 579, Hughes Ford Road, Frederick, MD 21701, (301) 662-6262; 5220 Minola Road, Lithonia, GA 30058, (404) 981-7470.
DESCRIPTION: Telsta aerial lifts for splicing, maintenance and construction of CATV aerial plant.

General Electric Co. (804) 483-5000
Consumer Electronics Division
Portsmouth, VA 23705
PERSONNEL: Ron Polomsky, Manager Sales-Mktg. Comband Prod.
DESCRIPTION: Comband Systems, an addressable system which compresses pairs of video and audio program sources on a single 6 mega hertz RF channel, providing carriage of up to twice the number of program sources as currently carried. Systems available for CATV and MDS/MMDS applications.

General Machine. (215) 357-5500
Products Co., Inc.
3111 Old Lincoln Hwy.
Trevose, PA 19047
PERSONNEL: William Pfundt, Mktg. Manager; D. Clemens, Vice President/Sales
REGIONAL OFFICES: 525 Reactor Way, Reno,

NV 89502, (702) 786-5500.
DESCRIPTION: Outsideplant tools and accessories for CATV and telecom construction.

General Sealants Inc. (818) 961-0211
WATS(National) (800) 762-1144
 300 S. Turnbull Canyon Road
 City of Industry, CA 91745
PERSONNEL: Brad Boyle, Sales Manager
DESCRIPTION: Manufacturer of extruded sealants.

General Semiconductor (602) 968-3101
Industries, Inc.
 2001 W. Tenth Pl.
 Tempe, AZ 85281
PERSONNEL: Gerald Myers, President/CEO
DESCRIPTION: Manufacturers of transient voltage suppressors designed for power, insertion applications with cable communication systems.

Gilbert Eng. Co. Inc. (602) 245-1050
WATS(National) (800) 528-5567
 PO Box 23189
 Phoenix, AZ 85063-3189
PERSONNEL: Robert Spann, President
DESCRIPTION: Gilbert Engineering manufactures a full line of coaxial connectors for trunk, distribution and drop cables including housing to housing, right angle connectors, 90 degree connectors, and GF-59-CIS/series, GF-6-CIS/series weather tight connectors.

Global Cable, Inc. (414) 272-7716
 324 W Cherry St.
 Milwaukee, WI 53212
PERSONNEL: Robert Valente, President; Mike Brown, Vice President/Construction & Engineering; Edward Pask, Vice President/Residential Operations
DESCRIPTION: Cable television construction, all phases: residential and commercial installation, and system analysis. Consultant to municipalities concepts, storylines and treatments.

Global Systems Corp. (617) 373-4392
 15 Hale St.
 Haverhill, MA 01830
PERSONNEL: Thomas Jarman, President; George Young, Engineering Manager
DESCRIPTION: Manufactures MDS and ITFS down converters and transmitters.

Gould Inc. (312) 640-4000
 10 Gould Center
 Rolling Meadows, IL 60008
PERSONNEL: Gerard Corbett, Director of Corp. Comm.; Henry Peppers, Exec Vice President
Defense Systems; James McDonald, a President/COO; Dr. J. Rowe, V.Chairman/Chief Technical Off; Richard Abraham, Exec Vice President/
Electric Components
DESCRIPTION: International developer and manufacturer for electronic systems, products and components.

Great Lakes. (414) 887-7651
Data Systems, Inc.
WATS(National) (800) 882-7950
 1519 N Spring St.
 Beaver Dam, WI 53916
PERSONNEL: Lon Rosado, President; Gerry Pauls, Vice President/Sales Manager
DESCRIPTION: Provides in-house user defined cable billing systems designed by cable management people written in a PC compatible language for systems from 300-20,000 subs.

Great Plains Inc. (417) 682-3536
 PO Box 32
 Lamar, MO 64759
PERSONNEL: J.R. Foree, President
DESCRIPTION: Aerial pole line construction.

Greater Distributing. (312) 998-0444
Service, Inc.
 2053 John's Dr.
 Glenview, IL 60025

PERSONNEL: Alan Schulman, President
DESCRIPTION: Nationwide distributors of stand-by power batteries. Distributors of GNB (Gould), Watchman 1, Watchman 11 and Gelseal batteries.

Griffin, Frederick G., P.C. (804) 237-2044
 3229 Waterlick Road
 Lynchburg, VA 24502
PERSONNEL: Frederick Griffin, PE; John Hayden, PE; Martin Barringer, EIT Staff Engineer; Bernhard Klein, Staff Engineer
DESCRIPTION: Consulting in the areas of engineering, construction, feasibility study, refranchising and system appraisal.



Ground Hog Inc. (714) 888-2818
WATS(National) (800) 922-4680
 25010 E. 5th St.
 San Bernardino, CA 92410
PERSONNEL: Dick Carlson, President
DESCRIPTION: Manufactures earth augers and trenchers.

TELSTA®

ONE SWEET DEAL

ONE PACKAGE PRICE

\$24,120* complete and ready to go. The price includes an A-28 lift, 1987 Ford E-350 Van with V-8, auto-trans, 9500 GVWR, aerial lift power unit (APU) and standard options such as 110 Volt outlets at basket and ground control stations, and emergency lower.

ONE DIRECT SOURCE

You buy direct from the manufacturer. No dealers, no third parties, no hassle.

ONE YEAR WARRANTY

It's the strongest warranty in the industry and it's supported by Telsta's network of service and part centers. One call gets you factory-direct service.

ONE CALL DOES IT

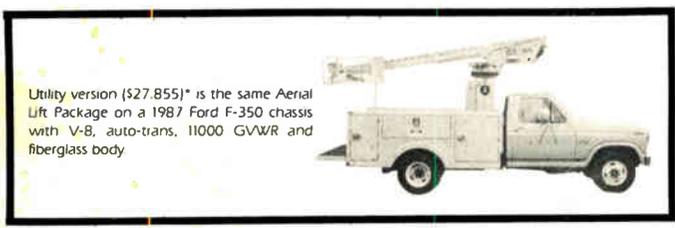
Call (303) 427-3700 Ext. 311 to get the ball rolling. You'll get the most productive tool in the CATV industry at a price far lower than you expected. And faster than you expected too. Call today for one sweet deal.



See us in Atlantic City in Booth V-5.



*Prices slightly higher in California
 Prices good for 1987 chassis only.
 1988 chassis prices may be higher
 All prices FOB Telsta Plant excluding taxes and registration.



Utility version (\$27,855)* is the same Aerial Lift Package on a 1987 Ford F-350 chassis with V-8, auto-trans, 11000 GVWR and fiberglass body.

TELSTA®
A LIFT ABOVE THE REST

General Cable Company
 P.O. Box 666, 5600 West 88th Ave.
 Westminster, Colorado 80030
 Phone: 303-427-3700
 Facilities in Hayward, CA
 Frederick, MD
 Lithonia, GA
 A Unit of PC Telecommunications

Grumman Electronics

Grumman Electronics Systems . (516) 435-6089

Sunrise Highway
Great River, NY 11747
PERSONNEL: Edward Youskites, Marketing Manager
DESCRIPTION: Complete turnkey systems for Ad Insertion. Systems include sales order entry, schedule operation, machine control, billing and verification. Modular design allows expansion. Systems designed for broadcast and cable industries.

Guyer, Beard (303) 393-6181

& Associates, Inc.
50 So. Steele St.
Suite 660
Denver, CO 80209
PERSONNEL: Stephen Guyer, President; Carl Johnson, Vice President; Alan Garrison, Vice President
DESCRIPTION: Guyer, Beard & Associates is a results oriented information systems and financial consulting firm that will assist you in achieving your business goals. GBA maintains the approach that guarantees the result-measurable benefits to you. For the past fifteen years, our consultants have successfully assisted clients in the areas of strategic marketing/financial analysis and planning, decision support systems, design and modeling, expert technical services, venture capital proposals, and value added products and processes.

H A Solutec Ltd. (514) 524-6893

4360 D'iBerville
Montreal, Quebec, H2H 2L8
PERSONNEL: Ernest Grondin, President; Gilles Fortin, Vice President/Marketing
DESCRIPTION: SOL 6800 and SOL 6800/mini automated broadcasting system for commercial insertion. SOL 8200 co-channel fil. Also SOL 6800/UIS and 6800/MICRO automated broadcasting system for commercial inserts. SOL 20/20 V.U./ P.P.M. Audio level indicator with phase monitoring. SOL 5532 & 5532A stereo distribution amplifiers. SOL 3450 video distribution amplifier.

Hall Equipment. (713) 783-1710

& Supply Co.
5711 Schumacher
Houston, TX 77057
PERSONNEL: Conway Hall, President; Larry Dewey, Vice President
REGIONAL OFFICES: 1100 N Loop 12, Irving, TX 75061, (214) 445-0848.
DESCRIPTION: Distributors of trenchers, backhoes and boring equipment.

Halley Systems. (408) 434-3500

2811 Orchard Parkway
San Jose, CA 95134
PERSONNEL: Ed Moura, President; Ralph Jacobi, Sales Manager
REGIONAL OFFICES: 913 Route 23, Pompton Plains, NJ 07444, (201) 831-0066.
DESCRIPTION: Halley Systems designs, manufactures and sells internetworking products based on broadband backbone cable systems. Those include: modems, network management systems, bridges/routers, etc.

Halls Safety (412) 458-7202

Equipment Corp.
Route 173 North
Box 230
Grove City, PA 16127

DESCRIPTION: Halls boots, Klein tools, Carhartt clothing and Lemco and Jackson cable supplies.

Harrell Enterprises of Ill. (312) 226-0533

5055 W. Touhy Ave.
Unit J
Skokie, IL 60077
PERSONNEL: Glen Kirsch, President; Robert Young, Vice President
REGIONAL OFFICES: 316 W. Wells, Milwaukee, WI 53208, (414) 344-2255.
DESCRIPTION: Contractor performing installation, multiple dwelling unit and underground services nationally. Experienced: union, non union, EEO, bonding, insurance. Presently employs 100+ people. Operating locations in San Francisco, CA, Milwaukee, WI, Queens, NY, Chicago, IL.

Harris Broadcast Microwave. . . . (415) 969-9100

967 Stierlin Road
Mountain View, CA 94043
PERSONNEL: Frank Blaha, Director-Sales & Marketing; Cliff Fields, Domestic Sales Manager; Eric Gibbons, Central Regional Sales Manager; John Morrissey, Western Regional Sales Manager; George Maier, Eastern Regional Sales Manager
REGIONAL OFFICES: 64 Shadow Oak Dr., Sudbury, MA 01776, (617) 443-7042.
DESCRIPTION: Fixed and portable video microwave systems. Video exciters for portable uplink.

Harris Corp. (305) 724-3910

Satellite Comm. Division
PO Box 1700
Melbourne, FL 32901
PERSONNEL: Lee Blachowicz, General Manager; Herbert Shannon, Sales Director; Todd Gross, Sales
DESCRIPTION: Offer full product line of TVROS and up/down links for video and digital systems. Harris Corp., includes, computers, printing, semi-conductors, etc.

Harris Corp. (415) 969-9100

Video Systems Oper.
967 Stierlin Road
Mountain View, CA 94043
PERSONNEL: H. Kenneth Regnier Jr., Vice President/General Manager; Ron Frillman, Manager/TV Video Sales
REGIONAL OFFICES: 1451 Owen Dr., Clearwater, FL 33519, (813) 797-4191; 17 Tally Ho, Ridgefield, CT 06877, (203) 431-9386; PO Box 710, Blue Jay, CA 92317, (714) 336-3046; 8663 W 108th Pl., Overland Park, KS 66210, (913) 451-9966.
DESCRIPTION: Time base correctors, frame synchronizers, still/slide storage systems, and digital video effects systems.

Henkels & McCoy, Inc. (215) 283-7600

Jolly Road
Blue Bell, PA 19422
PERSONNEL: Joseph Barnett, Engineering Div. Manager
REGIONAL OFFICES: NJ Div., Elbow Lane, Burlington, NJ 08016, (609) 387-9000; SE Div., Bellcor Dr., Industrial Park, Newcastle, DE (302) 328-1586; Rising Sun Div., Rising Sun, MD 21911, (301) 658-5522; York Div., PO Box 1742, York, PA 17405, (717) 266-5641; SW Div., 4220 Justin Road, Lewisville, TX 75067, (214) 539-1746; Rocky Mtn. Div., 1630 Chambers Road., Ste. 107, Aurora, CO 80011, (303) 360-0472; Great Lakes Div., 1800 Johnson St., Elkhart, IN 46514, (219) 264-1121; W Div., 5031 NE 148th Ave., Portland, OR 97220, (503) 255-5125.
DESCRIPTION: All phases of engineering, construction, and training. Presently our services include the following: Feasibility studies, strand mapping, application/make ready survey, bills of materials, technical and engineering consulting services in all phases of cable TV, as builds and post surveys, permit preparation, system activation/

proof of performance, on site maintenance personnel, training services (lineman to technicians), aerial and U.G. construction, make ready construction, tower and building foundations.

Herbert Boyer Co. (212) 744-7558

14 E 77th St.
New York, NY 10021
PERSONNEL: Herbert Boyer, President; William Parsons, Vice President
DESCRIPTION: Engineering consulting, market research, investment consultants and executive searches. Clients are equipment manufacturers and MSOs.

Hewlett-Packard. (415) 857-1501

3000 Hanover
Palo Alto, CA 94304
PERSONNEL: John Young, Chief Executive Officer; Dean Morton, Exec. Vice President/COO
REGIONAL OFFICES: Manufacturers of RF spectrum analyzers geared for CATV measurements, and a broad line of general purpose test equipment such as voltmeters.

High Technology Group. (203) 966-4820

72 Park St.
New Canaan, CT 06840
DESCRIPTION: Industry consultants.

Hitachi Denshi America. (516) 921-7200

175 Crossways Park W
Woodbury, NY 11797
PERSONNEL: J. Tosaka, President; Bernard Munzelle, Vice President; S. Hotta, General Manager
REGIONAL OFFICES: 250 E Devon Ave., Itasca, IL 60143, (312) 250-8050; 3610 Clearview Pkwy., Doraville, GA 30340, (404) 451-9453; 14169 Proton Road, Dallas, TX 75234, (214) 233-7623; 18005 S Adria Maru Lane, Carson, CA 90746, (213) 538-4880.
DESCRIPTION: Manufacture auto set-up color video cameras and 1 inch video tape recorders. Ideal for use in portable or field production, studio production, graphics and mobile vans. Test and measurement equipment including waveform monitors and oscilloscopes.

Hoffman & Hoffman. (319) 232-4807

Trenching, Inc.
PO Box 866
Cedar Falls, IA 50613
PERSONNEL: Duane Hoffman, President; David Hoffman, Vice President
DESCRIPTION: All types of underground cable placing and boring. Excellent reputation on cleanup restoration of areas where cable has been placed. We work all of the midwest states.

Holbury Precision Plastics. . . . (616) 782-7620

One Woodhouse Dr.
Dowagiac, MI 49047-0699
PERSONNEL: Jerry Wilson, President; Greg Holbury, Sales Manager
DESCRIPTION: Flag markers for buried cable lines. Environment safe; brightly color-coded; personalized w/messages, logos, telephone numbers; biodegradeable.

Hughes Aircraft Co. (213) 517-6233

Microwave Comm.
PO Box 2940
Mail Stop 245/2772
Torrance, CA 90509-2940
PERSONNEL: Greg Baer, Product Line Manager; Abe Sonnenschein, Asst. Product Line Manager; L. Eugene Stanley, Marketing Manager; Steve King, Domestic Sales Manager
REGIONAL OFFICES: Arthur Heiny, Eastern Regional Sales Manager, PO Box 89, Deerfield Street, NJ 08313, (609) 455-0111; Robert Stanton, Eastern Regional Sales Manager, PO Box 1482,

Scranton, PA 18501, (717) 343-3564; Norman Woods, Western Regional Sales Manager, Mail Stop 245/2772, PO Box 2940, Torrance, CA 90509, (213) 517-5573; Steve Dozier, Western Regional Sales Manager, 7775 W. Ontario Pl., Littleton, CO 80123, (303) 973-3869.

DESCRIPTION: Hughes Microwave Communications Products offers a complete line of multichannel microwave distribution equipment currently being used to deliver over 100,000 channels of programming to CATV hubs. Equipment includes low, medium and high power microwave systems capable of transmitting 1 to 80 TV channels, FM modulated equipment for interties, and enhancement products for existing systems. New low cost broadband transmitters and on-frequency active repeaters permit cable operators to cost effectively deliver signals to almost any subscriber pocket. Hughes also provides a full line of support services such as system design, field engineering assistance, applications engineering, product support (24-hour service telephone), and training seminars.

Hughes Comm., Inc. (213) 607-4000
1990 Grand Ave.

El Segundo, CA 90245

PERSONNEL: John Koehler, President/CEO; Steven Petrucci, Executive Vice President
DESCRIPTION: Hughes Communications Inc. owns and operates three Galaxy and three Leasat satellites. Galaxy serves the voice, video, and data transmission needs of large corporations, long-haul carriers, cable programmers and broadcasters. Leasat provides worldwide tactical communications service to the U.S. Navy and other agencies of the Department of Defense.

Humphrey Bros., Inc. (602) 878-0633
CATV Const.

8200 N 75th Ave.

Peoria, AZ 85345

PERSONNEL: Doy Humphrey, President
DESCRIPTION: Underground and aerial cable installation.

IFR Systems Inc. (316) 522-4981

10200 W. York St.

Wichita, KS 67215-8935

DESCRIPTION: IFR Systems, Inc. is a manufacturer of communications service monitors, general purpose test equipment and avionics test equipment.

ISS. (415) 853-0833

(Int'l Satellite Systems)

WATS(National). (800) 227-6288

104 Constitution Dr. #4

Menlo Park, CA 94025

PERSONNEL: Norman Gillaspie, President; Lydia Gillaspie, Marketing Director; John Cioro, Eastern Regional Office

DESCRIPTION: ISS Engineering Inc. manufactures and imports commercial satellite receivers, CATV/SMATV modulators, frequency agile processors and low noise amplifiers as well as most headend equipment needed for cable systems.

ITT Cannon. (714) 557-4700

666 E Dyer Road

Santa Ana, CA 92702

PERSONNEL: L. Wayne Oliver, President
DESCRIPTION: ITT Cannon is a worldwide supplier of connectors, interconnection systems and assembly tools. The company's product line encompasses more than 100,000 connector assembly configurations that are used in the computer, telecommunication, medical, aerospace, defense, transportation, broadcast, military and energy industries.

ITW Linx. (312) 296-5469

195 Algonquin Road

Des Plaines, IL 60016

PERSONNEL: Russell Duggan, Manager

DESCRIPTION: Fastening devices. Wire and cable routing and clamping components.

IDEA/ONICS

"IDEAS IN ELECTRONICS"

Idea/onics. (701) 786-3904
Box 224

Mayville, ND 58257

PERSONNEL: Austin Kramer, Manager; Norman Bakken, Engineer

DESCRIPTION: Emergency alert units for CATV and SMATV systems.

Imperial Products. (718) 784-7227
Center, Inc.

50-14 39th Street

Long Island City, NY 11104

PERSONNEL: Charles Mkhitarian, President; Bernard Ashkinazy, Sales Manager

DESCRIPTION: Manufacturer of security devices and the V.I.P. "Videointerphone."

Incospec Electronics. (514) 322-5540

WATS(National). (800) 361-3896
4651 Des Grandes Pariries

St. Leonard, QUE, H1R 1A5

PERSONNEL: Mario Sebastiani, President; Mike Steiner, Vice President; Robert Quintal, CATV Sales

DESCRIPTION: Incospec Electronics is a full line distributor specializing in headend and distribution equipment, satellite uplink and downlink equipment. Incospec also has its own line of subcarrier demodulators, data demodulators, stereo processor and FM agile modulator stereo.

Independence Electronics. (816) 836-1094

119 S. Main

Independence, MO 64050

PERSONNEL: Douglas Jones, President; Colleen Jones, Vice President

DESCRIPTION: Independence Electronics does converter repair. We also tune positive traps for cable systems. We manufacture and design test equipment for the converter repair business, such as a converter test set.

InfoSoft Technology, Inc. (206) 638-2670

12345 Lake City Way NE

Seattle, WA 98125

PERSONNEL: Gloria Doyle, President; Ken Doyle, Vice President

DESCRIPTION: Computer software products designed for character generation. Applications for local origination channels (community access) and cable advertising. Other software products include: cable TV guides, closed circuit displays, VCR controller, temperature display and addressable tap controller software, other software products currently under development.

Information Systems. (305) 753-8220
Development, Inc.

3773 NW 126th Ave.

Coral Springs, FL 33065

PERSONNEL: Paul Barre, President; Steve Reiss, Vice President/Sales Manager

DESCRIPTION: Information Systems Development, Inc. provides an in-house subscriber management and billing system called CableMaster which addresses the areas of customer service, dispatch, billing, trouble-call analysis, addressability, data retrieval, and all other operations of a cable system. A fully integrated financial system is also available. Both run on IBM Systems 36 and 38.

Ingersoll Ind., Inc. (414) 422-1700

PO Box 425

Muskego, WI 53150

PERSONNEL: John Ingersoll, President

DESCRIPTION: Turnkey construction of newly built or rebuilt cable systems.

Inner-Tite Corp. (201) 376-3255

78 Diamond Road

Springfield, NJ 07081

PERSONNEL: George Davis, President; Gene Coll, Product Manager

DESCRIPTION: Manufacture locking devices for pedestals to prevent tampering.

Institute of. (409) 845-6763

Electronic Science

Texas A&M University System

College Station, TX 77843-8000

PERSONNEL: James Wallace, Division Head
DESCRIPTION: The Institute of Electronic Science trains students for positions as technicians in all areas of the electronics industry. Students spend approximately 1,800 hours in the 18-month program learning mathematical analysis, computer technology and logic, microprocessor programming and interfacing, basic and advanced electronics, digital techniques, trouble shooting and data communication. Approximately ½ of the instruction time is spent in laboratory sessions to reinforce the theory classes. Lab sessions cover generic circuits to help students conceptualize the theory. Short courses for upgrading employee skills are also taught on a contract basis.

Integral Corp. (214) 826-0590

WATS(National). (800) 527-2168

1424 Barry Ave.

PO Box 11269

Dallas, TX 75223

PERSONNEL: Jim Gray, President; Dean Taylor, Sales Manager

REGIONAL OFFICES: Represented exclusively by Channell Commercial Corp. (818) 963-1694, In California: (800) 345-3624, Except California: (800) 423-1863.

DESCRIPTION: Integral Corp. specializes in manufacturing continuously extruded CABLECON ® Cable-in-Conduit.

INTERCEPT

Intercept Corp. (201) 279-2544

WATS(National). (800) 233-TRAP

85 5th Ave., Bldg. #16

Paterson, NJ 07524

PERSONNEL: George Abdelmessieh, President; Peter Parikh, Executive Vice President; Kenneth Augustine, Vice President/Sales
DESCRIPTION: Engineers and manufacturers of pay-TV security traps, super traps, tier and multi-channel traps, scramblers, filters, keylock, converters, directional taps, subscriber drop passives and cable speciality products.

Interface Technology Inc.



Interface Technology, Inc.

Interface Technology, Inc. . . . (314) 426-6880

10500 Kahlmeyer Dr.
St. Louis, MO 63132
PERSONNEL: William Canfiels, President; W. Gary Lowe, Vice President; David Young, Sales Manager
DESCRIPTION: Interface Technology makes the TOES systems—Touch-Tone/Voice Response systems that handle the routine calls usually taken by CSRs. Subscribers may key their pay-per-view orders into their touch-tone phones and receive a voice acceptance message. They may also check their account balances and add premium channel service. Technicians may also check in through the system.

Intern'l Electronic (312) 299-0021
Wire & Cable

520 Business Center Dr.
Mt. Prospect, IL 60056
PERSONNEL: Dale Heilenbach, President
REGIONAL OFFICES: 128 6th Ave., City of Industry, CA 91744, (818) 333-8009; 1879 S. Acoma, Denver, CO 80223, (303) 722-6996; 2833 3rd St., San Francisco, CA 94107, (415) 647-5560; 21026 67th Ave. West, Lynnwood, WA 98037; (206) 771-6016.
DESCRIPTION: Manufacture electronic wire and cable, communication and TVRO cables.

Intern'l Optical (617) 778-1442
Telecomm.

720 Main St.
Hyannis, MA 02601
PERSONNEL: Dr. Herb Elion, President/CEO; Sheila Thall, Senior Vice President; Dr. Glenn Elion, Vice President/Engineering
DESCRIPTION: Network designers and consultants. High resolution and standard voice, video and data. Networks and wide area networks. Specialists in satellite/fiber optics, and laser disk networks.

International Technology (609) 848-3627
Group, Inc.

877 Kings Highway
Woodbury, NJ 08096
PERSONNEL: Paul Goldy, Sr., President; Jake Merriwether, Vice President; Tom Polacek, Vice President; Richard Grace, Vice President
REGIONAL OFFICES: Kungsgatan 8, S-11143 Stockholm, Sweden; 3737 Birch St., Suite 214, Newport Beach, CA 92660
DESCRIPTION: Total management information solution for the cable TV office. Components include computerized billing, general accounting, order entry, inventory control and marketing analysis. Choice of either a self-contained office system or service bureau. All hardware, software and maintenance provided for one cost. System interfaces with IBM PC or similar hardware to provide automatic retrieval of management information.

Interstate Cable (813) 377-5343
Enterprises, Inc.

WATS(State) (800) 282-3952
6111 Porter Way
PO Box 10158
Sarasota, FL 34278
PERSONNEL: N. Lindberg, President; B. Lindberg, Vice President; W. Lindberg, Vice President
DESCRIPTION: Suppliers for CATV and SMATV

systems. Installers of drop material, safety equipment, test equipment and speciality products.

Interstate Dropline (201) 535-9798
Installers, Inc.

PO Box 128
Livingston, NJ 07039
PERSONNEL: Philip Collins Sr., President; Jerry Rufft, Operations Manager
DESCRIPTION: Supplier of contract installations throughout the United States... providing drop installations, churn/service work, trapping, audits, MDU overwires, sales and marketing, collections, converter recovery, and drop rebuilds. Turnkey service available.

Intrastellar (312) 658-0300
Electronics, Inc.

200 Berg St.
Algonquin, IL 60102
PERSONNEL: Mike Platadis, Accounts Representative; Mary LaLoggia, Accounts Representative
DESCRIPTION: Authorized repair facility for CATV converters, line equipment and headend equipment. Full service brokerage facility for all CATV equipment.

Inventronics, Ltd. (204) 728-2001
1420 Van Horne Ave. E

PO Box 1135
Brandon, Manitoba, R7A 6A4
PERSONNEL: G. Thompson, President; Barry Beaudry, Sales Manager
DESCRIPTION: Custom manufacture of sheet metal housings for telecommunications, power and electronic equipment.

Irwin Industries Inc. (213) 595-4747
2679 Redondo Ave.

Long Beach, CA 90806
PERSONNEL: Joe Crabtree, General Manager; Dennis O'Brien, Installation Manager; Sandy Sanders, Projects Manager
REGIONAL OFFICES: Communications Division, Corporate Office, 2679 Redondo Ave., Long Beach, CA 90806, (213) 595-4747; Communications Division, 3249 Cherry Ave., Long Beach, CA 90807, (213) 427-8534 Ext. 247; Communications Division, 2004 Colorado Blvd., Eagle Rock, CA 90041, (213) 257-2471; Communications Division, 11901 Westminster Ave., Ste. H, Garden Grove, CA 92643, (714) 554-5171.
DESCRIPTION: "Committed to service excellence." Customer installations, multiple dwelling units, plant construction and maintenance. Additional services: Engineering, RF Design, project management, equipment brokerage, rent a technician service, teleconferencing.

Irwin Utilities (813) 376-1587
PO Box 30

New Port Richey, FL 33552
PERSONNEL: G. Irwin, President; H. Spear, Vice President
REGIONAL OFFICES: 934 E Centerville Road, Garland, TX 75041, (214) 271-9641; 2649 S Parklane, Hallandale, FL 33009, (305) 981-9116; 9523 Lee Hwy., Fairfax, VA, (703) 591-0139.
DESCRIPTION: Underground, aerial, post- and pre-wire, splicing, activation and complete turnkey construction operations.

Island Cable Electronics (516) 931-8484
WATS(National) (800) 431-5433

49 Bloomingdale Road
Hicksville, NY 11801
PERSONNEL: David Cohen, President; Toni-Ann Caferra, National Sales Manager; Joe Oliva, Director of Operations
DESCRIPTION: Distributor of cable TV converters, descramblers, line equipment and amplifiers, new and reconditioned. Also converter and line

equipment repair.

J.B. Emerson & Assoc. (215) 367-2981
345 Thrush Dr.

Gilbertsville, PA 19525
PERSONNEL: James Emerson, President
DESCRIPTION: Engineering services for digital, microwave and cable TV systems.

JFW Industries, Inc. (317) 887-1340
FAX (317) 881-6790

TLX 5706003630
5134 Commerce Square Dr.
Indianapolis, IN 46237
PERSONNEL: Joetta Walker, Co-Owner; Fred Walker, Co-Owner; Jaqueline Buescher, Inside Sales
DESCRIPTION: Manufacturer of attenuators and switches. Specialize in custom designs of 50 Ohm and 75 Ohm units.



JGL Electronics Inc. (317) 783-6130
4425 Blackstone Dr.

PO Box 516
Indianapolis, IN 46237
PERSONNEL: Judy Duke; Grady Cox; Larry Wyndell
DESCRIPTION: JGL Electronics, Inc. specializes in the repair and calibration of CATV test equipment including all makes and models of signal level meters and sweep recovery systems. JGL also buys and sells used test equipment and carries a large inventory of spare parts and replacement batteries. Average repair turn around is 2-3 days. Manufacturers serviced: Wavetek, Midstate, Texcan, Sadelco, Avantek and more.

JI Case Company (414) 636-6011
700 State St.

Racine, WI 53404
PERSONNEL: Jerome Green, President; John Borden, Executive Vice President/Marketing; John Gleason, Senior Vice President/Sales & Marketing; John Boylan, Executive Vice President/Manufacturing; Jack Michaels, Executive Vice President/Planning & Eng.
DESCRIPTION: Manufacturer of construction equipment—trenchers, cable layers loader/backhoes forklifts, skid steer loaders, wheel loaders, crawlers, loaders and dozers excavators.

Jackson Enterprises (513) 836-2641
4 Jacks Lane

PO Box 6
Clayton, OH 45315
PERSONNEL: Richard Jackson, Owner
DESCRIPTION: Manufacturer of the Jackson Tool System of CATV aerial construction and installation tools. Services include: strand mapping, make-ready surveys, as-built maps, customer audits, and all related mapping and design services.

Jacobs Trenching Mfg. (803) 756-6400
Route 2, Box 357

PO Box 517
Loris, SC 29569
PERSONNEL: Jimmie Jacobs, Manager
DESCRIPTION: Two trenchers available for trenching needs. One small trencher 7' deep, and one commercial heavy duty 12' deep.

Jampro Antenna (916) 383-1177
PO Box 28425

Sacramento, CA 95828

PERSONNEL: James Olver, President; Alex Perchevitch, Vice President; Bill Cunningham, Sales Manager
DESCRIPTION: Full line of high quality TV and FM transmitting antennas plus transmission line accessories and combiner, filters, etc.

Jensen Tools, Inc. (602) 968-6241
 WATS(National). (910) 950-0115
 7815 S 46th St.
 Phoenix, AZ 85044
PERSONNEL: Uma Aggarwal, President; Bill Hewitt, Sales Manager
DESCRIPTION: Supplier of tools, tool kits, tool cases and test equipment to the cable TV and communication industries.

GENERAL INSTRUMENT

Jerrold/General Instrument. . . (215) 674-4800
WATS(National). (800) 523-6678
WATS(State). (800) 562-6965
 2200 Byberry Road
 Hatboro, PA 19040
PERSONNEL: George Safiol, Sr. Executive Vice President-C.O.O.; Frank Drendel, Executive Vice President; Hal Krisbergh, Vice President-GM, Sub. Systems Div.; Bill Lambert, Vice President-GM, Dist. Systems Div.; Larry Fry, Vice President-Sales
REGIONAL OFFICES: 767 Fifth Ave., 45th Floor, New York, NY 10153, (212) 207-6300; 2611 Westgrove Road, Ste. 109, Carrollton, TX 75006, (214) 248-7931; 7100 E. Belleview Ave., Ste. 101, Englewood, CO 80111, (303) 740-6118; 595 Tamarack Ave., Unit "C", Brea, CA 92621, (714) 671-1500.
DESCRIPTION: Designer and manufacturer of full line electronic CATV, TVRO and SMATV equipment. Distribution systems: conventional, feedforward, power-doubling and Quadrapower™ amplifiers, taps and passives and accessory equipment; subscriber systems: plain, pay and addressable converters, subscriber push button response systems, addressable controllers and scrambling equipment; headend systems: MATV and CATV satellite receivers, frequency agile headend modulators and encoders, stereo encoders; local area network: broadband distribution equipment, advanced status monitoring and point-to-point broadband modems.



Jerry Conn Associates, Inc.

Jerry Conn Assoc., Inc.. (717) 263-8258
WATS(National). (800) 233-7600
WATS(State). (800) 692-7370
 130 Industrial Dr.
 PO Box 444
 Chambersburg, PA 17201
PERSONNEL: Thomas Carbaugh, President; David Showalter, Sales Manager; Sherri Nitterhouse, SMATV Sales Rep.
DESCRIPTION: Manufacturer's representative and distributor for many products in the CATV/SMATV industry; everything from drop materials to headend electronic and test equipment.

JOHNSON CONTROLS

Johnson Controls Inc.. (414) 961-6500
Battery Division
 900 E. Keefe Ave.
 PO Box 591 (zip 53201)
 Milwaukee, WI 53212
DESCRIPTION: Manufacture gelled and wet stationary batteries. Designs for special applications upon request.

Joslyn Corp.. (312) 625-1500
 9200 W Fullerton Ave.
 Franklin Park, IL 60131
PERSONNEL: John Combs, Customer Service Manager
REGIONAL OFFICES: 407 113th St., Arlington, TX 76011, (817) 633-1255; 2222 Vanderbilt Road, Birmingham, AL 35243, (205) 841-6491; 3700 S. Morgan St., Chicago, IL 60609, (312) 927-1420; PO Box 88926, Seattle, WA 98188, (206) 251-6170; 1718 Jasper St., PO Box 12497, North Kansas City, MO 64116, (816) 471-6647; 15613 Blackburn Ave., Norwalk, CA 90650, (213) 921-2289; 2110 Tomlynn St., PO Box 6913, Richmond, VA 23230, (804) 353-9151.
DESCRIPTION: Offers a complete line of anchoring equipment, guy support, poleline hardware, installation equipment and pole reinforcing systems.

K & B Contractors. (918) 582-4990
 Box 4498
 Tulsa, OK 74159
PERSONNEL: James Bolton, Owner
DESCRIPTION: Engaged in construction of aerial and buried CATV projects; including turnkey construction and engineering. Construction area includes all portions of the U.S. and past experience of contractor consists of an excess of 100 REA financed and completed projects in buried telephone systems. Completed projects exceed \$60 million.

K & B Engineering. (714) 250-4563
 WATS(State). (800) 624-2381
 1720 E. Gary St., Suite 207
 Santa Ana, CA 92705
PERSONNEL: Tony Bykerk, President; Stewart McCausland, Vice President
DESCRIPTION: Strand mapping, make ready engineering, underground layout and permits, system walkout.

KES. (800) 682-7140
 (Klungness Electronic Supply)
 WATS (State). (800) 338-9292
 107 Kent St.
 PO Box 885
 Iron Mountain, MI 49801
PERSONNEL: Mike Amicangelo, Sr. Account Executive
DESCRIPTION: Distributor of RF electronics cable hardware, antennas, tools, safety equipment, test equipment, headend equipment and earth stations.

KMP Computer Systems. (505) 662-7700
 2075 Trinity Dr.
 Ste. 100
 Los Alamos, NM 87544
PERSONNEL: Eldon Pequette, President Sales Manager
DESCRIPTION: CABLESTAR-single and multi-station in-office computer systems provide order entry, billing, accounts receivable, inquiry, marketing, and management reporting for cable TV offices.

Kanematsu-Gosho. (201) 271-7544
 (USA) Inc./Sprucer
 400 Cottontail Lane
 Summerset, NJ 08873
PERSONNEL: Y. Tanaka, President; Y. O'Hara, Vice President; Ken Ogiso, Sales Manager/ Electronics; Neil DeCostanza, Manager/Sales & Marketing
DESCRIPTION: Sprucer, two-way interactive addressable baseband converter system and related headend equipment complete with hand-held remote (IR) control unit for complete subscriber/CATV system interaction for pay-per-view requests/ authorization, opinion polling, shop at home, program and channel authorization (upgrades and downgrades) and parental guidance 4-level control input via a 3-digit subscriber code. Converters include the Sprucer 300 for residential installation and the Sprucer 310 for resort/hotel/motel installations. The Sprucer 310 allows for credit card billing. The Sprucer system also offers viewer statistics and a true billing interface.

Kaul Tronics. (608) 647-8902
 Route 2, Hwy. 14 E
 PO Box 637
 Richland Center, WI 53581
PERSONNEL: John Kaul, President; Mary Kaul, Vice President; Ron Halverson, Vice President/ Production; Jim Atkinson, Vice President/ Marketing
DESCRIPTION: Manufacture stainless steel dishes in sizes of 66", 90", 112" diameters. Manufacture mesh dishes 6', 8', 9', 10', 10 1/2' and 16'. Manufacture KU mesh antennas.

Keiser Engineering Inc.. (702) 281-9582
 2046 Carrhill Road
 Vienna, VA 22180
PERSONNEL: Bernhard Keiser, President
DESCRIPTION: Keiser Engineering Inc., provides consulting engineering and feasibility studies in wideband communication systems, including analog and digital video, both standard and high resolution and high-speed data transmission. Work includes both fiber optic and coaxial transmission, as well as satellite links.



Kennedy Cable. (912) 557-4751
Construction, Inc.
WATS(State). (800) 841-4361
 Hwy. 280 W
 PO Box 760
 Reidsville, GA 30453
PERSONNEL: Roger Kennedy Jr., President; Robert West, Vice President; Bob Skelton, Vice President
REGIONAL OFFICES: Florida, (813) 439-3621.
DESCRIPTION: Aerial and underground line construction services, splicing and balance, strand mapping, engineering and design, splicing upgrades and rebuilds.

Kings Electronics Co. Inc.. (914) 793-5000
 40 Marbledale Road
 Tuckahoe, NY 10707
PERSONNEL: Fred Lorge, President; Oscar Wayne, Vice President Finance; Ed Corcoran, Vice President/ Sales
DESCRIPTION: Manufacturer of coaxial connectors.

Kinsman Design. (303) 793-0649
 Associates, Inc.

Klein Tools Inc.

8140 E Phillips Ave.
Englewood, CO 80112
PERSONNEL: Sally Kinsman, President
DESCRIPTION: Consulting engineering company providing broadband electronic system design for cable television operators and manufacturers, plus SMATV and LAN systems. Utilize Wang MVP computer system with proprietary software. Capable of designing with any combination of frequency and equipment, and adapting to any drafting symbols. Also draft strand maps.

Klein Tools, Inc. (312) 677-9500
7200 McCormick Blvd.
Chicago, IL 60645
DESCRIPTION: Major manufacturer of hand tools, splicing tents, and occupational protective equipment.

Knight Construction Co. (313) 689-4030
1931 Austin Ave.
Troy, MI 48083
PERSONNEL: S.K. Knight, President; J.C. Hanley, Executive Vice President
DESCRIPTION: Installs turnkey underground cable systems. Has installed over 2,000 miles of underground CATV in the last six years.

Knox Video. (301) 840-5805
8547 Grovemont Cr.
Gaiphersburg, MD 20877
PERSONNEL: Philip Edwards, President; Roland Blood, Vice President/Sales Manager
DESCRIPTION: Manufacturer of professional quality, low and mid priced full-function character generators.

L & R Comm. Ltd. (712) 252-4101
WATS(National). (800) 831-0974
2301 Bridgeport Dr.
Sioux City, IA 51102
PERSONNEL: Don Cuthbertson, President; Ron Gibbs, Vice President; Dennis Harward, Sales Manager
DESCRIPTION: Communications cellular microwave, two-way towers, fiberglass, aluminum, rhinohide, steel pre-assembled shelters.

LANetco Group. (404) 263-8082
6165 Crooked Creek Road
Norcross, GA 30092
PERSONNEL: Charles Fish, President; James Krieger, Vice President
DESCRIPTION: Engineering, design and installation of local area networks.

LDM, Inc. (818) 967-1506
529 S Second Ave.
Covina, CA 91723
PERSONNEL: Rick Brutocao, President
DESCRIPTION: SAS, Subscriber Management System, was designed to be flexible. SAS meets the operational requirements of small, intermediate and large pay TV systems. Logical Data Management, a professional computer software company, understands your business needs. Logical Data Management is teamed with Burroughs Corporation, a computer company respected for its commitment to excellence. Through Logical Data Management, Burroughs has extended this commitment to the pay TV industry. SAS is staffed to be responsive to changing technologies and the volatile business conditions which impact the industry daily. A major business concern of today's pay TV operator is the ability to control churn and spin. SAS delivers a series of statistical reports that helps the operator to understand subscriber movement; disconnects, laterals, spins and upgrades. LDM and Burroughs are committed to delivering a product that is flexible and responsive.

LNR Comm., Inc. (516) 273-7111
180 Marcus Blvd.
Hauppauge, NY 11788

PERSONNEL: S. Okwit, President; F. Arams, Vice President/Marketing; E. Salamone, Vice President/ Administration; P. Lombardo, Vice President/ Engineering; H. Okean, Vice President/R&D
DESCRIPTION: Manufacturer of telecommunications equipment for satellite earth stations including low noise amplifiers, FM/FDM, video receivers and exciters, audio subcarriers, MODS/DEMOS, FM Modems, filters/equalizers, up/down converters, loop, test translators, and spacecraft communications subsystems.



LRC Electronics, Inc. (607) 739-3844
PO Box 111
Horseheads, NY 14845
PERSONNEL: John McQuaid, Vice President/ General Manager; Ed Eschliman, Marketing Manager; Len DeRenzo, Sales Manager
DESCRIPTION: A complete line of connectors for cable TV, products vary from F fittings to hard line aluminum entry and splices. Also miscellaneous aluminum connectors such as housing splices and angle connectors. Also heat shrink and cable kits including jumper assemblies along with active and passive electronics. Signal leakage detection equipment, traps and BNC connectors.

La Kart Corp. (617) 244-6881
287 Grove St.
Newton, MA 02166
PERSONNEL: James Herlihy, President; Larry Silverman, Engineering Manager; Michael Carozzi, Sales Engineer
DESCRIPTION: Providing commercial insertion systems, pay-per-view systems, traffic systems, automated tape library systems and complete hub studio systems.

Laird Telemedia. (801) 972-5900
2424 S. 2570 West
Salt Lake City, UT 84119
PERSONNEL: William Laird, President; Mike Janko, General Manager
DESCRIPTION: Manufacture character generators and telcecin equipment.



Lakeshore Cable. (616) 759-4594
Contractors, Inc.
851 W. Laketon Ave.
Muskegon, MI 49441
DESCRIPTION: Aerial and underground construction, rebuilds, upgrades, strand map and design, as-built design, apartment post and prewires, complete residential box conversion programs, radiation and CLI, audits, drop transfers, splicing, drop installations and complete tap cap installation program.

Lance Industries. (818) 367-1811
13001 Bradley Ave.
PO Box 4156
Sylmar, CA 91342
PERSONNEL: Milton Mann, President; Joe Barris,

Vice President; Richard Mann, Exec. Vice President
REGIONAL OFFICES: 4440 N. Clark St., Chicago, IL 60640, Jim Moon, Eastern Plant Manager.
DESCRIPTION: MMDS/ITFS, STV, true satellite antenna, Colormaster outdoor TV/FM antennas, Colormaster indoor antennas, Colormaster rotators, True View outdoor TV/FM antennas, Video Master video control centers, Lance packaged TV accessories, Lance packaged video accessories, Lance packaged telephone accessories, Lance packaged audio accessories, Royaltel masting-5',10' and telescoping, Lance TV and rotor wire, Lance bulk hardware and guy wire.

Larson Electronics. (817) 387-0002
311 S Locust
Denton, TX 76201
PERSONNEL: Ernie Larson, Owner
DESCRIPTION: Power equipment for all CATV systems.

Leader Instruments Corp. (516) 231-6900
WATS(National). (800) 645-5104
380 Oser Ave.
Hauppauge, NY 11788
PERSONNEL: S. Hirota, President; B. Storch, Vice President/Sales; R. Sparks, Director/ Marketing
REGIONAL OFFICES: 20909 Western Ave., Torrance, CA 90501, (213) 618-0695.
DESCRIPTION: Electronic Test Instrument—CATV/MATV field level meter, oscilloscopes, digital storage oscilloscopes, color bar pattern generators, wave form monitors, vectrosopes (NTSC, PAL and SECAM), programmable video generator, instrument carts, frequency counters and sweep function generators.

Leaming Industries. (714) 979-4511
180 McCormick Ave.
Costa Mesa, CA 92626
PERSONNEL: James Leaming, President; Robert Leaming, Vice President; Keith Rauch, Senior Engineer; Kim Litchfield, Sales
DESCRIPTION: Audio transmission equipment for satellite cable and broadcast. Our product line includes STL and SCPC equipment, stereo processors, BTSC generators and audio automatic gain control amplifiers.

Lectro Products, Inc. (404) 353-1159
WATS(National). (800) 551-3790
420 Athena Drive
PO Box 567
Athens, GA 30603
PERSONNEL: Michael Filkins, Vice President/ General Manager; Steven Wagner, Vice President/ Marketing
DESCRIPTION: Supplier of standby power supplies and ferroresonant power supplies of CATV and LAN distributions systems.

Leitch Video. (804) 424-7920
of America Inc.
825 K Greenbrier Circle
Chesapeake, VA 23320
PERSONNEL: John Walter, President; William Thompson, Vice President; Bob Henson, Marketing Manager; Gary Stephens, Technical Support/Sales
DESCRIPTION: Manufactures video sync generators, vertical interval inserters, video processors, video test signal generators, video equalizing, clamping and delay amplifiers, audio distribution amplifiers, master clock systems and high security video/audio scrambling systems. Manufactures of both 8 and 9 bit frame synchronizers and the Still File, a still store system capable of managing up to 10,000 slides.

Lemco Engineers, Inc. (314) 576-5950
11933 Westline Industrial Dr.
St. Louis, MO 63146
PERSONNEL: W. Sebastian, President; J. Orr, Vice President
REGIONAL OFFICES: 8402 Laurel Fair Circle,

Ste. 109, Tampa, FL 33610, (813) 623-1575; 6610 Harwin, Ste. 278, Houston, TX 77036, (713) 789-2545; Ste. 500, 1178 Grimes Bridge Road, Roswell, GA 30075.
DESCRIPTION: Feasibility studies, system design and strand mapping.



LEMCO TOOL CORP.

Lemco Tool Corp. (717) 494-0620
WATS(National). (800) 233-8713
 RD #2
 Box 330A
 Cogan Station, PA 17728
PERSONNEL: Glenn Miller, President
DESCRIPTION: Designer and manufacturer of mechanical tools, equipment and material for the construction and maintenance of cable TV systems.

Lenco Inc. (314) 243-3147
 Electronic Division
WATS(National). (800) 325-8494
 300 N. Maryland St.
 PO Box 348
 Jackson, MO 63755
PERSONNEL: Jerry Ford, CEO/Chairman of the Board; Donald Ford, Executive Vice President; Bruce Blair, Vice President/Engineering; Von Haney, National Sales Manager; Paul Gerlach, Vice President/General Manager
REGIONAL OFFICES: 10 Stokes Road, Vincentown, NJ 08088, (609) 953-9101; 5901 Spanish Moss Ct., Mobile, AL 36609, (205) 660-0738; 27040 Rio Prado, Valencia, CA 91355, (805) 297-1060; 6552 Murray Ave., #1, Cincinnati, OH 45227, (513) 561-4484.
DESCRIPTION: Manufacturer of video terminal equipment including video test generators, system timing, video & pulse distribution, processing, encoding & decoding equipment, video noise, meters, B&W monitors, audio distribution.

Lightning Deterrent Corp. (312) 434-7912
WATS(National). (800) 241-2960
 5321 S. Kedzie Ave.
 Chicago, IL 60632
PERSONNEL: Donald Hudalla, President
DESCRIPTION: Manufactures and services Verda lightning deterrent units for use on communication towers and buildings. It is the only one of several patented lightning deterrents which uses a set number of points, usually 40 or more per square inch.

Lightning Electric. (717) 533-4983
 of PA Inc.
 RD 1
 Box 148-B
 Hershey, PA 17033
PERSONNEL: Joann Brong, President; Anthony Brong, GM/Lightning Elec. of PA Inc.; Paul Light, GM/Walton Towers
REGIONAL OFFICES: Walton Tower Inc., Road 1, Box 148-B, Hershey, PA 17003 (717) 533-4983; SE Cable Construction Corp., PO Box 177, Callahan FL 32011, (904) 879-1311.
DESCRIPTION: Construction services including new, rebuild, line extension, underground and tower work, also pole line, hardware, tap, traps and filters and house drop. installations, consultants in engineering, finance, earth stations, strand mapping and surge protection.

Lightning Eliminators. (213) 946-6886
 & Consultants
 13007 Lakeland Road

Santa Fe Springs, CA 90670
PERSONNEL: Roy Carpenter, President; E. Alvin Rich, Exec. Vice President/Marketing-Sales
DESCRIPTION: Provides an engineering service (system design, lightning prevention, power conditioning and grounding systems). Also a manufacturer of lightning strike prevention systems, chemically activated ground rods and lightning and tornado warning systems. In addition, carry specialized forms of power protection and conditioning systems. Product lines are: Dissipation Arrays (DA)-prevent lightning strikes to towers, tanks, buildings and complete facilities. Chem-ROD (CR)- a rechargeable chemically activated grounding electrode which provides much lower grounding resistance than other chemically charged or conventional rods in identical soil. Lightning Warning Systems (LWS)-senses the local electrostatic voltage level and warns of impending danger.



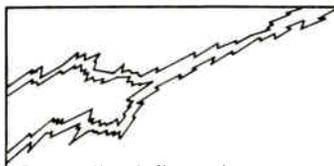
Lindsay Specialty (705) 324-2196
Products Ltd.
 50 Mary St. W
 Lindsay, Ontario, K9V 4S7
PERSONNEL: John Anderson, President/CEO; Roy Price, Sr. Vice President; Dave Atman, Sales Manager; Don Stirling, Sales Manager
REGIONAL OFFICES: Head End Co., 2690 Sawbury Blvd, Worthington, OH, 43085, (614) 766-0874; Signal Vision, 3 Wrigley, Irvine, CA

92718, (714) 568-3196; ADCOM, 1613 S. Murray Blvd., Colorado Springs, CO 80916, (303) 596-4464; M&E Assoc., 215 W. Washington, Fergus Falls, MN 56537, (218) 739-8405; Jim Morton & Assoc., 1956 Reservoir Dr., Carlisle, PA 17013, (717) 243-4653.
DESCRIPTION: Lindsay is a quality manufacturer of CATV equipment and has been established for over 30 years. We specialize in system requirements for small, medium and large builds and rebuilds. Systems benefit from our wide range of trunk amplifiers, line extenders, apartment amplifiers, system passives and directional multitaps. Connectors and drop materials, coupled with full headend surveys and commercial antennas of superior quality, complete our line.

Line Ward Corp. (716) 675-7373
 157 Seneca Creek Road
 Buffalo, NY 14224
PERSONNEL: E. Ward, President
DESCRIPTION: The L-1 Cable line layer was designed expressly for installing house drops at depths for six to 13 inches. Our new entry, the L-2 Cable line layer is designed for tough going at depths of six to 16 inches. Both have tracks to achieve minimal lawn damage and maximum traction.

Linnea Co. Inc. (609) 758-8227
 Route 2, Box 45
 Wrightstown, NJ 08562
PERSONNEL: Mike Cannon, President; Duane Havens, Service Manager
DESCRIPTION: We are in the business of remanufacturing cable equipment-converters, line equipment etc. We also repair RF and other modules.

Lowe's Construction Co. (214) 398-0725
 1624 Murdock Road
 Dallas, TX 75217



Prevention is the only protection
 Lightning rods attract lightning—that's their function. The only sure protection is to prevent the lightning from striking the structure and damaging the installations inside. That's what the VERDA Lightning Deterrent does—it gives you protection from all lightning-associated problems by deflecting lightning. A positive corona is formed which deters positive lightning energy. The VERDA Lightning Deterrent can be applied in all situations requiring lightning protection—

Communications systems—
 —microwaves—two-way radio
 —TV—FM—Nurad antennas
 —boats—police and fire stations—ambulances—
 —telephones—trucks—
 It's round-the-clock protection against lightning. This system has been storm-tested on the highest structure in the world.

Lightning Deterrent Corp.
 5321 South Kedzie Avenue
 Chicago, Illinois 60632
 (312) 434-7912
 1-800-241-2360, ext. 532

The Proven Lightning Deterrent!



Lynn Telecomm Inc.

PERSONNEL: Mary Gonzales-Lowe, Owner
DESCRIPTION: All phases of CATV construction, specializing in boring and trenching.

Lynn Telecomm., Inc. (216) 274-3116
 PO Box 370
 Mantua, OH 44255
PERSONNEL: Lynn Westover, President
DESCRIPTION: CATV engineering consulting firm offering expertise in areas such as: system operations, new construction, system rebuilds, SMATV systems, turnkey services, system engineering and design, fiber optics, feasibility studies, system development and analysis, etc. Currently operating a cable system.

M/A-COM Inc. (617) 272-3000
 7 New England Executive Park
 4th Floor
 Burlington, MA 01803
DESCRIPTION: Manufacturer of antennas, earth stations and other electronics through 21 subsidiaries.

M/A-COM MAC Corp. (617) 272-3100
 5 Omni Way
 Chelmsford, MA 01824
PERSONNEL: Tom Leonard, President; Dave Erikson, National Sales Manager
DESCRIPTION: Microwave equipment and service point-to-point microwave importation systems, local origination, pick-ups and FM multi-channel microwave distribution systems.

M/A-COM Telecomm. (301) 428-5500
 11717 Exploration Lane
 Germantown, MD 20874
PERSONNEL: Jack Shaw, President; Pradman Kaul, Vice President; Frank Baker, Dir. of Marketing Comm.
DESCRIPTION: Distributors and manufacturers

of state of the art telecommunication products and systems.

MAAST Inc. (213) 207-5310
 12401 W Olympic Blvd.
 Los Angeles, CA 90064
PERSONNEL: Robert Block, President
DESCRIPTION: Multiple Application Addressable Secure Television (MAAST) encoding/decoding systems are designed and distributed. Features include 5 in-band audio channels per video, parental control, remote control, high security, addressability, impulse pay-per-view for one way systems and much more.

MAI Comm., Inc. (609) 547-1600
 WATS(National). (800) 624-2288
 141 Shreve Ave.
 Barrington, NJ 08007
PERSONNEL: Thomas Girard, President; Robert Mai, Jr., Vice President/Operations; Barbara Kemery, Vice President/Finance; David Mai, Vice President/Construction; Kenneth Settar, Account Executive
DESCRIPTION: Complete turnkey operation, converter repair, consulting, strand mapping, fiber optic construction, system engineering, design, equipment evaluation, engineering training and two way activation.

MECUM Enterprises Inc. (714) 598-1182
 1135 Centre Dr.
 Unit F
 Walnut, CA 91789
PERSONNEL: Delbert Mecum, President; Jan Van Greuningen, Sr. Vice President/Western Operations
REGIONAL OFFICES: 2568 Valleyview, Troy, MI 48098, (714) 598-1182.
DESCRIPTION: We specialize in underground and aerial construction of all CATV systems, including new build and rebuilds. Our attention to detail is your guarantee for excellence.

MICO Inc. (507) 625-6426
 1911 Lee Blvd.
 Mankato, MN 56001
PERSONNEL: G. McGrath, President; Daniel McGrath, Vice President; Fred Cords, Vice President
DESCRIPTION: Manufactures hydraulic brake systems and components: hydraulic brake locks and throttle controls.

MICR Data Systems Inc. (212) 509-2376
 47 West St.
 New York, NY 10006
PERSONNEL: Richard Zoch, President; Vivian Cantor, Sales
DESCRIPTION: We have specialized in automatic subscriber payment service for the past 12 years. If you have difficulty collecting your fee on time and find the cost of billing and reminders high, let MICR Data Systems do it for you via preauthorized checking.

MIRA Corp. (517) 337-1525
 PO Box 23037
 Lansing, MI 48909
PERSONNEL: James Dinkelacker Ph.D., CEO; Kimberly Downing, President
DESCRIPTION: A media research company, we do full service media and marketing research, and specialize in quantitative and qualitative applications.

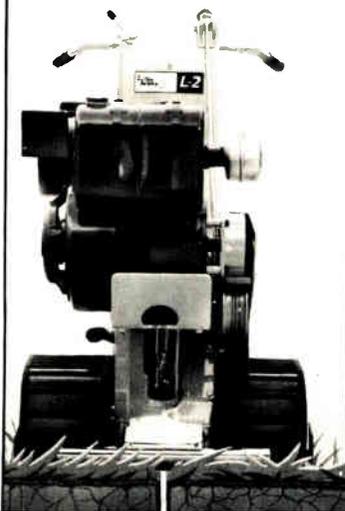
MLE/Main Line. (213) 715-6518
 Equipment Co.
 1650 W. 180th St.
 Gardena, CA 90248
PERSONNEL: Mark Lipp, President; Howard Lipp, Vice President-Engineering; Don Beaupre, Vice President-Sales
DESCRIPTION: Brokers of used converters and line equipment. Distributor of national products, representing Cedemco-closed caption decoders for the hearing impaired, PPC-connectors and traps, Moore-security boxes and Riser Guard. Falcone International Inc.-ad insertion equipment and ISS Engineering.

MUC Tele-A-Cable. (612) 421-5111
 Communications, Inc.
 WATS(National). (800) 328-2220
 PO Box 127
 Anoka, MN 55303
PERSONNEL: Charles Lundgren, President; Stanley Lebakken, CFO; John Pietri, Operations Manager
DESCRIPTION: CATV and telephone construction including: aerial and underground, residential and MDU installation, engineering, CATV and telephone design, fiber optic construction and splicing, manhole and conduit construction.

TOUGH

OUR LINE-WARD L-1 & L-2 MODELS ARE BUILT TO TAKE IT

- Just 25" Wide
Easy Going Between Shrubs & Fences
- Compact Size—With Strength That Won't Quit
800 Lb. Total Weight With 16 Hp Kohler Engine
- Up To 16" Depth
- Superior Traction
Moves On Tracks, Reduces Lawn Damage
- All-Mechanical Drive
For Top Performance
No Recurring Oil Leaks



WITH SOME VERY REAL PLUSES:

- Turns On A Dime
- Imparts Vibration To Ground, Not The Operator
- Low Maintenance & Downtime

SEE FOR YOURSELF

Call For A Free On-Site Demonstration Or, Write For Our Color Brochure.



Line-Ward Corp.
 157 Seneca Creek Road
 Buffalo, New York 14224
 (716) 675-7373



Magnavox CATV Systems, Inc. (800) 448-5171
 WATS(State). (800) 522-7464
 100 Fairgrounds Dr.
 Manlius, NY 13104
PERSONNEL: D. Horowitz, Chairman; R. Roscher, President; K. Weil, Marketing Manager; M. Senken, Controller; R. Finnerty, National Sales Manager
DESCRIPTION: Manufacturers of a full line of amplifiers in 330, 450, 550 & 600 MHz configurations, including feedforward, powerdoubling and conventional technologies, line extenders. Also available: headend equipment,

WITHOUT THE BULK

digital systems sentry, subscriber passives, connectors, taps (2, 4 & 8 way), and local area networks.

Malarkey-Taylor Assoc. Inc. (202) 737-2300
 WATS(National). (800) 424-8036
 1301 Pennsylvania Ave. N.W.
 #200

Washington, DC 820004
PERSONNEL: Martin Malarkey, President/CEO; Archer Taylor, Sr. Vice President/ Engineering; James Kearney, Director of Engineering; David Coe, Engineering Associate; James Cuddihy, Engineering Associate
DESCRIPTION: Cable television engineering consulting firm. Services include expert testimony, due diligence for investors and lenders, evaluation of products and systems, planning and cost analysis, operations review (Proof of Performance), regulatory technical compliance requirements, problem solving, fiber optics, electronic paging systems, system construction supervision, management/operations audit, customer service training, short term contract management agent and specialized one-time services.

Maple Leaf Comm. Inc. (516) 728-1070
 205 W Montauk Hwy.
 Hampton Bays, NY 11946
PERSONNEL: John Sheehan, President
DESCRIPTION: Complete construction of cable TV systems including sweep and proof of performance tests. We specialize in rebuilds with six years experience in that area.

Mark Antenna Products Inc. . . (312) 298-9420
 2180 S Wolf Road
 Des Plaines, IL 60018
PERSONNEL: Richard Thomas, President; Robert Pevenstein, Vice President; Alan Crego, Sales Manager
DESCRIPTION: Manufacturers 3, 4, and 5 meter "C" band earth station antennas. 1.0 meter to 3.7

meter "KU Band" earth station antennas. Manufacturer of microwave point to point communications antennas.

Marmax Sales. (414) 272-4048
 Division of World Products
 623 W Vliet St.
 Milwaukee, WI 53212
PERSONNEL: Steven Lees, President; Frank Zinner, General Manager
DESCRIPTION: Marmax Sales (Division of World Products Inc.) is a wholesale distributor of MDS-STV-CATV equipment.

Mastercom. (301) 469-6688
 7536 Spring Lake Dr.
 Bethesda, MD 20817
PERSONNEL: O. Page, Owner
DESCRIPTION: Design, furnish, install and maintain CATV, SMATV, CCTV, security, communications systems. Local distributor for leading product lines, make-ready engineering, site surveys, rebuilds and up-grades.

Matrix Test Equipment Inc. . . (201) 469-9510
 200 Wood Ave.
 Middlesex, NJ 08846
PERSONNEL: Jack Kouzoujian, President/Sales Manager
DESCRIPTION: Manufacture test equipment primarily cross modulation and inter-modulation.

McCullough Satellite. (501) 895-3167
 Equipment Inc.
 HC 87, Box 97
 Salem, AR 72576
PERSONNEL: John McCullough, President; Mary McCullough, Secretary/Treasurer; Brenda Smith, Sales Manager
DESCRIPTION: Market all McCullough Communications and McCullough Manufacturing, Inc. products. Includes single and dual conversion receivers, LNAs, feeds, antennas, mounts, controls, modulation cable and connectors.

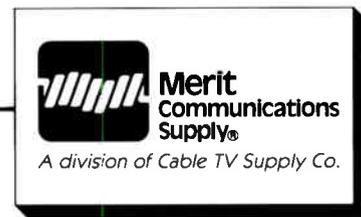
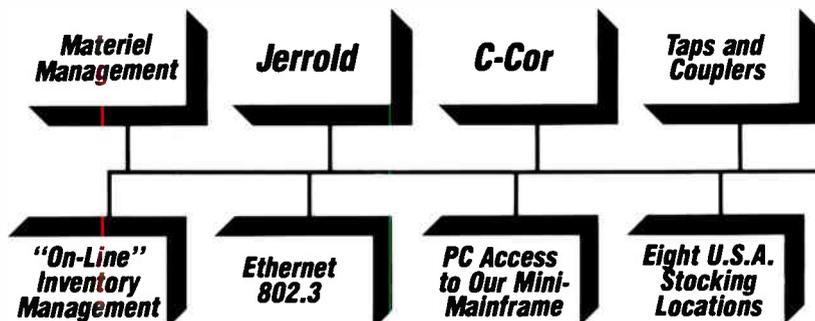
McGraw-Edison Power System. . . (412) 777-3200
 PO Box 2850
 Pittsburgh, PA 15230
PERSONNEL: L. Barwick, General Manager
REGIONAL OFFICES: Cooper Industries Inc., N. Burson St., E. Stroudsburg, PA 18031, (714) 421-8580.
DESCRIPTION: McGraw-Edison Power System/Cooper Industries Inc., is a manufacturer of line construction materials and pole line hardware.

McLaughlin Mfg. Co. (815) 436-9113
 WATS(National). (800) 435-9340
 PO Box 303
 Plainfield, IL 60544
PERSONNEL: Bill Gilman, President; Dave Gasmovic, National Sales Manager
REGIONAL OFFICES: Greenville, SC 29605, (803) 277-5870; Arlington, TX 76011, (817) 640-8605.
DESCRIPTION: Rotary drilling systems for utilities, cable, electric, etc....and horizontal boring machines, augers, cutting heads, pipe pushers, fiber optic installation equipment.



Mega Hertz Sales. (303) 779-1717
WATS(National). (800) 525-8386
 6940 S Holly Circle
 Ste. 200
 Englewood, CO 80112

Avoid Costly LAN Delays.



B R O A D
 B A S E
 F I B E R

YES! Send me info on: (Specify) _____

Name: _____ Mail to: Merit
 Title: _____ Communications Supply
 Company: _____ 5922 Bowcroft St.
 Address: _____ Los Angeles, CA 90016
 City, State, Zip: _____ **Or CALL 800-443-8615**
 Phone: () _____ **Nationwide.**

Melita Electronics

PERSONNEL: Steven Grossman, Sales/Marketing Manager; Pierre Cubbage, Regional Manager
REGIONAL OFFICES: 1211 Lackland Road, Ste. 383, St. Louis, MO 63146, (314) 878-6881, (800) 821-6800.

DESCRIPTION: Manufacturer's representative for: Broadband Engineering-replacement CATV components and electronics; Coil-PVC pedestals and brackets; Data Transmission Devices-standby power systems for CATV headends and cable lines; LRC Electronics-coaxial connectors for all CATV applications; MG Associates-digitized video, classified advertising channel; Multilink-cable mouldings, subscriber house boxes and coring tools; Panasonic-converters and subscriber switchers; Standard Communications-satellite receivers and antennas; Tamaqua-coaxial cable in conduit; Telecommunications Products-sequential and full random access commercial insertion products; Vitek Electronics-pay TV taps and RF detection devices; and Wavetek-test equipment. Distribution of: antennas-CATV log.

Melita Electronics. (602) 998-3600
 Labs, Inc.

PO Box 5120

Scottsdale, AZ 85261

PERSONNEL: Michael Domer, Pres./CEO

DESCRIPTION: Melita Electronics Labs, Inc. distributes robotic telecommunications computers for service call scheduling and verification, credit and collection notification, and marketing programs implementation. The Melita 3000 series telecommunicators place and receive telephone communication between customers and the cable service supplier. These automated communications are much more efficient than approaching these functions with your service personnel.

Metrotech Corp.. (415) 940-4900
 670 National Ave.

Mountain View, CA 94043

PERSONNEL: Norman MacLeod, President/Dir. of Engineering; Dan Housh, Chairman; Edward North, Vice President/Sales & Marketing Manager
DESCRIPTION: Designs, manufactures and sells underground locator equipment, including cable and fiber optic.

Mich-Com. (313) 753-3311
 Cable Services Inc.

21161 Otter Road

Belleville, MI 48111

PERSONNEL: Larry Bonadeo, President

DESCRIPTION: CATV wrecking and system maintenance.

Microdyne Corp.. (904) 687-4633
 491 Oak Road

PO Box 7213

Ocala, FL 32672

PERSONNEL: Louis Wolcott, CEO; Donald Feller, Vice President; Michael Balbes, Vice President; Hank Lin, Vice President; Eugene Day, Vice President

DESCRIPTION: Microdyne Corp., along with its subsidiary Antennas For Communications, produces a full line of satellite receivers, modulators, antennas and accessory products for the cable television industry. In addition, Microdyne also engineers and constructs fixed and transportable uplinks for both C-band and Ku-band transmissions.

Microflect Co., Inc.. (503) 363-9267
 3575 25th St. SE

PO Box 12985

Salem, OR 97309

PERSONNEL: John Krantz, Marketing Manager

DESCRIPTION: Designs, fabricates and installs microwave telecommunications antenna support structures, passive repeaters, and waveguide support systems. Microflect also designs, manufactures, and/or supplies helicopters concrete lift systems, manhole platform supports, tower accessories and tower hardware.

Microwave Filter Co. Inc.. (315) 437-3953
 WATS(National). (800) 448-1666
 6743 Kinne St.

E Syracuse, NY 13057

PERSONNEL: Glyn Bostick, President; Emily

Bostick, Exec. Vice President/Dir-Sales &

Marketing; Richard Jones, Vice President/

Finance; William Johnson, Vice President/

Engineering; Alice Berry, Vice President/

Personnel Development

DESCRIPTION: Microwave Filter Company supplies a wide variety of filters, traps and other passive components to combat interference in SMATV, cable TV, broadcast TV and general communications. Microwave Filter Company maintains a telephone group, which serves our 6,000 U.S. and 600 Canadian cable systems via field trips, publications and video tapes. Microwave Filter Company monthly handles 3,000 problems experienced by satellite distributors and dealers.

Midland Metals Corp.. (201) 939-1900
 301 Route 17N

Rutherford, NJ 07070

PERSONNEL: Sam de Vires, President; Jacques

de Vires, Vice President; Philippe de Vires, Vice

President; Joan Salvatore, Purchasing Agent

DESCRIPTION: Suppliers/distributors of: guy wire, on reels or in coils; overhead ground wire; aluminum conductor; copper wire and conductor; telecommunication cable and fiber optics.



MIDWEST CORPORATION
 CATV/SMATV. DIVISION

Midwest CATV (304) 343-8874
A Division of Midwest Corp.

WATS(National). (800) 532-2288

723 Kanawha Blvd. East

Charleston, WV 25301

PERSONNEL: Jerry Thompson, President; Chris

Sophinos, Vice President; Terry French, Vice

President; William Whiteley, Vice President

REGIONAL OFFICES: Northeast, RD#1, Box 48,

Delsea Drive, Sewell, NJ 08080, (800) 521-6243,

Bruce Furman, Sales Manager; Central, 405 N.

Earl Ave., Lafayette, IN 47904, (800) 428-7596,

Wendell Whitaker, Sales Manager; Eastern, 414

N. 5th St., Clarksburg, WV 26301, (800) 532-2288,

Jack Crouse, Sales Manager; Southern, 2697

International Parkway/Parkway 3, Ste. 128,

Virginia Beach, VA 23452, (800) 643-2288, Elijah

Midkiff, Sales Manager.

DESCRIPTION: Distributor of a complete line of cable TV equipment: antennas, headend electronics, distribution electronics and accessories, pole line hardware and strand, drop, trunk and feeder cable, converters, tools and most other cable TV accessories used by the cable operator including test equipment. Also sell LAN, SMATV and industrial market products.

Midwest CATV Engineering. . . (219) 259-8611
 1818 N Went St.

Mishawaka, IN 46545

PERSONNEL: Jim Wiseman, President; Andy

Wood, Sales Manager

DESCRIPTION: Repair facility for converters, home equipment, headend equipment, meters and TVROs.

MIDWEST CABLE SERVICES

Nationwide Buyers of all CATV Scrap Cable



Midwest Cable Services. . . . (219) 936-2545

310 N. Michigan St.

Plymouth, IN 46563

PERSONNEL: Ralph Howard, General Partner

DESCRIPTION: Nationwide buyers of scrap CATV cable and used line gear. Dispatched mobile units on-site pick up.

Midwest Comm.. (614) 452-7514
 Construction Co., Inc.

2405 Maysville Ave.

Zanesville, OH 43701

DESCRIPTION: Constructing aerial-underground cable. Constructing, maintaining and operating small cable systems.



MIDWEST

Communications Corp.

Midwest Comm. Corp.. . . . (606) 331-8990
WATS(National). (800) 543-1584

1 Sperti Dr.

Edgewood, KY 41017

PERSONNEL: Paul Nickless, CATV Sales Manager

REGIONAL OFFICES: 8875 NW 23rd St., Miami,

FL 33172, (305) 592-5355; 2730 Ayliff Road,

Norfolk, VA 23513 (804) 853-2600.

DESCRIPTION: Midwest Communications Corp.

is a complete supplier of CATV equipment including

satellite, TVRO receivers, LNA's and all associating

equipment; also line equipment, headend equipment

and hardware. Midwest Communications Corp. is

also the largest supplier of video equipment in the

United States, and manufacturer of mobile video

systems, production studios, individual components.

Monroe Electronics Inc.. (716) 765-2254
 100 Housel Ave.

Lydonville, NY 14098

PERSONNEL: E. Fuller, Sales Manager; R. Phillips,

Applications Engineer

REGIONAL OFFICES: 297 Evans Ave., Toronto,

Ontario M8Z 1K2 Canada.

DESCRIPTION: Manufactures time/tone/remote

switching equipment, commercial insertion

equipment, cue tone encoders and decoders,

emergency override systems, telephone couplers,

DTMF encoders and decoders, remote control and

status monitoring systems, audio/video switches.

Mucip Cable TV Services. (718) 712-3302
 115-62 Dunkirk St.

New York, NY 11412-3043

PERSONNEL: Paul Mucci, President; Robert

Cipolla, Vice President; Terence Mahon, Sales

Manager

DESCRIPTION: Established 1973. Contractor for

residential installation, trapping, audits, electronic

design, system construction of apartment buildings,

underground construction and splicing.



Engineered to make the Difference
Elyria, Ohio

Multilink (216) 324-4941

PO Box 955
Elyria, OH 44035
PERSONNEL: Steve Kaplan, Manager; George Hadaway, Engineer; Jeanie Holt, Office Manager
DESCRIPTION: Company products include: plastic enclosure box/security seals, olympic cable moulding, U-Guard Riser Guard, Guy Guard, Tree Guard, Drop Guard, coring tools, jacket strippers, Makita drills, dri-tap, 126-CR splice kits, underground drop splices, MDU apartment box and moulding mounting hardware, aerial trap weather boot housing, potting kits for underground installation.

Munn Jr., E Harold. (517) 278-7339
& Associates
100 Airport Road
Coldwater, MI 49036
PERSONNEL: E. Harold Munn Jr., President
DESCRIPTION: Broadcasting engineers and consultants.

Mycro-Tek. (316) 681-0550
9229 E 37th N
Wichita, KS 67226
PERSONNEL: Jacob Sorg, President; Al Aulbach, Vice President; Rich Calderola, Vice President; Richard Bailey, Vice President; Donna Hynes, Vice President
DESCRIPTION: The Single Channel Supra Star One and dual channel Supra Star Two provide 64K memory and up to nine fronts online. Both have system-to-system communication and genlock. Max is a stand alone character generator with 32K ram memory and a product life battery. Ernie, like Max, has a product life battery system and genlock capabilities.



NCS Industries Inc. (215) 657-4690
WATS(National). (800) 523-2342
WATS(State). (800) 492-2032

2255 E Wyandotte Road
Willow Grove, PA 19090
PERSONNEL: Dick Grasso, President; J. Bartholemew, Vice President/Purchasing; W. Sugarman, Vice President/Treasurer; Ted Mayo, Vice President/Engineering; Jerry Quinn, Sales Manager
DESCRIPTION: Product: repair service-headend, microwave, satellite receivers, test equipment, trunk and distribution all manufacturers.
Authorized warranty repair center for Wavetek, Alpha Technologies, Phasecom, Catel. Distributes Jerrold, Catel, Magnavox, Scientific-Atlanta, Olson Technology, Videotek, Metratch, CADCO, MSL. Mid-Atlantic representative for Wavetek, Alpha Technologies, Standard Communications.

NSC Electronics. (312) 956-8000
2201 Landmeier Road
Elk Grove Village, IL 60007
PERSONNEL: Dominick Palombella, President;

James Marx, Sales Rep.; Edward Warzyniak, General Manager, Mexico Plant; Chuck Sweigart, Sales Rep.; R.G. Shyu, Engineer
DESCRIPTION: Manufacturer and servicer of company cable converters and cable tuners for converters.

NaCom

Nacom Construction Corp. (614) 895-7307
WATS(National). (800) 848-3998

1900 E Dublin-Granville Road
Columbus, OH 43229
PERSONNEL: Bob Powelson, Chairman; Len Gibson, Vice Chairman; Larry Linhart, President & CEO; Jerry Evans, Vice President; Larry Brown, Vice President
REGIONAL OFFICES: Phoenix; Houston; Dallas; Washington DC; Los Angeles; St. Louis; Louisville; Minneapolis; Columbus.
DESCRIPTION: Full service system installation services for CATV, LAN, and other telecommunications industries; plant and drops, indoor and outdoor; construction and engineering/certification; aerial and underground coax, fiber, twisted pair; labor only or turnkey. LAN Division specializes in broadband and Ethernet LAN cabling systems design, installation and certification.

Nel Network. (416) 474-0206
Engineering Ltd.
180 Amber St.
Markham, Ontario
Canada, L3R 3J8
PERSONNEL: K. Odabashian, President; John MacMicking, Vice President; H.A. MacKinnon, Operations Manager
REGIONAL OFFICES: Ottawa Business Park, 2255 St. Laurent Blvd., Ste. 302, Ottawa, Ontario K1G 4K3.
DESCRIPTION: NEL is a Canadian firm providing professional consultancy and technical services to the cable television, telephone and power utility industries. Specific areas of expertise include franchise studies and evaluations, market studies, planning and engineering, rebuild methodology analysis, system survey and mapping, rebuild design, amplifier selection, long haul transmission analysis, microwave design, project management and administration.

Nelson Electric Supply Co. (214) 741-6341
1123 Slocum St.
Dallas, TX 75207
PERSONNEL: H. Campbell, President; Robert Nelson, Vice President
REGIONAL OFFICES: 2121 Baylor Dr., Lubbock, TX 79417, (806) 763-6006.
DESCRIPTION: Wholesaler for a complete line of pole line hardware, test equipment, passives, headend electronics, cable equipment, and various amplifiers and antennas.

Nemal Electronics Inc. (305) 893-3924
WATS(National). (800) 327-5999
12240 NE 14th Ave.
North Miami Beach, FL 33161
PERSONNEL: Benjamin Nemser, President
DESCRIPTION: Nemal Electronics Inc., is a major distributor of coaxial cable, connectors, and SMATV products. Our lines include Blonder-Tongue, Times, Amphenol, Kings, and our own private label mil spec brand. All popular items are in stock for immediate delivery worldwide.

New England. (617) 754-6537
Cable Contractors
219 Ludlow St.
PO Box 2474
Worcester, MA 01613
PERSONNEL: Larry Noon, President
DESCRIPTION: Cable aerial and underground construction and installations.



Nexus Engineering Corp. (604) 420-5322

7000 Lougheed Hwy.
Burnaby, BC Canada, V5A 4K4
PERSONNEL: Peter Van der Gracht, President; Dr. J.B. Peters, Chairman, CEO; Lyle Horne, Sales Manager
DESCRIPTION: Manufacturer of complete lines of commercial headend equipment including television modulators, heterodyne signal processors, on-channel processors, block converters, satellite receivers, stereo generators, stereo decoders, active combiners, audio modulators and completely racked and tested headends. Products for non-NTSC television standards are also available. Nexus Engineering also manufactures a complete line of television transmitters in the UHF and VHF range. These units range from 2 to 100 watt power levels and are also available in non-NTSC standard.

Norman Weinhouse Assoc. (818) 884-3105
6355 Topanga Canyon Blvd.
Suite 526
Woodland Hills, CA 91367
PERSONNEL: Norman Weinhouse, President
DESCRIPTION: Engineering consultant, microwave and satellite telecommunications.

Norsat International Inc. (604) 591-3334
WATS(National). (800) 422-8752
302-12886 78th Ave.
Surrey, British Columbia
Canada, V3W 8E7
PERSONNEL: Greg Peet, President; Wayne Meadows, Vice President/Network Products; Russ Tront, Production Engineer; Rick Nissan, Sales Manager/Canada; Harold Blackwell, Sales Manager/USA
REGIONAL OFFICES: 19105-36th Ave. West, Ste. 103, Lynwood, WA 98036, (206) 672-3211.
DESCRIPTION: Norsat International Inc. is engaged in the research, development, manufacture and distribution of satellite communications equipment for home systems, commercial applications, and private networks for the transmission of business data.

North Supply Company (913) 791-7000
600 Industrial Pkwy.
Industrial Airport, KS 66031
PERSONNEL: Stan Fisher, President; Andy Harris, Vice President
DESCRIPTION: A full line national distributor of telecommunications, security and alarm, cable television equipment and electrical utility products.

Northeast Cable. (203) 443-7675
Electronics Inc.
61 Myrock Ave.
Waterford, CT 06385
PERSONNEL: William Mickle, President; Albert Dimmock, Vice President; James Hapis, Secretary/Treasurer
DESCRIPTION: Repair of converters and line equipment.



Northeast Filter Co. Inc. (315) 437-7377
 14 Corporate Circle
 East Syracuse, NY 13057
PERSONNEL: Ruben Lugo, Executive Vice President
DESCRIPTION: CATV traps and filters.

Northern CATV Sales Inc. (315) 463-8433
 WATS(National). (800) 448-1655
 PO Box 6729
 Syracuse, NY 13211
PERSONNEL: Andy Tresness, President
DESCRIPTION: Distributor of CATV products.

OEM Sales. (818) 897-1120
 WATS(National). (800) 421-2379
 12500 Foothill Blvd.
 Lakeview Terrace, CA 91342
PERSONNEL: Michael Drzymkowski, Account Executive; Frank Bailey, Account Executive
DESCRIPTION: Receivers, amplifiers, connectors and installation materials for completely assembled headends or separate components; signal processors, stereo decoders, video distribution systems and CCTV equipment.



Oak Comm., Inc. (619) 451-1500
 16516 Via Esprillo
 San Diego, CA 92127
PERSONNEL: John Donohue, President; Carl Brown, Vice President/Sales & Marketing; Tony Wechselberger, Vice President/Engineering
REGIONAL OFFICES: 9624 Cincinnati Columbus Road, Suite 214, Cincinnati, OH 45241, (513) 777-5577; Jefferson Square Bldg., 621 Shrewsbury Ave., Shrewsbury, NJ 07701, (201) 747-8899.
DESCRIPTION: Converters, converter/decoders, addressable pay-TV systems, control software, satellite signal security systems.

Omega Satellite. (415) 427-1987
 Services Inc.
 3799 Chatworth St.
 Pittsburg, CA 94565
PERSONNEL: Dan DeVincent II, President; Kathy DeVincent, Vice President
DESCRIPTION: Installations in CATV, MATV, SMATV, prewiring-aerial-underground/postwire, audits, TVRO, C/KU Band downlink, MDS, VSAT, and teleconferencing downlinks; mobiles.

Orbitron - Division. (608) 588-2923
 of Greenbriar Products
 FAX (608) 588-2257
 351 S Peterson St.
 Spring Green, WI 53588
PERSONNEL: Frank Leach, President; James W. Garvoille, Vice President; Tor Caraway, Vice President/Marketing; David A. Johnson, National Sales
DESCRIPTION: Manufacturers of aluminum mesh antennas.

Overland Cable. (303) 337-0876
 2855 S. Ursula Court
 Aurora, CO 80014
PERSONNEL: Matt Mays, Co-Owner; Tom Randolph, Co-Owner
DESCRIPTION: Quality CATV construction specializing in aerial rebuilds and newbuilds.

Owens Tower Company (817) 968-3921
 PO Box 640
 Stephenville, TX 76401
DESCRIPTION: Provides fabrication, construction and engineering, consulting for antennas and towers.

P & B Enterprises. (215) 345-0134
 82 Pawnee Road
 New Britan, PA 18901
PERSONNEL: Pat Bartol, President/Chief Engineer
DESCRIPTION: Technical services and consultant, FCC proof of performance, H.E. alignment, co-channel surveys, system sweep, alignment, signal surveys, engineering surveys evaluations, system remedial and technical trouble shooting.

PK. Neuses, Inc. (312) 253-6555
 1401 Rohlwing Road
 PO Box 100
 Arlington Heights, IL 60006
DESCRIPTION: Supplier of cable tools, electronic tools, relay adjusting equipment, computer tools and supplies.

PECA, Inc. (215) 245-1550
 592 Winks Lane
 Bensalem, PA 19020
DESCRIPTION: Speciality communications and switching equipment and system design, installation of electronics and proof of performance broadband and baseband local area network equipment.

PICO MACOM. (818) 897-0028
 WATS(National). (800) 421-6511
 12500 Foothill Blvd.
 Lakeview Terrace, CA 91342
PERSONNEL: Michael Holland, President; Glenn O'Connell, Vice President/Sales & Marketing; John McClosky, Vice President/Operations
DESCRIPTION: Drop materials and amplifiers for CATV/MATV/SMATV. Modulators, switches, tools and installation material, transformers, jumper cables, splitters, headend components, signal processors, cable checkers, CCTV equipment and video distribution systems.

PTS/KATEK. (812) 824-9331
 WATS(National). (800) 441-2371
 5233 S Hwy. 37
 Bloomington, IN 47402
PERSONNEL: Gary Wilson, Cable Product Manager; Joe Achors, Cable Sales; John Gelfer, Cable Sales; Jeff Hamilton, Director of Marketing
REGIONAL OFFICES: 4941 Allison St., #11, Arvada, CO 80002, (303) 423-7080; 12341 Stark Road, Livonia, MI 48150, (313) 261-7410; 1919 Blanding Blvd., Jacksonville, FL 32238, (904) 389-9952; 110 Mopac Road, Longview, TX 74601, (214) 753-4334; 2476 Almeda Dr., Norfolk, VA 23513, (804) 853-5844; 6131 Watt Ave., North Highlands, CA 95660, (916) 334-2012; 8492 Brookville Road, Indianapolis, IN 46239, (317) 353-6668; 150 Venus St., #7, Jupiter, FL 33458, (305) 747-1808; 828 Mitchell Road, Newbury Park, CA 91320, (805) 499-8702; 701 Parkway View Dr., Pittsburg, PA 15205, (412) 787-3888; 300 Union St., Westfield, MA 01086, (413) 562-5205; 548 Penn St., Yeoman, PA 19050, (215) 622-0450.
DESCRIPTION: Converter sales and repair service with 13 nationwide locations. Buys and sells used converters. Jerrold Distributor.

Page OD - Professional (301) 469-6688
 Engineering & Consultants
 7536 Spring Lake Dr.

Bethesda, MD 20817
PERSONNEL: Od Page, Owner
DESCRIPTION: Engineering/management consultants and experts for CATV, MATV, SMATV, CCTV design, construction supervision and contract administration, appraisals, franchising, technical analysis and evaluation studies.

Panasonic Industrial Company

Panasonic Industrial Co. (201) 348-7000
 Audio-Video Systems Division
 One Panasonic Way
 Secaucus, NJ 07094
PERSONNEL: Steve Yuhas, Vice President/GM
DESCRIPTION: Supplies a full line of video equipment including; cartridge, cassette and open-reel in both player and recorder player versions and a wide range of cameras, monitors and accessories.

Panduit Corp. (312) 532-1800
 17301 Ridgeland Ave.
 Tinley Park, IL 60477
PERSONNEL: C. Miller, Nat'l Market Manager
REGIONAL OFFICES: Santa Ana, CA 92405, (714) 546-5700; Atlanta, GA 30328, (404) 256-5940; Leonia, NJ 07605, (201) 461-7790; Dallas, TX 75234, (214) 620-7717.
DESCRIPTION: Manufacturers of cable ties, mounting accessories and markers for the CATV industry.

Paraframe Comm., Inc. (403) 451-5532
 15618 116th Ave.
 Edmonton, ALTA, T5M 3S5
PERSONNEL: Walter Baydala, President
DESCRIPTION: Manufacturer of 4.8, 6.0 and 7.6 meter earth station antennas for 4 and 12 GHz service. Sizes to 12 meters available on special order. Installation service provided throughout North and South America.

Parallex. (919) 773-1327
 437 Goldfloss
 Winston-Salem, NC 27127
PERSONNEL: Dale Kline, President; Winton Wilcox, Vice President/Marketing; Bruce Odell, Vice President/Michigan; Kathy Pope, Asst. Vice President/Marketing
REGIONAL OFFICES: 6035 Executive Dr., Suite 2, Lansing, MI 48910, (517) 882-6063.
DESCRIPTION: Parallex provides automated subscriber billing, management and marketing information to cable systems. Services are available in batch, remote batch and on-line processing modes.

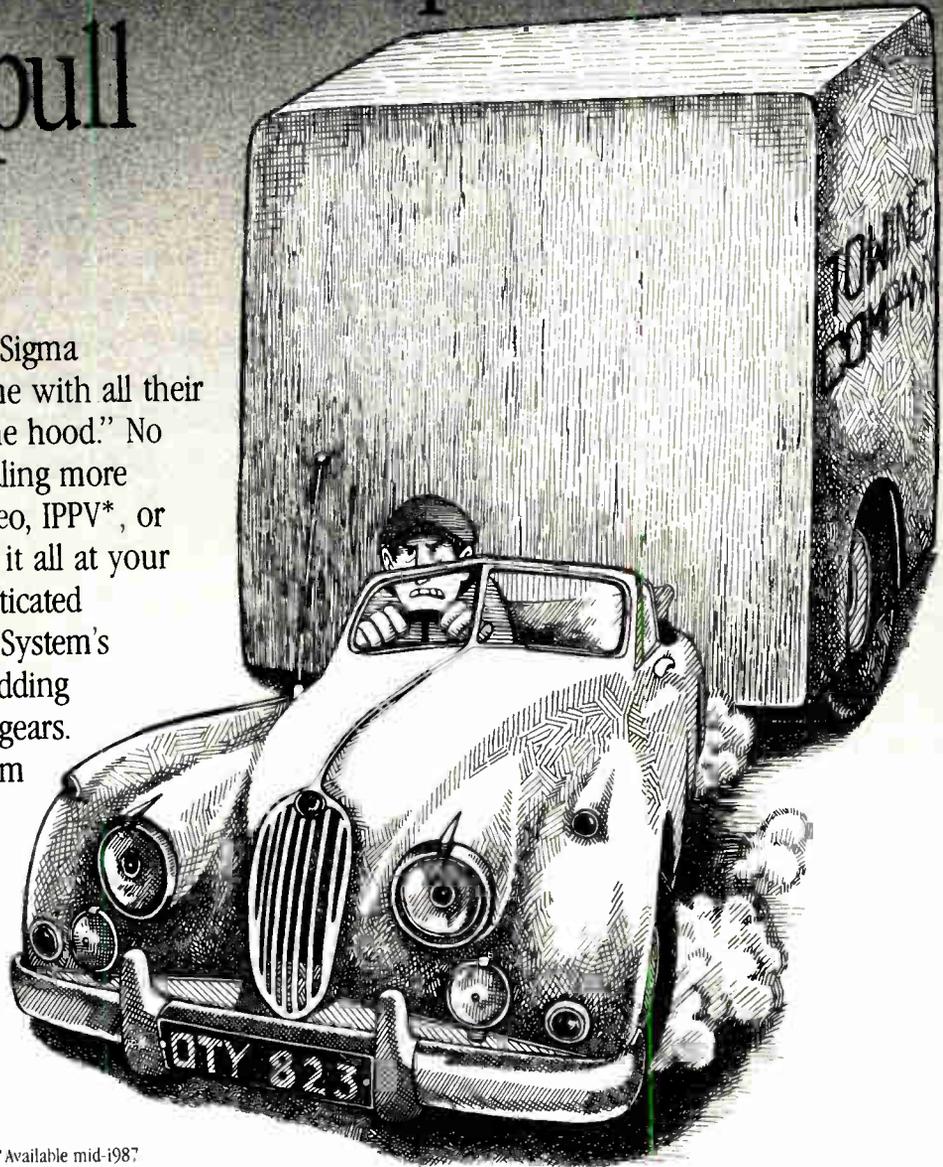
Parker Metal. (617) 791-7131
 PO Box 128
 Worcester, MA 01613
PERSONNEL: Peter Consiglio Jr., President; Jorgan Levy, Executive Vice President
DESCRIPTION: Manufacturers of fasteners, hardware and antenna installation hardware.

Passive Devices, Inc. (305) 493-5000
 5120 NE 12th Ave.
 Ft. Lauderdale, FL 33334
PERSONNEL: Donald Edelman, President; Barbara Edelman, Vice President/Finance; Leonard Gregory, Sales Manager; Joe Dolan, East Coast Rep.
REGIONAL OFFICES: Exclusive Distributors: Jerry Conn Assoc., T.R. Pitts Co., Mainline Equipment Co.

High performance sports cars shouldn't pull trailers.

OAK'S high performance Sigma Converter/Decoders come with all their features right "under the hood." No clumsy sidecars to make handling more difficult. Whether its MTS stereo, IPPV*, or VCR compatibility, Sigma puts it all at your fingertips in one sleek, sophisticated package. And with the Sigma System's host of addressable options, adding features is as easy as shifting gears. Powerful Oak-developed custom LSI technology ensures that you're in the driver's seat with more control, increased revenue, and all the power and security you need to cruise right into the next century. Why pull a trailer?

*Available mid-1987



- Available features to meet every need:
 - IPPV
 - All-channel MTS Stereo
 - Frequency mapping
 - Secure Master/Slave configuration
 - On-board VCR timer
 - Baseband outputs (audio, video, stereo)
- The most secure signal on the market

- 550-MHz tuner
- Full-function addressable remote control
- On screen message display
- Muting
- Last-channel and favorite-channel memories
- Electronic parental control
- Separate audio program
- Self-diagnostics

All of this comes with a sticker price a lot lower than you'd ever guess. Want more details? Call your nearest Oak sales representative or our division headquarters in San Diego (619) 451-1500.

OAK Communications Inc.

16516 Via Esprillo, Rancho Bernardo, CA 92127

Reader Service Number 34



DESCRIPTION: Manufacturers of high quality passive devices, surge voltage protectors such as the Suregenger™ patents pending, and suppliers of ancillary hardware items for CATV. As well, PDI buys and sells new and used CATV converters. The company also sells ISS Engineering modulators, demodulators and misc. satellite receiver equipment and accessories.

Pearl, J.C. Ltd. (716) 882-0500
50 Brayton St.
Buffalo, NY 14213
DESCRIPTION: Cable TV sub-contractor.

Pearce-Phelps Inc. (215) 879-7171
WATS(National). (800) 862-6800
2000 N. 59th St.
Philadelphia, PA 19131
PERSONNEL: W. Peirce, President; Henry Grove III, Vice President; R. Dyer, Vice President; Dennis Egan, Vice President; Fred Bergstrasser, Vice President
REGIONAL OFFICES: Rockville, MD 20852, (301) 984-7979; Camp Hill, PA (717) 761-0240.
DESCRIPTION: Provide video and audio equipment for commercial insertion and local origination; complete turnkey mobile vans and production studios.

Perception Technology (917) 821-0820
Shawmut Park
Canton, MA 02021-1409
PERSONNEL: Joseph Scally, President; Leon Ferber, Executive Vice President; Frank Tripi, Vice President/Sales; Daniel Matthews, Vice President/Operations; Paul Yecies, Vice President/Finance
DESCRIPTION: Perception Technology manufactures the BT-II, a data entry/voice response peripheral which transforms any telephone into a terminal. The BT-II can be used with any host computer running Pay-Per-View application software. A subscriber calls the pay-per-view number, enters his account number and an event code. Voice response verifies and gives confirmation. Prices start at \$33,500, for an 8 line system with 176 seconds of speech and also call referral.

Phoenix Cable/Lease. (404) 872-2406
100 Colony Square
Ste. 200
Atlanta, GA 30361
PERSONNEL: Ronald Demer, Sr. Vice President
REGIONAL OFFICES: 10 S. Franklin Turnpike, Ramsey, NJ 07446, (201) 825-9090, Jim Feeny, Vice President.
DESCRIPTION: Cable equipment leasing and financing; senior and subordinated debt for acquisitions and upgrades; serve franchised and private cable industries.

Pico Products Inc. (315) 451-7700
WATS(National). (800) 822-7420
103 Commerce Blvd.
Liverpool, NY 13088
PERSONNEL: Bernard Hitchcock, Chairman of Board/CEO; George Knapp, President; Danny O'Connell, Executive Vice President; Ralph Yahn, Chief Financial Officer; Jim Mead, Sales Manager
DESCRIPTION: Pico Products, Inc. manufactures and markets a complete line of system components for CATV, SMATV and MATV including security devices, modulators, single channel amplifiers, channel converters, wall taps, pre-amps, and complete headends for TV signal distribution in CATV, SMATV and STV.



Pioneer Communications. (201) 327-6400 of America Inc.

WATS(National). (800) 421-6450
600 E. Crescent Ave.
Upper Saddle River, NJ 07458
PERSONNEL: Pete Imamura, President; Jerry Landskron, Vice President/Administration; Yoshi Furukawa, Treasurer; Jerry Nelson, Director of Sales; Mike Hayashi, Marketing Manager
REGIONAL OFFICES: Sales Support & Engineering, 2200 Dividend Dr., Columbus, OH 43228, (614) 876-0771; Converter Repair and Service Center, 2182 Dividend Dr., Columbus, OH 43228, (614) 771-1050.
DESCRIPTION: Complete line of cable television converters including standard, tunable, and one-way addressable. Pulse add-on unit for impulse-pay-per-view technology. Also a SmartRemote™ which learns eight functions of a subscriber's entertainment equipment. Three headend configurations available for all size systems.

Pirelli Comm. Systems. (203) 238-9665
WATS(National). (800) 523-7893
300 Research Pkwy.
Meriden, CT 06450
PERSONNEL: John Iles, President; A. Deichmiller, Marketing Manager; Alan Kent, Sales Manager; David Friel, Marketing Support Manager
DESCRIPTION: Multi-channel, fiber optic supertrunks capable of 24 video signals, using single-mode, single-fiber, with better than 60 dB S/N.

Pitts, T.R. Co. (507) 452-2629
WATS(National). (800) 533-8092
WATS(State). (800) 642-2384
501 W Fifth St.
PO Box 57
Winona, MI 55987
PERSONNEL: T.R. Pitts, President; Don Thompson, N.W. District Manager
DESCRIPTION: CATV-SMATV materials and supplies, headends, cable, antennas, line and distribution materials and supplies amplifiers, origination, tools, test and drop equipment and supplies, commercial insertion equipment, marking flags and paint, corrosion inhibitors, and many regular and speciality items. Call us for the sales office nearest you.

PolyPhaser Corp. (702) 782-2511
WATS(National)(800) 325-71n70
1425 Industrial Way
Gardnerville, NV 89410-1237
PERSONNEL: Roger Block, President
DESCRIPTION: Over 40 models of patented lightning and nuclear EMP protection for DC to 2.5 GHz. Telephone line, tone remote and data line protection. Power mains, power line, power supply and DC protectors. Also manufacture DC voltage breakdown tester.

Pow-R Devices, Inc. (716) 741-2841
5940 Goodrich Road
Clarence Center, NY 14032
PERSONNEL: Lloyd Yoder, President/Sales Manager; Paul Yoder, Vice President
DESCRIPTION: Tool for installing pipe or cable under roadways to eliminate the need for open cutting the roadway.

Power & Telephone. (901) 324-6116
Supply Co. Inc.
WATS(National). (800) 238-7514
2668 Yale Ave.
Memphis, TN 38112
PERSONNEL: Jim Pentecost, Executive Vice President; Laburn Dye, Vice President/
Communications Division; Sonny Dickinson, Branch Manager (Main Contact); Dave Boykin, Director of Purchasing
REGIONAL OFFICES: 520 Interchange Dr. NW, Atlanta, GA 30336; Route 272, Reamstown, PA 17567; 2107 Old Greensboro Road N., Lexington, NC 27292; 4149 N. Clinton, Fort Wayne, IN 46085; 2701 Union Extended, Ste. 500, Memphis, TN 38112; 3101 SW 61st St., Des Moines, IA 50321; 3412 Ambrose, Nashville, TN 37207; 1055 W. Belt Dr. N., Ste. 110, Houston, TX 77043; Route 1, Hwy. 75 N., Huntsville, TX 77340; 2401 Brockton Dr. N., San Antonio, TX 78217; 5212 Marguerite Road, Knoxville, TN 37912.
DESCRIPTION: Full line distributor for cable, amplifiers, meters, taps, strand, hardware, drop material, headends, earth stations and all associated equipment.

Power Conversion. (815) 459-9100
Products Inc.
42 East St.
PO Box 380
Crystal Lake, IL 60014
PERSONNEL: S. Weil, President; C. Seyer, Executive Vice President; J. Mitchell, Vice President Engineering
REGIONAL OFFICES: Richardson, TX (214) 644-0108; Bill Krause, Western Regional Sales Manager, 4332 Morning Brook Ct., Stockton, CA 95207; Al Rotschild, North Central Regional Sales Manager, 2 East 8th St., #1713, Chicago, IL 60605.
DESCRIPTION: Battery charges, power supplies, complete DC power systems, battery eliminators, regulating/isolating transformers, DC to DC converters, ringing generators, and other power equipment for the telecommunications and cable industry.

Power Guard Inc. (404) 354-8129
PO Box 549
Hull, GA 30646
PERSONNEL: Mason Hamilton, Vice President; Jerry Schultz, President; Becky Porterfield, Customer Service Manager
DESCRIPTION: Manufacturers of standby and nonstandby power supplies and power grounding devices. Represent various standby battery manufacturers: Gould, Exide and Globe Union.



Power Technologies. (206) 882-2304
14860 NE 95th St.
Redmond, WA 98052
PERSONNEL: Werner Krajicek, President
REGIONAL OFFICES: 601 Fairway Dr., Deerfield Beach, FL 33442, (305) 429-0870, (800) 824-4332.
DESCRIPTION: Manufacturer of all types of power supplies.

Precise Mfg. Co. (602) 967-0030
WATS(National). (800) 821-0862
2143 E Fifth St.
Tempe, AZ 85281
PERSONNEL: Frank Conti, President; Harold Wedell, Vice President/Operations; Ferrell Anderson, Sales Manager

We don't follow anybody's footsteps. We make 'em.

One of the ways we are leading the industry is in the production of high-quality components at truly competitive costs. Another is in providing a truly one-step answer to all your CATV, MATV or SMATV problems, ranging from individual components to complete systems.

We will customize your headend system, problem by problem. And in one week, you'll have a complete, easy-to-set-up package, at unbeatable cost efficiencies and not just pre-assembled, but practically pre-installed.

Take advantage of our years of experience in Cable TV, Master Antenna and Private Cable headend applications. Call us for a quote on your particular headend needs, or, for our free 750-item catalog. Toll-free (800) 252-7889. In California, (800) 572-6262 or (818) 706-1940. Or write P.O. Box 6579, Westlake Village, CA 91359-6579.



QINTAR[®]
THE LEADING EDGE IN
COMMERCIAL HEADEND SYSTEMS.

Reader Service Number 35

Preformed Line

DESCRIPTION: Precise manufactures, in Tempe, Ariz., a line of high quality headend equipment for satellite, off air and video/audio inputs with outputs from sub channel through hyperband. The equipment is designed with an emphasis on reliability and performance in bad environments and is backed by a three year warranty.

Preformed Line (216) 461-5200
 Products Company
 PO Box 91129
 Cleveland, OH 44101
PERSONNEL: Jon Ruhlman, President; Max Lekson, Vice President; R. Skilton, Sales Manager
DESCRIPTION: Guy-grip headends, splices false headends, lashwrap connectors and plastic guy guards for guying and messenger strand construction. Telegrips, custom coaxial headends, teletaps and telescopes for coaxial cables. Headends for figure eight coaxial cables. Fusion splicers, closures and other products for fiberoptic systems.

Priester Supply (817) 261-1111
 Supply Inc.
 701 107th St.
 PO Box 5507
 Arlington, TX 76011
PERSONNEL: Steve Vincent, Sales; Oran Christian, Sales
DESCRIPTION: Supplier to the CATV industry. Product lines include Theta-Com, Comm/Scope, Gilbert, Catel, Joslyn, Chance, McGraw-Edison, Diamond, Preformed, Panduit, MSI and others.

Production Products. (800) 468-2288
 Company Assoc.
 133 W Seneca St.
 Manlius, NY 13104
PERSONNEL: John Mezzalingua, Chairman; Daniel Mezzalingua, President; Andrew Szegda, Vice President; Dominick Maio, Vice President
DESCRIPTION: A complete product line of aluminum connectors for trunk and distribution equipment as well as brass connectors and fittings for all cable television applications. We also carry a full line of low band, mid band, high band and super band traps.

Professional Line. (616) 924-6405
 Construction
 3250 Van Wagoner Ave.
 Fremont, MI 49412
PERSONNEL: Charles Lathrop, President
DESCRIPTION: CATV aerial construction.

Progressive Electronics Inc.. . . (602) 966-2931
 WATS(National). (800) 528-8224
 325 S El Dorado
 Mesa, AZ 85202
PERSONNEL: Richard Anderson, President; Scott Anderson, Sales Manager
DESCRIPTION: Tone generators, multipurpose. Installation and repair test sets. Inductive amplifier for electronic cable identification, cable fault locators.

Pyramid Cable Services Inc.. . . (305) 729-8803
 7805 Ellis Road
 W Melbourne, FL 32904
PERSONNEL: Joseph McCool, President; Robert Abbott, General Manager; Bob Black, Operations Manager; Skip Dawsey, Account Representative
REGIONAL OFFICES: 760 Warehouse Dr., Unit E, Toledo, OH 43615, (419) 382-5152, (800) 433-1129.
DESCRIPTION: Complete turnkey contractor, installations, pre-wiring, post-wiring, underground and aerial construction, splicing, headend set up, earth station and tower construction.

Pyramid Industries Inc.. (602) 269-6431
 WATS(National). (800) 528-4529
 PO Box 23169
 Phoenix, AZ 85063

PERSONNEL: Earl Gilbert, President; Steve Youtsey, Vice President; Charles Scurr, Vice President
DESCRIPTION: Manufactures a full line of CATV coaxial connectors, fittings and adaptors. Also manufactures a full line of metal pedestals for CATV and plant applications.

Q-Bit Corporation. (305) 727-1838
 2575 Pacific Ave. NE
 Palm Bay, FL 32905
PERSONNEL: Howard Hillman, Owner/President; Gary Callaway, Vice President/General Manager; Hansel Mead, Vice President/Engineer; Mary Rogers, Sales
DESCRIPTION: CATV headend equipment: Tower mounted low noise pre-amplifiers, (TO-8).



Qintar Inc.. (818) 706-1940
WATS(National). (800) 252-7889
WATS(State). (800) 572-6262
 PO Box 6579
 West Lake Village, CA 91359
PERSONNEL: Randall Tishkoff, President; John Russell, Dir. of Engineering; Michael Spratlin, National Sales Manager; Amy Hinman, Office Manager
DESCRIPTION: Manufactures RF switches, including 4 and 5 input 3 output switches. Custom labeling available. Also manufactures or distributes amplifiers, connectors, jumper cables, splitters, tapoffs, bandpass filters, transformers, converters, coaxial drop cable, and band separators. Also manufactures modular telephone accessories. 70 channel remote controlled set-top converter includes fine tuning and works with HRC, IRC, or standard channels. Custom designs available.

Quality Cable Underground. . . (303) 693-0457
 PO Box 4835
 Englewood, CO 80155
PERSONNEL: Daniel Levad, President
DESCRIPTION: Underground installation for cable TV, phone, joint and wrench. Street crossings, boring, post wire and prewire, splicing, construction.



Quality RF Services Inc.. . . . (305) 747-4998
WATS(National). (800) 327-9767
WATS(State). (800) 443-0107
 850 Parkway
 Jupiter, FL 33477
PERSONNEL: Fred Rogers, President; Ernest Catemlo, Vice President; Sylvia Rathbone, Sales Manager
DESCRIPTION: Module upgrades, new power doubling "P2" hybrid push-pull. Also "kits" equalizers, plug in pads. Repair service: amplifier repair with distortion documentation. Repair parts: tested repair component parts for all manufacturers. Same day shipment.

R & L Cable Installation. (419) 229-3400
 702 E Michigan Ave.
 Lima, OH 45801
PERSONNEL: Rodger Wauben, President; C. Lynn Wauben, Vice President
DESCRIPTION: Aerial and underground drop installations, systems service work, postwires and prewires, drop rebuilds and systems audits.

R. Alan Comm., Inc.. (317) 849-7572
 WATS(National). (800) 367-1450
 8120 Knue Road
 Ste. 106
 Indianapolis, IN 46250
PERSONNEL: Randy Pattison, New Market Development; Scott Widaman, Sales Manager; Tim Meschke, District Sales; Tina Sims, Office Manager
DESCRIPTION: Manufacturer's representative for CATV, business and industrial communications equipment.

RCH Cable Marketing. (609) 461-5640
 & Installation
 119 River Road
 Riverside, NJ 08075
PERSONNEL: Robert Halgas, President; James Arthis, Vice President; Robert DiBetta, Vice President
DESCRIPTION: Contract direct sales, systems audits, drop installations, post and pre-wiring, cable systems management.

RF Analysts Inc.. (313) 750-9341
 112 E Ellen St.
 Fenton, MI 48430
PERSONNEL: Jack Hooper, President; Dewayne Lip, Dir. of Engineering; Paul Bowsher, General Manager-MI; Jon Kilcoyne, General Manager-SC
REGIONAL OFFICES: 1255 Boston Ave., W.Columbia, SC 29169, (803) 794-3910; 2010 Pine Terrace, Sarasota, FL 33580, (813) 922-1551.
DESCRIPTION: R.F. Analysts does converter repair, satellite equipment repair, line equipment, headend gear, test equipment repair, and also manufactures a computerized test system for headends and for remote locations.

RF Distribution Systems. (209) 239-3332
 336 N. Main St.
 Manteca, CA 95336
PERSONNEL: J. Jenkins, President
DESCRIPTION: RF Distribution Systems offers complete engineering and design service for CATV and SMATV systems. From site surveys to complete installation and maintenance. In business since 1965.

RF Monolithics Inc.. (214) 233-2903
 4441 Sigma Road
 Dallas, TX 75244
PERSONNEL: Gary Andersen, President
DESCRIPTION: Converter output filter and traps.



RFI Comm., Inc.. (408) 298-5400
 360 Turtle Creek Ct.
 San Jose, CA 95125
PERSONNEL: Lawrence Reece, CEO; Dale Kirkland, COO; Dale McComb, Vice President
REGIONAL OFFICES: 6195 SW 112th St., Beaverton, OR 97005, (503) 626-6387; 3031 E. Coronado, Ste. G, Anaheim, CA 92806, (714) 666-2330; 20425 258th Ave. SE, Maple Valley, WA 98038, (206) 432-2455.

DESCRIPTION: RFI Enterprises and its subsidiaries, RFI Communications, RFI Electronics and RFI Security is a total systems integrator which provides engineering and consulting, materials supply and installation, customer service and systems maintenance for the following systems: CATV, MATV, CCTV, broadband LAN, Ethernet LAN, fiber optics, video, security, card access, fire alarm, fire suppression, life safety, audio, multimedia, telephone and various baseband computer systems.

RMS Electronics. (212) 892-1000
WATS(National). (800) 223-8312
50 Antin Place
Bronx, NY 10462

PERSONNEL: Ray Perez, Vice President/CATV Div.; Harry Bogatch, Vice President/Finance; Dominick Padilla, Vice President/Plant Operations
DESCRIPTION: Standby, inverter and AC regulated power supplies, power passing line splitters, directional couplers and directional taps; indoor-outdoor hybrid splitters and directional couplers; matching transformers and filters; attenuators; aluminum and "F" type connectors; apt. house boxes; pedestals, plastic and metal moulding duct, cable heat shrink tubing, traps, grease and sealant, indoor amplifiers, hardware, ground blocks & rods and tools.



RMT Engineering Inc.. (408) 733-4830
WATS(National). (800) 228-0633
625 E Taylor Ave.
Sunnyvale, CA 94086

PERSONNEL: Richard McLean, President; Patricia McLean, Vice President; Michael Kleykamp, National Sales Manager
REGIONAL OFFICES: Headend Repair: 1129 Koster St., Eureka, CA 95501, (707) 444-9437, Mike Gay, Manager/Engineer; Sales & Service: 7917 Selma Ave., #103, Los Angeles, CA 90046, (213) 654-4589, Rod Annis, Outside Operations Manager.
DESCRIPTION: Sales of new and remanufactured CATV products. Repairs of all CATV/SMATV electronics. Repairs of portable test equipment.

RT/Katek Communication. (201) 678-2083
Seven Glenwood Ave.
East Orange, NJ 07017

PERSONNEL: Robert Bilodeau, Company Chairman; Richard Thomas, Installation President; George Tamasi, Construction President; Ron Katz, Converter President; Tom Polis, Construction Executive Vice President
REGIONAL OFFICES: Seven Glenwood Ave., Installation Services Div., E Orange, NJ 07017, (201) 678-2083; 215 Wood Ave., Converter Services Div., Middlesex, NJ 08846, (201) 356-8940; 319 J Westtown Road, Comrn. Construction Div., West Chester, PA 19380, (215) 269-1946.

DESCRIPTION: Communications Construction Division: Full/modified/management/BOM turnkey construction; strand mapping, make ready survey, system design, engineering/franchise/as built/splicing services. Installation Services Division: Turnkey residential and commercial installations; audits rebuilds, converter changeouts and upgrades; MDU pre-and post-wire. Converter services Division: Factory authorized repair of Jerrold, Hamlin, RCA, Pioneer and and GTE/Texcan converters at regional repair centers in New Jersey, Florida, Indiana and California.

Radar Engineers. (503) 256-3417
9535 NE Colfax St.
Portland, OR 97220

PERSONNEL: James Groom, President; Robert Larson, Vice President/Sales Manager
DESCRIPTION: Test equipment for tracing cables and locating faults in underground cables.

Radyne Corp.. (516) 567-8484
170 Wilbur Place
Bohemia, NY 11716

PERSONNEL: Howard Hirschman, President; Alan Entenman, Vice President; Robert Petrucci, Executive Vice President; Corinne Camacho, Manager Sales and Marketing Support
DESCRIPTION: Radyne manufactures data modems for satellite, CATV, and terrestrial communications.

Rainbow Mfg. Corp.. (205) 591-4460
WATS(National). (800) 637-6047
PO Box 26445

Birmingham, AL 35226
PERSONNEL: Joe Steele, President/Sales Manager; Tom Morrison, Vice President; Doris Turner, Vice President
DESCRIPTION: Rainbow Mfg. Corp. provides specially packaged insecticides, herbicides and rodenticides, as well as marking paints for the CATV industry. We have the only solution to roaches, ants, spiders, wasps, hornets, bees and yellow jackets in converters and outside equipment.

Rainbow Satellite Communications

Rainbow Satellite Comm.. . . . (904) 326-8030

PO Box 395
Leesburg, FL 32748
PERSONNEL: Brian Wilkes, Vice President/Engineering
DESCRIPTION: Manufacture multibeam antennas.

Raychem CATV (415) 361-2288

Broadband
300 Constitution Drive
Menlo Park, CA 94025
PERSONNEL: Lynn Chapman, Manager/Sales & Marketing
DESCRIPTION: Manufactures TCS™ heat shrinkable tubing, EZF® drop connectors, GelTek™ strips for corrosion protection, SoftHeat™ antenna de-icing systems, and ThermoShield™ cable repair systems.

Reed Comm.. (215) 459-2982

PO Box 233
Chadds Ford, PA 19317
PERSONNEL: Jack Reed, President
DESCRIPTION: CATV system design. 23,000 miles of experience. Computerized bi-directional system design; computerized bill of material, rebuild analysis and design, design consultation, design critique, comparative equipment analysis.



Reliable Electric. (312) 455-8010
Utility Products
11333 Addison St.
Franklin Park, IL 60131

PERSONNEL: Bill Sedlacek, Vice President/General Manager; Ray Kubacki, Director of Sales & Marketing; Rick Siemens, Sales & Marketing Manager

REGIONAL OFFICES: 9 Jackson Ct. West, Marlton, NJ 08053, (609) 985-0165, Tim Ahrens, Area Sales Manager; 4118 E. Kasselyrne Ct., Tucker, GA 30084, (404) 496-0653, Doug Frassrand, Area Sales Manager; 2235 River Run Drive, #3304, San Diego, CA 92108, (619) 584-4617, Pete Torres, Area Sales Manager; 640-B Schubert Ave., Chicago, IL 60614, (312) 528-4774, Frank Priebe, Area Sales Manager.

DESCRIPTION: Reliable Electric/Utility Products manufactures heavy-gauge, mill galvanized steel enclosures and apartment boxes. All enclosures are treated to a nine-stage finishing process for superior resistance to the environment. Also available are warning labels, decals, mounting hardware and a variety of locks.

Remtek Corp.. (415) 490-3999

46107 Landing Pkwy.
Fremont, CA 94538
PERSONNEL: Bruce Michels, President; Ralph Gesell, Executive Vice President; Thomas French, Vice President
REGIONAL OFFICES: PO Box 6906, Marietta, GA 30066, (404) 977-1630.
DESCRIPTION: Remtek's Medium Wall Cable Sleeves (MWS), a quick shrinking, medium wall polyolefin tubing with large expansion ratio, provides good electrical insulation and at the same time resists abrasion and corrosion. In addition, Remtek supplies a variety of heat shrinkable tubing for cable harnessing, jacketing applications, and wire/cable markers.

Resource Recovery Systems. . . . (512) 633-0630

11373 Southton Rd.
San Antonio, TX 78223
PERSONNEL: Tom Wood, Sr., Marketing Manager; Tom Wood, Jr., Accounts Manager
REGIONAL OFFICES: 14127 Langbourne, Houston, TX 77077, (713) 439-5158.
DESCRIPTION: Nationwide purchasers of scrap system coax cable and electronics.

Ripley Co. Inc.. (203) 635-2200

46 Nooks Hill Road
Cromwell, CT 06416
PERSONNEL: H. Thayer, President; J. Matthews, Vice President; R. Clark, Sales Manager
DESCRIPTION: A complete line of cable preparation tools including coax cable strippers, jacket strippers, coring tools, combination core/strip tools, hex crimp tools, conductor cleaners and accessories.

Ripley Co. Inc. Utility Tool Div.. (203) 635-2200

46 Nooks Hill Road
Cromwell, CT 06416
PERSONNEL: Robert Clark, Marketing Manager; Pat Kracunas, Customer Service; Karol Paduch, Customer Service
DESCRIPTION: Manufactures a complete line of coaxial cable preparation tools.

Riser-Bond Instruments. (402) 694-5201

505 16th St.
Box 188
Aurora, NE 68818
PERSONNEL: Marshall Borchert, President; Jennie Borchert, Vice President; W. Campbell, Sales Manager
DESCRIPTION: Manufacturer of electronic test equipment.

Rohde & Schwarz. (516) 328-1100

Polarad, Inc.
5 Delaware Dr.
Lake Success, NY 11042
PERSONNEL: J. Shimony, Treasurer; W. Wend, Plant Manager; W. Thompson, Director Engineering

DESCRIPTION: Manufacturers of spectrum analyzers, auto-bus controlled transceiver test sets, modulation analyzers, synthesizers.

Rohn (309) 697-4400
PO Box 2000
Peoria, IL 61656

PERSONNEL: R. Kleine, Vice President/Sales & Marketing; Kenneth Cordrey, Div. Sales Manager; Larry Grimes, Div. Sales Manager; Fred Hardee, Div. Sales Manager; Philip Metcalfe, Div. Sales Manager

REGIONAL OFFICES: PO Box 106, Worton, MD 21678, (301) 778-4441; 2631 Tarna St., Dallas, TX 75229, (214) 241-7791; PO Box 609, Frankport, IN 46041; PO Box 170249, Birmingham, AL 35217-0249; Warehouses; PO Box 155, Bridgeport, NJ 08014; 2631 Tarna St., Dallas, TX 75229; 310 Quincy St., Reno, NV 89512.

DESCRIPTION: Manufacturer of towers for broadcast, microwave mobile radio; equipment shelters; tower obstruction; lighting; safety devices and tower accessories.

Roll-A-Reel Co. (513) 761-8500
7881 Reading Road
PO Box 37381

Cincinnati, OH 45222

PERSONNEL: Leonard Shifres, President/Sales Manager; Dolores Shifres, Vice President
DESCRIPTION: Manufacturer and distributor of cable reel platforms for pay out, and take up of materials packaged on reels (ie; wire, cable, hose).

Ross Comm. Inc. (215) 776-7330
1633 N. 26th St.

PO Box 413 (Zip 18105)

Allentown, PA 18104

PERSONNEL: William Ross, President

DESCRIPTION: Provide aerial and underground construction services, MDU, splicing and engineering.

Rosstek Comm. Ltd. (604) 291-7130
4343 E Hastings St.

Burnaby, BC, V5C 2J7

PERSONNEL: Lyman Lai, President/Sales Manager

DESCRIPTION: Products: DBC, Triple Crown, Sadelco, Catel, RCA, Magnavox, DX Antenna, Nexus Engineering. Reconditioned trunk and bridger amps, line amps, apartment amps. Service: All makes of CATV products, TV modulator processors, demodulators, FM processors, trunk amps, apartment amps. Change modulator, processor and demodulator to different channels, field strength meters. Personal computer compatible to IBM PC/XT/AT.

Rycom Instruments Inc. (816) 353-2100
WATS(National). (800) 851-7347

9351 E 59th St.

Raytown, MO 64133

PERSONNEL: E. Reitz, President; Tom Wood, Sales Engineer; Jack Rice, Operations Manager
DESCRIPTION: Manufacturers of buried cable fault and pipe locators.

S.B.M. Communications. (616) 345-0109
517 E Kalamazoo Ave.

Kalamazoo, MI 49007

PERSONNEL: Earl Drake, President; Tom Ridley, Vice President

DESCRIPTION: S.B.M. provides system audits, radiation checks, fans, system sweeps, activations and proofs.

SDI Services Inc. (305) 791-3451
2521 NW 6th St.

Fort Lauderdale, FL 33311

DESCRIPTION: Full service cable TV company. Feasibility studies, site survey, engineering, design, strand mapping, make ready, headend and system construction, aerial and underground construction,

post- and pre-wiring, system management and maintenance.



SIG Enterprises Inc. (915) 595-6740

1410 Gail Borden

Ste. A5

El Paso, TX 79935

PERSONNEL: Donald Priem, President; David Shurts, Vice President

DESCRIPTION: Converter and transmission equipment service for most major brands including Pathmaker and Theta-Com. Some Pathmaker refurb equipment available.

SJC Cable Splicers Inc. (517) 821-5900
9142 W Higgins Lake Dr.

Roscommon, MI 48653

PERSONNEL: Steve Collini, President

DESCRIPTION: Experienced with all types of cable, connectors, and equipment associated with modern cable systems; dual or single with institutional; aerial or underground. "We do one job and do it best." Experienced with "hot" upgrades or rebuilds of CATV plant.

SRP Electronics, Inc. (404) 963-7870
WATS(National). (800) 241-1232

641 Grayson Hwy.

Lawrenceville, GA 30245

PERSONNEL: Joe Acker; John Weeks

DESCRIPTION: Economical character generators with graphics capabilities for CATV, SMATV applications.

Sabre Comm. Corp. (712) 258-6690
PO Box 536

Sioux City, IA 51102

PERSONNEL: D. Bailey Aalfs, President; Jerry Audus, Sales Manager

DESCRIPTION: Manufacture antenna systems, HF, UHF/VHF, tower systems both guyed and self supporting, pre-assembled equipment shelters.



Sachs Communications Inc.,

Sachs Comm. Inc. (514) 636-6560
WATS(National). (800) 361-3685

30 W Service Road

Champlain, NY 12919-9703

PERSONNEL: I. Sachs, President; Peter Hineson, Technical Manager; Sam Wells, Technical Manager; Alison Bright, Inside Sales

DESCRIPTION: Sachs is a manufacturer of quality telecommunications hardware for the CATV and telephone industries, specializing in innovative and cost-efficient suspension, fastening UL Listed Grounding devices for aerial construction and subscriber drop-line installations. Sachs hardware is quality hardware designed to be long-lasting, labor-saving and security-oriented. The product line includes: cable support straps, lashing wire clamps, span clamps, strand tap brackets, drop clamps for messengered or non-messengered coaxial cable, UL approved grounding blocks and straps, fastening clips and hooks, metal "saxxon" cable clips, aluminum write-on ID tags and flags.

Sadelco, Inc.

Sadelco, Inc. (201) 569-3323

75 W Forest Ave.

Englewood, NJ 07631

PERSONNEL: H. Sadel, President; G. Goldman, Vice President/Sales Manager

DESCRIPTION: Manufactures a full range of signal level meters from 4.5 to 900 MHz, including a white noise generator and a bridge.

Satcom Technologies Inc. (404) 448-2116
2912 Pacific Dr.

Norcross, GA 30071

PERSONNEL: Marvin Shomake, President; David Speed, Vice President Marketing/Sales; James Oliver, Vice President/Engineering; Doug Henderson, Broadcast Marketing Manager

DESCRIPTION: Manufacture and sale of earth station antennas. Five meter through 11 meter diameters and 2.4 KU-SNG antennas.

Satellite Cable Specialists. . . . (802) 773-4006
PO Box 1807

Station A

Rutland, VT 05701

DESCRIPTION: CATV construction company serving the CATV industry since 1979. Specializing in overhead construction, rebuilds and newbuilds. Pre-wiring, installations, audits, mapping and design.

Satellite Systems. (301) 652-4660
Engineering Inc.

7315 Wisconsin Ave.

Fifth Floor East

Bethesda, MD 20814

PERSONNEL: W. Pritchard, Chairman of the Board; Robert Napp, Vice President/Radio Systems; Phil Schneider, President; Rennie Stamminger, Executive Vice President; Bob French, Vice President/Eng. & Economic Studies

DESCRIPTION: Consulting services for satellite systems FM and cellular mobile radio engineering, economics, finance and planning. Publishes technical reports regularly, including a quarterly update service, Satellite Systems Digest, which offers technical and non-technical data on all communications satellites in the world.

Scala Electronic Corp. (503) 779-6500
PO Box 4580

Medford, OR 97501

PERSONNEL: Ellis Feinstein, Vice President/General Manager; Dan Fowler, Marketing Manager

DESCRIPTION: For more than 30 years Scala antennas have earned a reputation for high performance and long-term reliability in CATV systems in every type of environment ranging from arctic to tropical marine. Careful electrical and mechanical design, conservative specifications and consistent quality control assure you of maximum value for your antenna dollar.

Schenck Construction. (206) 827-4884
5525 Lakeview Dr.

PO Box 3029

Kirkland, WA 98083

PERSONNEL: Edward Schenck, President; Oliver Longnecker, Vice President; Imel Wheat, Vice President

DESCRIPTION: Aerial and underground cable TV construction; turnkey.

Scientific Atlanta

Scientific-Atlanta Inc. (404) 441-4000
 One Technology Pkwy.
 Atlanta, GA 30348
PERSONNEL: Sidney Topol, Chairman of the Board; John Levergood, Chief Operating Officer; William Johnson, Vice Chairman/CEO; James Hart, Group Vice President; Larry Bradner, Div. Vice President/Broadband Comm.
REGIONAL OFFICES: 4025 Pleasantdale Road, Atlanta, GA 30340, (404) 449-2530; 814 W Emmett St., PO Box 2143, Kissimmee, FL 32741, (305) 846-0055; 936 S 59th St., Belleville, IL 62223, (618) 233-7203; 901 International Pkwy., Ste. 141, Richardson, TX 75081, (214) 238-1116.
DESCRIPTION: Complete line of cable TV products including earth stations and receivers, low noise converter, headend electronics, distribution products, taps and passives, coaxial cable, set-top terminals, and status monitoring system.



Scientific-Atlanta Inc. (416) 299-6888
Digital Video Systems Div.
 120 Middlefield Road
 Scarborough, ONT, M1S 4M6
DESCRIPTION: Manufacturers of time-base connectors, TBC/frame stores, frame synchronizers, and test generators.

Seaman-Parsons Corp. (414) 251-2400
 W161 N9116 Hayes Ave.
 PO Box 630
 Menomonee Falls, WI 53051-0630
PERSONNEL: Charles Read, President; Scott Anfinson, Sales Administrator; Curtis Schmidler, Product Manager
DESCRIPTION: Manufacture trenchers and cable plows. Import and sell compaction equipment.

Search Associates. (813) 261-0917
 PO Box 783
 Naples, FL 33939
PERSONNEL: Brad Estes, President
DESCRIPTION: Executive search and placement firm specializing in management, professional and technical positions in cable television. A division of the Naples Group.

SENCORE

Sencore (605) 339-0100
WATS(National) (800) 843-3338
 3200 Sencore Dr.
 Sioux Falls, SD 57107
PERSONNEL: Doug Bowden, Vice President; Tom

Archer, Sales Manager; Garrett Carter, Sales Manager; Rob Barden, Merchandising Manager
DESCRIPTION: Sencore designs, manufactures and markets a full line of field strength meters, video analyzers, oscilloscopes, and other innovative electronic test equipment.

Siecor Corporation. (704) 327-5000
 489 Siecor Park
 Hickory, NC 28603-0489
PERSONNEL: Allen Dawson, Chief Executive Officer; Joseph Hicks, Sr. Vice President/Sales & Marketing; Salim Bhatia, Vice President/Marketing
DESCRIPTION: Optical cable and ancillary equipment for telephone, CATV, CCTV, computer process control, military, government, and data communications applications.

Siemens Components Inc. (201) 321-3400
 186 Wood Ave. S
 Iselin, NJ 08830
PERSONNEL: Helmut Schwab, President; Klaus Bahr, Sr. Vice President & General Manager
DESCRIPTION: Manufactures power surge protectors for CATV, saw filters, and microwave semiconductors.

Sigmacom. (416) 666-1991
 111 Industrial Dr. Unit#5
 Whitby, Ontario
 Canada, L1N 5Z9
PERSONNEL: Randy Zedic, President; Mike Taylor, Vice President; Al Smelko, Sales Manager
DESCRIPTION: Cable MA-CATV-SMATV, design, engineering, special audio up- and downlinking, data carrier systems.

Sigmaform Corp. (408) 727-6510
 2401 Walsh Ave.
 Santa Clara, CA 95051
PERSONNEL: W. Weagant, Pres./Chairman of the Board; W. Neiman, Vice President; Mike Mathis, Telecom Div. Manager
DESCRIPTION: Provide heat shrinkable tubing, heat shrinkable molded shapes and repair sleeves.

Signal Processing. (214) 341-6595
WATS(National). (800) 527-4361
WATS(State). (800) 442-3574
 11630 Chairman Dr.
 Dallas, TX 75243
PERSONNEL: Dave Koncak, President; Jim Austin, Vice President/Engineering; Hank Bawcum, Vice President/Manufacturing; Carl Fors, Vice President/Marketing
DESCRIPTION: Headend electronics manufacturing including receivers, modulators, processors, combiners.



Signal Vision Inc. (714) 586-3196
 3 Wrigley
 Irvine, CA 92718
PERSONNEL: Neil Phillips, President; Mike Thatcher, Marketing Manager
DESCRIPTION: West coast distributor of underground construction products, passives, aerial drop hardware, connectors, fittings, security boxes, shrink tubing, apartment house amplifiers, molding, pedestals and flush to ground vaults, tools and installation materials

Siltron Illumination Inc. (714) 980-4484
 7915 Center Ave.
 Cucamonga, CA 91730
PERSONNEL: Albert Lange, President; Carlos Ruiz, Vice President/Operations; Ray Gardner, Vice President/Engineering; Patti Brand, Sales Manager
DESCRIPTION: Manufacturer of standby power supplies and uninterruptable power supplies for the cable industry.

Simplicity Tool Co. (503) 253-2000
Sitco Antennas
 PO Box 20456
 10330 NE Marx St.
 Portland, OR 97220
PERSONNEL: Gustave Berliner, President; Steven Berliner, Vice President; Markus Bureker, Engineer
DESCRIPTION: Manufacturers of MATV, CATV, SMATV, translator antennas and antenna arrays. Custom antennas built to order.

Simplicity Tool Co. (503) 253-2000
Sitco Antennas
 PO Box 20456
 10330 NE Marx St.
 Portland, OR 97220
PERSONNEL: G. Berliner, President; Lee Pellet, Engineer; Marcus Bureker, Engineer
DESCRIPTION: CATV, UHF and VHF antennas.

Sir Enterprises. (804) 845-8722
WATS(National). (800) 759-4242
 2459 Campbell Ave.
 Lynchburg, VA 24501
PERSONNEL: Elbert Yeatts, President; Gary Irvy, Chief Engineer
DESCRIPTION: Full service CATV construction specializing in aerial and underground construction, system activations, upgrades, rebuilds, maintenance, design, etc.

Sola. (312) 439-2800
 A Unit of General Signal
 1717 Busse Road
 Elk Grove, IL 60007
PERSONNEL: John Hutson, President; James Kimball, Vice President/Sales Marketing; Fred Lemke, Director of Sales & Mktg.
DESCRIPTION: Sola is a major supplier of power conditioning, power supply and battery back-up equipment to all areas utilizing sensitive electronics or critical applications.

Sony Corp. of America. (201) 930-1000
 Sony Dr.
 Park Ridge, NJ 07656
PERSONNEL: Neil Vander Dussen, President/Chief Oper. Officer; Jason Farrow, Vice President
DESCRIPTION: Consumer and industrial electronics products.

Southeast Cable. (904) 879-1311
Construction Corp.
 PO Box 177
 Callahan, FL 32011
PERSONNEL: Joann Brong, President; Anthony Brong, General Manager
DESCRIPTION: Construction for cable TV companies.

Southland Underground. (800) 228-2151
CATV Inc.
 #28 Industrial Loop
 Ste. 176
 Orange Park, FL 32073
PERSONNEL: Richard Barnett, President; Roger Barnett, Vice President; Jon Eckert, Manager/Titusville; Donnie Damico, Manager/Clearwater; Martin Wakula, Manager/Turnersville, NJ
REGIONAL OFFICES: 12570 66th St., N Largo, FL 33540, (813) 576-0204; 2313 Mountain Road, Pasadena, MD 21122, (301) 437-9101, Joseph Hamil, Manager; #28 Industrial Loop, Orange Park, FL 32073, (904) 264-1003.

Southwire Company

DESCRIPTION: Provide all phases of CATV construction strand mapping, design, turn on etc., for both underground and aerial; unit prices as well as turnkey.

Southwire Company (404) 832-4242
PO Box 1000
Carrollton, GA 30119

PERSONNEL: Roy Richards, President/Operations; James Richards, President/Admin. & Finance; D.B. Cofer, Executive Vice President
DESCRIPTION: Manufactures electrical wire and cable in aluminum or copper; copper and aluminum rod, continuous cast coils.

Sparks Equipment Co. (209) 245-6946
PO Box 413
Plymouth, CA 95669

PERSONNEL: Don Sparks, Owner
DESCRIPTION: Complete coverage of power generating equipment inverters, dynamotors, portable generators, standby generators, prime power generators, battery operated standby (5 ms transfer) UPS (uninterruptable power supply).

Spectrum Planning Inc. (214) 680-1000
WATS(National). (800) 527-4607
251 W. Renner Road
Richardson, TX 75080

PERSONNEL: Jerry Armes, President; Duncan McIntosh, Co-Chairman; Lyman Bishop, Vice President/Sales & Marketing
REGIONAL OFFICES: 1111 19th St. NW, Ste. 1000, Washington D.C. 20036, (202) 429-9122; 2nd Floor, 2/3 Cornwall Terrace, Regents Park, London NW1-4QP, England, Tele:1486-8812.

DESCRIPTION: Comprehensive telecommunications management and engineering services including the design, engineering and implementation of satellite, microwave, mobile and fiber optic communications networks. 1) Frequency coordination of satellite earth stations, 2) Terrestrial microwave frequency planning, 3) Radio frequency, interface (RFI) measurements, 4) Frequency protection, 5) VHF translator filing, 6) Path surveys, 7) Route/path design, 8) Software development.

Sprucer CATV Group. (201) 271-7544
400 Cottontail Lane
Somerset, NJ 08873

PERSONNEL: Y. Tanaka, President; Y. Ohara, Vice President; K. Ogiso, Group Manager; K. Akabane, Administration; N. DeCostanza, Manager/Sales & Marketing
DESCRIPTION: Sprucer Two-Way interactive addressable cable system consists of: Baseband converter modulators, encoders, FSK/PSK modems, system computers, bridge gate controllers (BGC), printers, uninterrupted power supply, system operation and application software. Billing interface. Warranty and maintenance provided.



Standard Comm. Corp. (213) 532-5300
WATS(National). (800) 243-1357
PO Box 92151
Los Angeles, CA 90009

PERSONNEL: Donald Thomas, President; Mark Thomas, Vice President; Mason Truluck, Marketing Manager; Dianne Hinte, National Sales Manager
DESCRIPTION: A complete line of antennas, low noise amplifier/block downconverters and receivers in both C- and Ku-band is offered. The product line features: commercial grade components, flexible

operation utilizing 4GHz of LNBC input, block downconversion, active loop thru design, temperature stabilized dielectric resonator oscillator, and the industry's strongest warranty and five year replacement program.

Standard Truck. (404) 622-4461
& Equipment Co.

WATS(National). (800) 241-9357
1155 Hill St. SE
Atlanta, GA 30315
PERSONNEL: Jack Taffel, President; Harvey Taffel, Partner/Sales Manager; Fran Quinn, Sales Manager
DESCRIPTION: Large selection of aerial bucket trucks geared for CATV/crane trucks/derrick diggers.

Stark & Associates. (404) 962-4800
490 Buford Dr.
Lawrenceville, GA 30245

PERSONNEL: James Stark, President; Jack Walker, Vice President
DESCRIPTION: Engineering consulting to SMATV and CATV; industrial manufacturer rep for major lines. Feature nationwide construction capacity.

Starvision Sales. (403) 255-2345
D-10 6115 3rd St. SE

Calgary, Alberta
Canada, T2H 2L2
PERSONNEL: W.W. Armstrong, President; D.J. Graham, Vice President; J.R. Doucette, Sales Manager
DESCRIPTION: Distributor of satellite television receiving equipment, cable television equipment and complete broadcast systems.

Stelco Inc. (913) 287-1500
5500 Kansas Ave.

Kansas City, KS 66106
PERSONNEL: Wayne Stallard, President; George Eckels, Vice President
DESCRIPTION: Manufacturers of aerial devices, material handling, cable placing and equipment associated therewith.

Step Electronics Inc. (408) 379-5720
1190 Dell Ave.

Campbell, CA 95008
PERSONNEL: Steve Bartolomeo, Vice President
DESCRIPTION: Step Electronics offers a software package, DPA-1000, for calculating intermodulation products in CATV distribution systems. It enables system engineers to identify the source frequencies causing spurious products in any channel. DPA-1000 runs on IBM XT and AT computers. The program can handle several hundred input carriers and store more than 10,000 spurious products for analysis.

Stern Telecommunications Corp. . (212) 725-5470
307 Fifth Ave.

New York, NY 10016
PERSONNEL: Joseph Stern, President
DESCRIPTION: An engineering, consulting and development organization providing innovative and cost-effective application engineering in broadcasting, satellite transmission, cable television, data transmission, telephony and electronics. Services offered include operational studies, equipment evaluation, product planning, system design and development and venture analysis.

Strata Communications. (507) 452-2629
Industries Inc.

501 W Fifth St.
Winona, MN 55987
PERSONNEL: T. Pitts, President
DESCRIPTION: Manufactures commercial insertion equipment that automatically inserts local commercials on satellite channels that permit local ADV's! ROS-upgradeable, simple operation, low cost.

Stubblefield Company Inc. (214) 534-1411
1914 Deerbrook Dr.

Tyler, TX 75703
PERSONNEL: Charles Stubblefield, President; Scott Stubblefield, Dir. Nat'l. Field Operations
DESCRIPTION: Cable auditing and marketing.

Summit Cable. (817) 277-6995
1162 W. Pioneer Pkwy.

Arlington, TX 76013
PERSONNEL: David Bahrenburg, Vice President
DESCRIPTION: Provides cable installation for aerial, underground, residential.

Superior Cablevision Installers Inc. (201) 992-1792
PO Box 128

Livingston, NJ 07039
PERSONNEL: Phillip Collins Sr., President; Jerry Rufft, Director of Operations; Cheryl Collins, Controller
DESCRIPTION: Superior provides drop installations, multiple dwelling overwires, trapping, service changes, drop changeovers (old to new plant), sales and marketing through its various contract installers. With regard to drop installations, both aerial and underground are completed either with or without a turnkey approach.

Superior Metal Products Inc. . . . (206) 455-9159
2120-116th Ave. NE

Bellevue, WA 98005
PERSONNEL: Joseph Bookter, President; Ray Bookter, Vice President; Fred Larsen, Sales Manager
DESCRIPTION: Takes great pride in offering a complete line of high quality custom constructed enclosures, special requirements of the CATV industry. Manufactures three major product categories; Wall mounted enclosures, pedestal mounted above-ground enclosures, flush-to-ground encapsulating vault enclosures.

Supra Key Control Ltd. (613) 523-1280
WATS(National). (800) 267-6317

Box 8963
Ottawa, Ontario, K1G 3J2
PERSONNEL: Iral Barrett, President; Preston Davis, Operations Manager
DESCRIPTION: Supplying a complete line of Key Control products to the CATV industry for over 30 years. Supra's lock boxes, locking wallplates and cabinet/pedestal locks allow your servicemen and technicians immediate access to locked customer's locations with our one Title Key. The only entry system you need.

Synchronous Comm. Inc. (408) 943-0222
1885 Lundy Ave.

Ste. 102
San Jose, CA 95131
PERSONNEL: Vincent Borelli, President; Al Johnson, Dir. of Marketing; Herman Gysel, Dir. of Engineering
DESCRIPTION: Manufacturer of frequency agile headend components. Also of broadcast quality multi-channel fiber optic video links.

System Services Cable. (805) 688-7720
Construction Inc.

3681 Sagunto Road
PO Box 755
Santa Ynez, CA 93460
PERSONNEL: R. Scott, President; Valerie Scott, Vice President; Jeff Williamson, Engineering
DESCRIPTION: Specializing in a full line of services. Overhead, underground, installation, prewiring, postwiring, and general maintenance. Engineering services, walk-out and design, auditing and management consulting.

Sytek Inc. (415) 966-7400
1225 Charleston Road

Mountain View, CA 94039
REGIONAL OFFICES: Meadows Office Complex

1, 301 Route 17 North, 8th Floor, Rutherford, NJ 07070, (201) 935-6400; 6500 Rock Spring Dr., Ste. 100, Bethesda, MD 20817. (301) 530-5100; Hamilton Lakes, 1 Pierce Pl., Ste. 360 W, Itasca, IL 60143, (312) 250 0057; 2010 N. First St., Ste. 401, San Jose, CA 95131, (408) 436-3400; 250 Consumers Road, Ste. 1007, Willowdale, ONT M2J 4V6, (416) 494-8200.

DESCRIPTION: Sytek is a data communications company that provides engineering consulting services and local area network product line, LocalNet™ for data communications applications.

TL Systems. (619) 320-8006
762 Vella Road
Palm Springs, CA 92264

PERSONNEL: Ted Lafleur, President
DESCRIPTION: Headend equipment consisting of satellite receivers, TV modulators. UHF/VHF processors; Model 7682-BLK block converted satellite receivers; Model 7682-LPM satellite receiver with built-in TV modulators; Model 7610-LPM low cost TV modulators; Model 7610-UHF/VHF UHF to VHF or VHF to VHF processors. Model 7620-VHF or UHF audio video demodulators.

GENERAL INSTRUMENT

TOCOM/General Instrument. . . (214) 438-7691
PO Box 569240

Dallas, TX 75356-9240
PERSONNEL: Jack Hammer, Vice President/Operations; Sid Prothro, National Sales Manager; Tom Martin, Dir. of Research & Development
REGIONAL OFFICES: 767 Fifth Ave., 45th Floor, New York, NY 10153, (212) 207-6300; 2611 Westgrove Road, Carrollton, TX 75006, (214) 248-7931; 7100 E Bellevue Ave., Ste. 101, Englewood, CO 80111, (303) 740-6118.

DESCRIPTION: Manufacturer of a complete line of advanced communications systems for the CATV industry. Products include the TOCOM Plus line of baseband addressable set-top converters, decoders and headend control systems and home security products including home alarm terminals and alarm only terminals.

TPC Connectors. (203) 274-3628
PO Box 4537

Waterbury, CT 06704
PERSONNEL: Guy Grey Jr., President/Sales Manager
DESCRIPTION: Manufactures and supplies F series connectors to the CATV industry. Production quantity discounts available, special components manufactured upon request. Phone or write us with your specifications.

TVC Supply Company Inc. (717) 533-4982
WATS(National). (800) 233-2147
WATS(State). (800) 482-2398

1746 E Chocolate Ave.
Hershey, PA 17033
PERSONNEL: Robert Ackerman, President; Jim Manari, Manager/Major Accounts
DESCRIPTION: Full line distributor. Microdyne earth stations, Texscan pathmaker distribution, Belden drop cable, Joslyn hardware, Antronix passives, Gilbert connectors, Klein Tools, Pioneer converters, Times Fiber cable, Lemco tools.

TVM Systems Inc. (817) 268-6061
PO Box 1526

Hurst, TX 76053
PERSONNEL: William Millett, President
DESCRIPTION: Consulting management and

services group to CATV - system management, analysis, auditing, CATV installation and construction.

Tamaqua Cable Products Corp. . . (717) 385-4381
PO Box 347

Schuylkill Haven, PA 17972
PERSONNEL: William Combs III, President; John Dutton, Sr. Vice President; Andrew Pavlick, Vice President/Finance; Michael Homa, Vice President/Manufacturing; George Combs, Vice President/Sales & Marketing
REGIONAL OFFICES: R.H. Babcock, PO Box 660, Roswell, GA 30077, (404) 998-9587; M.W. Spencer, 1378 Pearl Road, Ste. 103, Brunswick, OH 44212, (216) 225-3052; C.H. Gaynor, 248 Greenhigh Ave., Goshen, NY 10924, (914) 294-6339.

DESCRIPTION: Coaxial or fiberoptic cable (from the manufacturer of your choice) pre-installed in flexible, high density polyethylene duct in continuous lengths up to 6.3 kilometers (19,200').

Tapecoat Co. (312) 866-8500
PO Box 631

Evanston, IL 60204
PERSONNEL: J. O'Brien, President; G. Harris, Vice President/Technical Svcs.; A. Maki, Sales Manager
DESCRIPTION: Moldable sealant and tapes for above and below ground applications to protect cable splices, conduit and other irregular surfaces from corrosion.

Taylor Telecommunications Inc. . (216) 784-2960
2040 E Market
Akron, OH 44312

PERSONNEL: Rich Taylor, President; Tam Taylor, Vice President
DESCRIPTION: Cable installation contractor; underground construction, apartment pre-wiring, residential installation.

Technetronics Inc. (914) 561-7880
192 Route 9W

New Windsor, NY 12550
PERSONNEL: Andrew Healey, President; Donald Davidson Jr., Vice President
DESCRIPTION: Full service communications construction engineering company. Specializing in rebuilds, upgrades and turnkeys. All services available EFL.

Teco Inc. (219) 747-1631
PO Box 9247

9733 Indianapolis Road
Fort Wayne, IN 46809
PERSONNEL: Bruce Dammeyer, President; Dave Wick, Sales Manager; Steve Heiniger, Sales Manager
REGIONAL OFFICES: 118 Little Valley Court, Birmingham, AL 35244, (205) 987-7534.
DESCRIPTION: Aerial lifts (buckets), aerial lifts (complete trucks), 40 models available with over-center, non over-center and telescopic booms. Also heavy-duty material lifting capabilities and tree trimming features. Heights from 28 feet to 85 feet.

Tektronix Inc. (503) 627-1844
PO Box 500

Delivery Station 58-699
Beaverton, OR 97077
PERSONNEL: Dave Friedley, Group Vice President; Larry Kaplan, Television Div. General Manager; Steve Kerman, Director of Sales
DESCRIPTION: Tektronix manufactures a wide range of test, measurement and monitoring equipment used within the television industry. These include waveform monitors, stereo audio equipment, synchronizers, automatic measurement equipment, vector scopes, picture monitors, generators, radio frequency products, analyzers and correctors, digital converters, and general purpose products. Additional products from communications division includes spectrum

analyzers, cable testers, fiber optic cable testers, (FOTDR) and data communication analyzers.



Tele-Engineering. (617) 877-6494
WATS(National). (800) 832-8353
Two Central St.

Framingham, MA 01701
PERSONNEL: Earnest Tunmann, President; Gary Cooper, Product Manager
REGIONAL OFFICES: Product Div. 12 Humbert St., N Providence, RI 02911, (401) 232-5444; Sales & Exec. Offices 2 Central St., Framingham, MA 01701, (617) 877-6494.

DESCRIPTION: AD CUE random access commercial insertion systems with positive verification plus advertising control software enable operators to obtain local advertising revenues economically on 2 to 12 channels. PVS (programmable video switching) systems provide a full week of hands-free programming—from single channel substitution to complex matrix switching—for up to 10,000 events. Full service turnkey coaxial and fiber optic cable and microwave engineering includes system design, makeready, strand mapping, bill of materials, project management, construction, activation and proof of performance testing.

Tele-Spectrum Inc. (617) 322-2400
214 Commercial St.

Malden, MA 02181
PERSONNEL: Edward MacMullin, President; Harold Landwehr, Jr., Vice President
DESCRIPTION: CATV consulting to municipal and state agencies, and educational facilities. In addition, voice and data consulting, RFP preparation and completion.

TeleCom Systems Inc. (704) 332-6064
PO Box 5214

Charlotte, NC 28225
PERSONNEL: Charles Hicks, President
DESCRIPTION: Full service communication construction and engineering company. Provide turnkey construction services for major communication projects world wide. Distribution of headend equipment.



TELECOMMUNICATION PRODUCTS CORPORATION

Telecommunication Products. . . (717) 267-3939
115 Spring Valley Road

Chambersburg, PA 17201
PERSONNEL: Thomas Carbaugh, President; Sonya Williamson, Marketing Administrator; Don Rice, Chief Engineer
DESCRIPTION: Manufacturer of ad sales automation system. Products include Nexus I, Administrator, Channel Controller, Basus, Basus + V.

Telecorp Systems Inc. (404) 449-6991
WATS(National). (800) 334-9907

5825-A Peachtree Corners E
Norcross, GA 30092

Telecrafter Products Corp.

PERSONNEL: Dana Webster, Vice President
DESCRIPTION: Telecorp Systems, Inc. is an integrated designer, manufacturer and reseller of telecomputing devices. Our product lines consist of single and multiple line telephone autodialers, voice response units and automated telephone attendants and voice messaging systems. Cable companies use the System 606 autodialer to notify subscribers of accounts past due, commencement of their service, notification of additional services available, and completion of service calls. They also use the System 6000 voice response units to provide 24 hour service to allow subscribers to authorize pay-per-view, inquire about account balance and request service. Internal applications include converter check-in, converter swap, service call resolution and tracking of work orders. Cable companies use the Perfect Receptionist as a cost effective solution to their telephone traffic problems. This system relieves their staff from the routine tasks of routing and screening all incoming calls and will take messages for those people who are not available or forward their calls to an alternate extension.

Telecrafter Products Corp. (406) 245-8200
 WATS(National). (800) 548-7243
 PO Box 21475

Billings, MT 59104-1475
PERSONNEL: Dorit Herman, President
DESCRIPTION: Manufacturer and supplier of drop security and installation products. Cable markers: including single digit address identification, serialized subscriber control, service identification, customized system and audit tags. Enclosures and locking and security devices: the audit control box, drop control box, residential control box, Tele-Theft Control Locking System, and converter security seals. Drop fastening tool: The RB-2 Clip Gun and RB-2 Cable Clips (in .3' regular style and .4' long style nail available in black, beige and white).

Teledac Inc. (514) 671-7762
 661 Pine St.

St. Lambert, Quebec
 Canada, J4P 2P4
PERSONNEL: Martin Chouinard, President
DESCRIPTION: Manufacturer of character generators. Model T-1300 for multi-user applications and T-1016 series for low cost standalone message display. On screen premium channel guide with our Promoguide and Promocycle systems. We specialize in cable-ads and TV listings.

Telemet Div. of Geotel Inc. (516) 842-2300
 185 Dixon Ave.

Amityville, NY 11701
PERSONNEL: S. Hamer, Pres./General Manager; R. Griffiths, Vice President Sales; L. Lazarus, Nat'l. Sales Manager
REGIONAL OFFICES: Rfd #3, Brewster, NY 10509, (914) 279-3231.

DESCRIPTION: Provides sideband analyzer, group delay measuring equipment, modulators, demodulators, video distribution amplifiers, video test signal generators, routing, switches, video cable terminals, repeaters, clamping amplifiers, differential phase and gain, measuring equipment, fiber optics.

Teletronics-O.L. Inc. (518) 875-6444
 PO Box 278

Rte. 20
 Esperance, NY 12066
PERSONNEL: Gary Rudolph, President; Peggy Rudolph, Vice President; Rudolph Moentmann, Sales Manager; Tom Johnson, Sales Representative
DESCRIPTION: Converter repair company for eastern U.S. Repairing Jerrold, OAK, Hamlin and Regency converters. All makes of line equipment are also repaired.

Television Cable. (904) 736-7161
 Communications.

2666 Gracie Dr.
 Deland, FL 32724

PERSONNEL: Edward Whitney, President
DESCRIPTION: Thirty years in CATV. Charter member of Cable TV Pioneers 1966. Executive Director, National Cable Television Assn., 1957-1961; National Sales Manager, Ameco, Inc. Phoenix, AZ 1961-1964; Vice President/Sales, Entron Inc. Silver Springs, MD 1964-1966; President, Entron Inc. Silver Springs, MD 1966-1970; President, Television Cable Communications 1971-to date.

Telpar Inc. (214) 233-6631
 PO Box 796

Addison, TX 75001
PERSONNEL: William Konrad, President; Mark Sherman, Vice President Marketing
DESCRIPTION: Manufactures character generator text generators. Character text generator with up to 64 pages of memory. On board battery back-up is standard and weather system is available as an option. Suitable for remote operation through modems. Key design feature is user friendliness!!

Tempo Enterprises Inc. (918) 496-3200
 PO Box 702160

Tulsa, OK 74170
DESCRIPTION: Tempo Enterprises Inc. is a diversified satellite communications company involved in the distribution of Superstation WTBS, (through a separate subsidiary), Tempo Sound, Tempo Data, Tempo Television (see separate listings for details). The company also owns 21 cable systems, an independent UHF station in Ann Arbor, MI, and holds a 50% ownership in another UHF station in Tulsa, OK. Tempo also owns an AM radio station, a video production company, and holds interests in other communications ventures.

Tempo Text. (404) 949-6600
 3530 Bomar Road

Douglasville, GA 30135
PERSONNEL: Fred Williams, Data Manager
DESCRIPTION: Tempo Text offers various teletext services. One example is Electra, a national teletext magazine featuring national and international news, sports, sports, business and weather reports. Another is Stock Pulse, an alphabetical listing of more than 500 stocks. Quotes are updated on a 15 minute delay basis throughout the day.

Temtron Electronics Ltd. (516) 599-6400
 WATS(National). (800) 645-2300

15 Main St.
 East Rockaway, NY 11518
PERSONNEL: Sid Sussman, President; Glen Haimes, National Sales Manager
DESCRIPTION: Distributor of CATV replacement parts and equipment, microwave tubes, TWT's, Klystrons, camera tubes, surge arrestors, capacitors, transistors of all types, integrated circuits, RF hybrids all types, and drop and line supplies. Also available: Jerrold equipment, plug in pads, stage and studio lamps, and all types of commercial lighting.

Terado Corp. (612) 646-2868
 1068 Raymond Ave.

St. Paul, MN 55108
PERSONNEL: D. Munson, President; R. Munson, Vice President; Fred Munson, Sales Manager; Fred Albright, Production Manager
DESCRIPTION: Standby emergency electric power inverters - uninterruptable electric power.

Terra Link Corporation. (512) 282-8430
 11600 Manchaca, Ste. 112

PO Box 783
 Manchaca, TX 78652
PERSONNEL: Stephen Brown, President; William Matthews, Vice President

DESCRIPTION: Complete CATV and SMATV services. Capabilities include mapping, design, construction, LANs, maintenance, installations, MDUs and performance testing. Engineering and consulting services are available. As well as turnkey operations.

Test Systems/ESP Inc. (602) 894-9891
 1045 W. Geneva Drive

Phoenix, AZ 85282
DESCRIPTION: Test Systems/ESP manufactures a complete line of automatic interconnection circuit testers, access fixtures that perform open-short, high voltage leakage test, continuity test and resistance measurement on wired products where circuit wiring forms the foundation of interconnect. Product access and test applications include but are not limited to bare and loaded P.C. boards, multilayers and thin layers; wired back planes, cable and harness assemblies, ceramic substrates for close center probing, etc.

Texscan

OUR TIME HAS COME

Texscan Corp. (915) 594-3555
 10841 Pellicano Dr.

El Paso, TX 79936
PERSONNEL: Dr. William Firestone, Vice President/General Manager; Ray Pastie, Vice President/Sales & Marketing; William Dawson, Vice President Engineering; Norm Barnard, Vice President Manufacturing
DESCRIPTION: Founded in 1965, manufacturer of CATV distribution equipment, power supplies, commercial insertion equipment, character generators, test equipment, RF components, status monitoring, and MMDS reception systems.

Texscan Instrument Div. (317) 545-4196
 WATS(National). (800) 344-2412

3169 N Shadeland Ave.
 Indianapolis, IN 46226
PERSONNEL: Gary Gerhold, Vice President/GM; John Shaw, Sales Manager
DESCRIPTION: Manufactures CATV test equipment, satellite test equipment, components, filters, automated test systems and status monitoring.

Texscan

MSI CORPORATION

Texscan MSI/Compuid. (801) 359-0077
 WATS(National). (800) 367-6011

124 Charles Lindbergh Dr.
 Salt Lake City, UT 84116
PERSONNEL: David Keller, Div. General Manager; Ken Lawson, Dir. of Marketing
DESCRIPTION: This division of Texscan Corp. manufactures automated program origination systems including generators, graphics displays, commercial insertion and VCR program playback.

The Headend. (614) 766-0874
 2690 Sawbury Blvd.

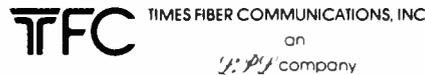
Worthington, OH 43085-1821
PERSONNEL: Steve Shaefer, President; Denise Shaefer, Vice President; Tim Holzer, Sales Manager

DESCRIPTION: A full line product supplier to the CATV, SMATV, LAN markets. Has Cablebench repair facility. Represents Lindsay, Belden, Triple Crown, Pico/Macom, Jerrold, others.



Time Manufacturing Co.(817) 776-0900
7601 Imperial Dr.
Waco, TX 76710

PERSONNEL: Charles Turner, President; John Harrison, Sales Manager; Lee Taylor, Sales Manager
DESCRIPTION: Manufacturers of Versalift aerial lifts, telescopic and elbow types, truck or van-mounted, with working heights up to 55 feet. Sold internationally, through distributors.



Times Fiber Comm. Inc.(203) 265-8500
An IPL Company
358 Hall Ave.

Wallingford, CT 06492
PERSONNEL: Jack Forde, President; Rex Porter, Vice President Cable Prod. Div.
DESCRIPTION: Manufacturers of coaxial cables, trunk and feeder cable, drop cable for CATV.



Toner Cable Equipment Co. . . .(215) 675-2053
WATS(National).(800) 523-5947
WATS(State).(800) 492-2512

969 Horsham Road
Horsham, PA 19044
PERSONNEL: Robert Toner, President/Sales Manager
DESCRIPTION: National distributor of CATV headend electronics, distribution and installation equipment and computer management/billing systems.

Toshiba America Inc.(312) 564-1200
2900 Mac Arthur Blvd.
Northbrook, IL 60062
PERSONNEL: Mr. Hiyama, President; Mr. Oghino, Sr. Vice President; Mr. Kiriya, Marketing Manager; Mr. Takato, Engineering Manager
DESCRIPTION: CATV converter, up/down tuner, modulator, digital audio system, home security system, satellite receiver.

Trans Sales International.(303) 694-1960
3600 S Yosemite St.
Ste. 300
Denver, CO 80237
PERSONNEL: Roland Yount, President
DESCRIPTION: Provides headend and earth station

pre-assembled buildings. Also provides battery hydrogen gas detector.

Trans USA Corp.(201) 254-3020
WATS(National).(800) 526-3656
PO Box 548
7 G Joanna Court
E Brunswick, NJ 08816
PERSONNEL: Li Liaw, President; Stephen Kovacs, Sales Manager
DESCRIPTION: Trans USA Corp. manufactures/imports distribution amplifiers, taps, splitters, matching transformers, filters, connectors, stereo decoders and converters. Accessories for video/audio, MATV/CATV. Products are imported from Tiawan. Serving the industry since 1975.



TRILITHIC

Trilithic, Inc.(317) 823-4719

6840 Winona Drive
Indianapolis, IN 46236-9506
PERSONNEL: Bruce Malcom, President
DESCRIPTION: Trilithic, Inc. designs and manufactures RF components and digitally controlled RF sub-systems. Components include very cost effective and high performance programmable A/B switches, complex switches, and attenuators. Digitally controlled sub-systems include RS-232 and telephone tone controlled multiple switch banks, matrix switches, and attenuators. Frequency range is DC to 1450 MHz. Serving the cable and LAN instrumentation and systems industries, specific products include: latching programmable attenuators to 1000 MHz; programmable power passing 650 MHz switches; automatic loss-of-signal A/B switches; and RS-232, 16 Addressable Card, 1000 MHz switch bank.



Trilogy Communications.(601) 932-4461

WATS(National).(800) 874-5649
2910 Hwy. 80 E
Pearl, MS 39208
PERSONNEL: Steven Hallock, President; John Kaye, Vice President/Engineering & Manufacturing; Shinn Lee, Executive Vice President; Bill Kloss, National Sales Manager
DESCRIPTION: Manufacturer of 75 and 50 ohm MC2 coaxial cables along with UL approved plenum cables.



Triple Crown Electronics Inc. . . .(416) 629-1111

WATS(National).(800) 824-4332
4560 Fieldgate Dr.
Mississauga, Ontario, L4W 3W6

PERSONNEL: Charles Evans, President; P. Ayiotis, Vice President; A. Kleopa, Vice President; K. Poirier, Vice President; B. Ward, Director of Marketing
REGIONAL OFFICES: 601 Fairway Dr., Deerfiled Beach, FL 33442, (305) 429-0870.
DESCRIPTION: Triple Crown Electronics manufactures BTSC stereo generators, satellite receivers for 4 and 12 GHz, TV and FM modulators, processors and demodulators, indoor and line amplifiers (300 & 450 MHz), DBC addressable products and Cable Power Inc. standby power supplies.

Triplett Corporation.(419) 358-5015
WATS(National).(800) TRI-PLETT
One Triplett Dr.

Bluffton, OH 45817
PERSONNEL: Warren Hess, President; Kenneth Dahlstrom, Vice President; Don Klaus, Product Manager; Hubert Hauser, Product Manager
DESCRIPTION: Manufacturer of electronic/electrical test and panel instrumentation.

Trompeter Electronics Inc.(818) 707-2020
31186 La Baya Dr.
PO Box 5069

Westlake Village, CA 91359-5069
PERSONNEL: E. Trompeter, President; Paul Cox, Sales Administrator; Jim Roling, Plant Manager; Hap Gladish, National Marketing Manager; Ross Gaines, Purchasing
REGIONAL OFFICES: Over 30 manufacturer's representatives across the United States and Canada. Contact our main office for the location nearest you.
DESCRIPTION: Manufactures over 35 families of RF and patching connectors for coaxial, twinaxial and triaxial applications, as well as cable assemblies.

Tru-Level Inc.(602) 924-1083
925 N Stapley

Ste. C
Mesa, AZ 85203
PERSONNEL: Steven Holtman, President
DESCRIPTION: Tru-Level Inc. is a well diversified company that handles all jobs from engineering to installation of cable, and installation of customer to audit system.

Tulsat Corp.(918) 836-8348
WATS(National).(800) 331-5997
1839 N 105th E Ave.

Tulsa, OK 74116
DESCRIPTION: Distributor for automation techniques and service center. For SMATV, modifications to make receivers compatible with descramblers.

Turner Cable Construction Co. . .(314) 729-3119
PO Box 576
Salem, MO 65560

PERSONNEL: Butch Turner, President; Jane Turner, Vice President
DESCRIPTION: Provide outside plant construction and aerial buried splicing drops.

U S Television Systems Inc. . . .(512) 454-5779
WATS(National).(800) 252-9742
914 Banyon St.

Austin, TX 78757
PERSONNEL: T. Burger Jr., President; Howard Kay, Vice President
DESCRIPTION: Provide system design, system alignment, proof of performance, FCC compliance testing, amplifier repair, construction, aerial and underground.

U.S. Cable Inc.(414) 733-3321
2911 N Ballard Road
Appleton, WI 54913

PERSONNEL: Glenn Mullen, President; Jerry Wood, Vice President; Robert Frazier, Secretary
REGIONAL OFFICES: 421 Terra Lane West,

O'Fallon, MO 63366, (314) 272-2020.
 DESCRIPTION: Utility contractors for cable TV, telephone and LAN networks.

UEC SKYVAN(405) 528-3479
 PO Box 54979

Oklahoma City, OK 73154
 DESCRIPTION: Manufacturer of Skyjacker and Skyvan articulating and telescoping aerial baskets, in several models, and 3 power sources: Electric/hydraulic, PTO/FanBelt Pump, or dual power with both. Mounts on pickups, vans or cab and chassis.

UNR-Rohn-Division(309) 697-4400
 of UNR Inc.
 PO Box 2000

Peoria, IL 61656
 PERSONNEL: Donald Rohn, President; R. Kleine, Vice President/Sales & Marketing; Kenneth Cordrey, Eastern Div. Sales Manager; Larry Grimes, Central Div. Sales Manager; Fred Hardee, Midwest Div. Sales Manager

REGIONAL OFFICES: PO Box 106, Worton, MD 21678, (301) 778-4441; 2631 Tarna St., Dallas, TX 75229, (214) 241-7791; PO Box 609, Frankfort, IN 46041, (317) 654-4491; PO Box 170249, Birmingham, AL 35217-0249, (205) 841-1789.

DESCRIPTION: Manufacturers of tower and related accessory items for broadcast, microwave, mobile radio, equipment shelters, tower obstruction/lighting equipment and safety devices.

Underground Equip. & Supply Co. (713) 448-8444
 10006 Airline Dr.
 Houston, TX 77037

PERSONNEL: Bill Edwards, President/Sales Manager; Don Edwards, Vice President
 DESCRIPTION: Manufacturer of earth boring machines for drilling under roads, streets, driveways; from 2-24 diameter, 200 ft. in length; wet, dry compaction types, hand held, wheel, track models, above ground or below ground drilling; accurate, portable, low maintenance quality, long line machines, designed for utility work.

Underground Piercing Inc.(612) 425-4172
 PO Box 225
 Osseo, MN 55369

PERSONNEL: Virgil Dittes, President; Jim Dittes, Vice President
 DESCRIPTION: We specialize in boring streets, driveways, sidewalks, lawns and shrubs, etc. We have mobile units designed specifically for underground boring and pipe or conduit installation.

United Satellite Systems(218) 681-5616
 Route One
 St. Hilaire, MN 56754

PERSONNEL: Doug Dehnert, President; Polly Dehnert, Vice President; Dave Strong, Sales Manager
 DESCRIPTION: USS manufactures equipment for CATV headends. We manufacture satellite antennas from 3.8 to 7.6 meters. The satellite antennas are constructed of durable fiberglass and backed by rugged, galvanized mounts. Our headend products include the SRA-500S satellite receiver and MDA-300/MDA-450 frequency turntable modulator.

Universal Electronics Inc.(614) 866-4605
 4555 Groves Road
 Ste. 13

Columbus, OH 43232
 PERSONNEL: Thomas Harrington, President; Tim Harrington, Vice President; S. Cohen, Sales Manager

DESCRIPTION: Manufacturer and distributor Coax-Seal products. Coax-Seal is a new pliable plastic connector sealant used in microwave, satellite, SMATV, CATV installations. Products are used to waterproof coaxial connectors and all other types of RF equipment hook-ups from the largest to the smallest. Basically is known as a cable sealant-154 cable sealant, 222 sealant tape.

UNIVERSAL REMOTE SYSTEMS, INC.
 A division of Cable Exchange, Inc.

Universal Remote Systems Inc.(303) 694-6789
WATS(National)(800) 777-CBLX
 5730 E. Otero Ave.

Englewood, CO 80112
 PERSONNEL: Harold Bjorklund, President
 DESCRIPTION: Manufacture and supply fully universal IR (infrared) remote control units.

Vermeer Manufacturing(515) 628-3141
 PO Box 200
 New Sharon Road

Pella, IA 50219
 PERSONNEL: Bob Vermeer, President; Mary Vermeer Andringa, President; Pat Weiler, Vice President/Engineering; Lyle Borg, Vice President/Sales & Marketing; Carl Boat, Vice President/International Sales

DESCRIPTION: Manufacturer of Industrial Equipment; trencher, cable plows, concrete cutters, asphalt cutters, backhoes, and boring tools.

Vibra-King Inc.(507) 387-6574
WATS(National)(800) 533-2077
 Box 247

Mankato, MN 56001
 PERSONNEL: C. Brahler Jr., Vice President; Dave Holcomb, Sales Manager; Rich Prosser, Product Manager

REGIONAL OFFICES: 806 24th St., Spirit Lake, IA 51360, (712) 336-1024, David Alig; 7291 Corsican Dr., Unit C, Huntington Beach, CA 92647, (714) 841-2158, Matt Hannafin; 323 Sparrow Ct., Hunters Crossing, Three Bridges, NJ 08887, (201) 788-7671, Brian Mattson; 767 Inland Circle, #1A, Naperville, IL, 60540, (312) 416-9186, Stu Senska; 5023 N. 18th St., #58 Phoenix, AZ 85016, (602) 277-6646, Al Voeltz; 212 Lakeshire Dr., Lexington, SC 29072, (803) 359-9620, Eddie Ward; PO Box 1381 Marietta, GA 30060, (404) 422-0757, Randy Benhart, 31941 S. Wiggins, Magnolia, TX 77355.

DESCRIPTION: Accupunch is an underground piercing tool for making bores under streets and driveways. Our machines are extremely accurate, and have the ability to pull pipe. Recently available is our new 1 3/4 machine just for the cable TV market.

Video Data Systems(516) 231-4400
 30 Oser Ave.
 Hauppauge, NY 11788

PERSONNEL: William Leventer, President; Stephen Seiden, Vice President/Marketing; Paul Seiden, Sales Manager

REGIONAL OFFICES: Omnivue Inc., 274 Madison Ave., New York, NY 10016, (212) 532-5576, Harry Glass; Vica Associates, 4296A Memorial Dr., Decatur, GA 30022, (404) 292-7506, Dave Comstock; George Constantine & Assoc., 9928 Culppeper Dr., Carmel, IN 46023, (317) 844-2001; Mega Hertz, 4001 Airport Freeway, Ste. 590, Bedford, TX 76021, (817) 354-7500, Doug Sherar; Innovative Concepts, 927 W. Olive Ave., Ste. B, Burbank, CA 91506, (818) 848-1234, John Stead; 11712 Highview Ave., Wheaton, MD 20902, (301) 942-2092, Stash Michalski; Mega Hertz, 6940 S. Holly Circle, Ste. 200, Englewood, CO 80122, (303) 779-1717, Steven Grossman; Applied Technologies Marketing Inc., 3975 Suffolk Lane, Hoffman Estates, IL 60195, (312) 934-6262, David Everett.

DESCRIPTION: Automated program originator systems including character generator graphic display, prompting systems and integrated insertion

control systems. Character generator systems incorporating real time schedulers, switching systems and computer downloading, teleproduction titling systems. Vertical interval data transmission (VITL), encoding and decoding data within a picture signal.

Video Tape Systems Inc.(205) 533-5138
 727-E Arcadia Circle
 Huntsville, AL 35801

PERSONNEL: Jerry Knight, President
 DESCRIPTION: Provides commercial insertion equipment for cable networks.

GENERAL INSTRUMENT

VideoCipher/General Instrument (619) 455-1500
 6262 Lusk Blvd.
 San Diego, CA 92121

PERSONNEL: Doug Lindquist, Vice President/Marketing; Chuck Uhl, National Sales Manager
 DESCRIPTION: Manufacture satellite television systems, including VideoCipher descramblers for consumers and cable headends.

Videophile Inc.(303) 770-7000
 4582 S Ulster St. Pkwy.
 Ste. 1300

Denver, CO 80237
 PERSONNEL: Jeffrey Gutfreund, President; Steven Barber, Vice President
 DESCRIPTION: Local Area Network Design, installation. Distributors of videoconferencing services, cable television and SMATV design and construction, local area network design and construction, headend, satellite dish, microwave and distribution network construction. Related services through Coaxial Analysts Inc., Coaxial Construction Corp. and Coaxial Capital Corp.

Videotech Services Inc.(213) 970-9012
 4505-D W Rosecrans Ave.
 Hawthorne, CA 90250

PERSONNEL: Hugo Munoz, President/General Manager
 DESCRIPTION: Provides maintenance and repair service of CATV equipment, line and distribution amplifiers, field strength meters, headend and CCTV gear, system troubleshooting and FCC compliance tests.

Videotek Inc.(215) 327-2292
 243 Shoemaker Road
 Pottstown, PA 19464

PERSONNEL: Philip Steyaert, President; Peter Choi, Vice President/Sales
 DESCRIPTION: Videotek manufactures a comprehensive line of: color receiver/monitors, professional rackmount color monitors, waveform monitor, vectorscope, combination waveform monitor/vectorscope, distribution amplifiers for video, audio, pulse and subcarrier signals, routing switchers, demodulators and audio program monitors.

Viewsonics Inc.(516) 921-7080
WATS(National)(800) 645-7600
 170 Eileen Way

Syosset, NY 11791
 PERSONNEL: Abram Ackerman, President; Cynthia Brown, Sales/Marketing Liaison
 DESCRIPTION: Manufacturer of the Lockinator Security System (patented), specialized security enclosures, broadband amplifiers, our new "Broad-Lan" prepackaged LAN network, rack mounting panels, combiners, kits, RFI passive and FM

"The 'universal' remote unit was taken one step further by Universal Remote Systems."
Communications Engineering and Design

The Universal *Difference.*

The difference in universal remote control units is **UNI-WAND**. The state of the art, user friendly, programmable hand controller. The **UNI-WAND** eliminates remote clutter, simplifies subscriber operation and will never become obsolete.

Audio/Visual Compatible

The UNI-WAND enables the subscriber to control any product including CATV converters, pay per view services, all VCRs, all CD players and all TVs manufactured with IR remote capability. The UNI-WAND can control up to eight completely different devices at one time!

Latest Technology

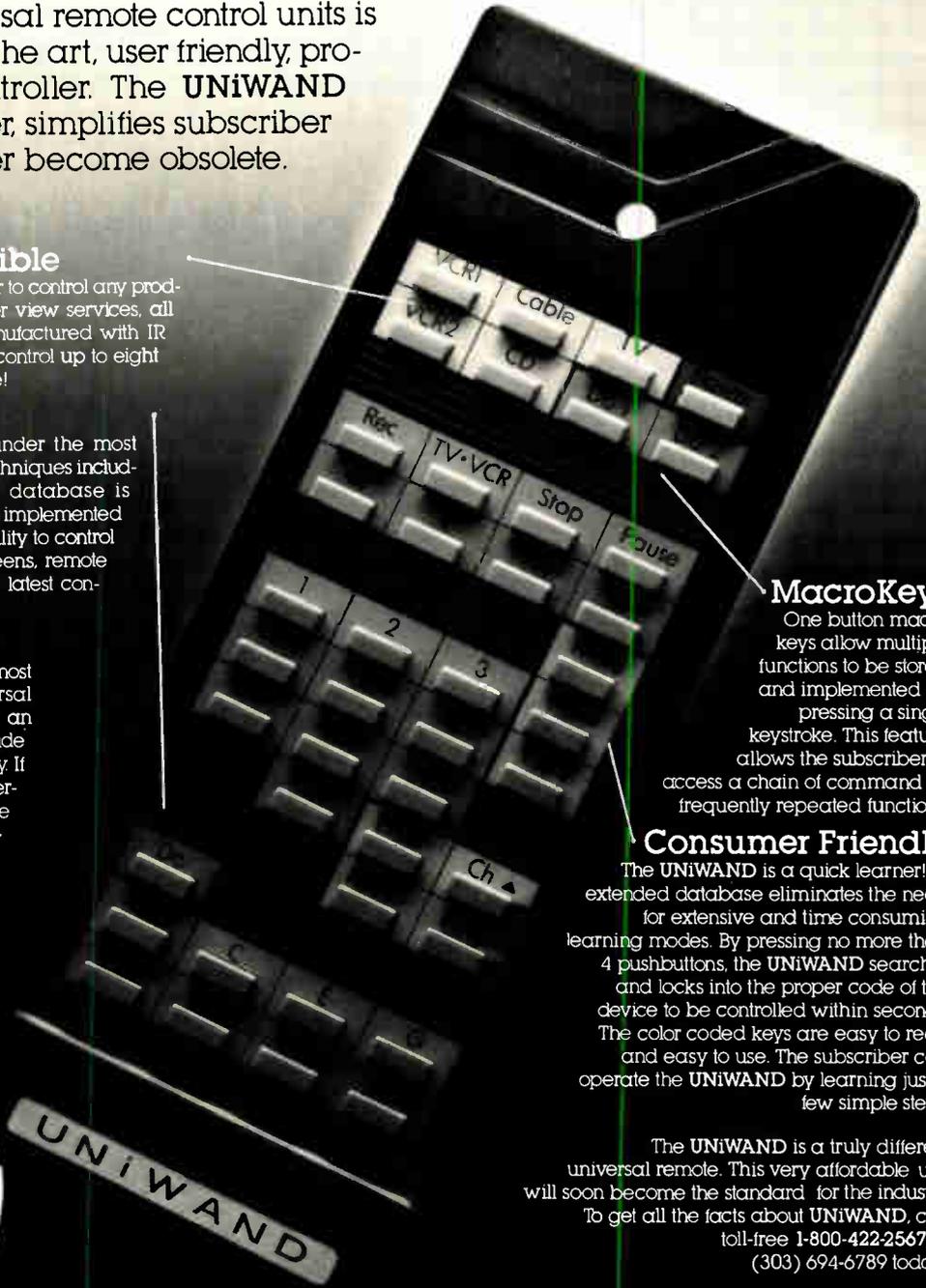
The UNI-WAND is manufactured under the most recent state of the art manufacturing techniques including surface mount technology. The database is updated continuously as new codes are implemented by the manufacturers. It has the capability to control most special features such as split screens, remote color and tint controls available on the latest consumer electronic products.

Never Obsolete

The UNI-WAND is the simplest and most cost-effective reprogrammable universal remote. This unit is programmed via an IBM PC or compatible computer to include any future advancements in technology. If a subscriber should purchase an entertainment product that was not available at the time he/she received the UNI-WAND remote, the controller can be updated at the cable office or any one of the 820 CBA service centers nationwide. This feature will insure that the UNI-WAND will never become obsolete as product lines change.



The RS 232 port built into the back of the UNI-WAND enables its updated data library to control the latest products available!



MacroKeys

One button macro keys allow multiple functions to be stored and implemented by pressing a single keystroke. This feature allows the subscriber to access a chain of command for frequently repeated functions.

Consumer Friendly

The UNI-WAND is a quick learner! Its extended database eliminates the need for extensive and time consuming learning modes. By pressing no more than 4 pushbuttons, the UNI-WAND searches and locks into the proper code of the device to be controlled within seconds. The color coded keys are easy to read and easy to use. The subscriber can operate the UNI-WAND by learning just a few simple steps.

The UNI-WAND is a truly different universal remote. This very affordable unit will soon become the standard for the industry. To get all the facts about UNI-WAND, call toll-free 1-800-422-2567 or (303) 694-6789 today!

UNIVERSAL REMOTE SYSTEMS, INC.

A division of Cable Exchange, Inc.

Also available from Burnup & Sims, (303) 694-6446

Vital Industries Inc.

devices, digital multimeters, protective cases, poleline construction and installation materials. Private label and custom design products. Product and service information upon request.

Vital Industries Inc. (904) 378-1581
3700 NE 53rd Ave.

Gainesville, FL 32601

PERSONNEL: C. Donoyan, President; Linda Buickel, Vice President Sales

DESCRIPTION: Video switching systems on-air video/audio switching, systems, video and audio distribution systems, pulse distribution, video effects generators, TV automation, frame synchronizers and manipulators.

Vitek Electronics Inc. (607) 796-2611
901 South Ave.

PO Box 111

Horseheads, NY 14845

PERSONNEL: John McQuaid, General Manager/ Vice President; Edwin Eschliman, Marketing Manager; Leonard DeRenzo, Sales Manager

DESCRIPTION: Pay TV security devices and test equipment; Narrow notch, audio and single through multi-channel traps; jumper traps, tracers (RF Leakage Detectors). Cannister traps.

WEMCO. (313) 777-4200
PO Box 80709

St. Clair Shores, MI 48080-0709

PERSONNEL: Gregory Behlin, President; Michael Green, Vice President; Steve Turk, Sales Manager

DESCRIPTION: Manufacturers of wire reeling, spooling and coiling equipment; storage rack systems; and custom equipment.

Walton Towers Inc. (717) 533-3635
Box 148B, RD #1

Hershey, PA 17033

PERSONNEL: Joann Brong, President; Paul Light, Operations Manager

DESCRIPTION: Install guyed towers to 500' and self-supporting towers to 400'. We install lightning systems, climbing and waveguide ladders, antennas, microwave dishes, mini-horns, transmission line, waveguide and other accessories on new or existing towers. Additionally, we align microwave dishes and horns, inspect, reguy, retension and paint new or existing towers.

Ward Enterprises. (716) 675-6661
157 Seneca Creek

Buffalo, NY 14224

PERSONNEL: Kurt Ward, President

DESCRIPTION: Underground construction, contractor boring, plowing, trenching, splicing and service drops.

Warren L. Braun Consulting Eng. (703) 434-5965
PO Box 1106

Harrisonburg, VA 22801

PERSONNEL: Warren Braun, P.E., President;

Richard Shimp, Director; Donn Meyerhoeffer, P.E.

DESCRIPTION: Consulting services in CATV, microwave, closed circuit and industrial TV, industrial electronic control systems, telecommunications systems, sound systems, sound systems design and acoustics, R & D in each of the above fields.

Washington Cable Supply, Inc. . . (202) 783-0555
733 15th St. NW

Ste. 700

Washington, DC 20005

PERSONNEL: W. Henry Parker, President; C.

Ramon Wofford, Vice President; B. Parker, Sales

Manager

DESCRIPTION: Minority owned. Manufacturers' representative/distributor of CATV products and accessories, cable and wire products, pole line hardware, drop materials, tools and safety equipment.

WAVETEK

Wavetek RF Products, Inc. . . . (317) 788-5965
WATS(National). (800) 622-5515

5808 Churchman Bypass

Indianapolis, IN 46203-6109

PERSONNEL: Jim Walcutt, General Manager;

Jack Webb, Sales Manager

DESCRIPTION: Full line manufacturer of broadband cable and LAN test equipment including analyzers, signal level meters, signal leakage detectors, automatic test equipment, signal generators, system sweep, bench sweep, TVRO/ bench, set top converter test, accessories and components.

Weeks, John Enterprises. (404) 963-7870

WATS(National). (800) 241-1232

641 Grayson Hwy.

Lawrenceville, GA 30245

PERSONNEL: John Weeks, President; Paul

Williams, Regional Salesman; Joe Acker, Regional

Salesman; Mel Odum, Regional Salesman; Ivan

Jones, Regional Salesman

REGIONAL OFFICES: 317 25th St. NW, Fayette,

AL 35555, (205) 932-7264; 6112 Eagles Nest Dr.,

Jupiter, FL 33458, (305) 747-3647, Paul Legris,

Sales Manager; 105 Mt. Vernon Dr., Albemarle,

NC 28001, (704) 983-5908; 2828 Venetian Garden,

Gulf Breeze, FL 32561, (904) 932-7422.

DESCRIPTION: Complete full line distributor for

installation materials, connectors, headend

equipment and cable. Pre-packed headend

capability. Also factory authorized Wavetek service

center.

Wegener Communications Inc. . . (404) 623-0096

Technology Park/Johns Creek

11350 Technology Circle

Duluth, GA 30136

PERSONNEL: Robert Placek, President; Heinz

Wegener, Vice President

REGIONAL OFFICES: 111 Industrial Dr., Whitby,

ONT L1N 5Z9, Canada, (416) 666-1661.

DESCRIPTION: Products for mono and stereo

audio and data transmission via satellite, cable,

fiber optic, and terrestrial microwave. Products

include subcarrier modulators, FM stereo generators

and modulators, and stereo synthesizers. Data

transmission products for satellite, cable, fiber

optic, and terrestrial microwave distribution of

general data, teletext, vertical interval and other

digital information.

Weldone Trading Company, Inc. . (514) 381-8861

(514) 387-2503

1401 Legendre W

#106

Montreal, PQ, H4N 2S2

PERSONNEL: Murray Shenkman, President/

Sales Manager

DESCRIPTION: Manufactures tower cable clips-

sizes to fit all cables including quad and double

shielded coaxial for single and dual systems.

Available in black, white and grey. Plated,

hardened steel masonry nails. Pre-assembled

ready for use. Sure fit for quick, simple installation.

Sold by most leading distributors.



WESTEC COMMUNICATIONS, INC.

Westec Communications Inc. . (602) 948-4484

14405 N Scottsdale Road

Scottsdale, AZ 85254

PERSONNEL: Robert O'Hara, President; Keith

Larsen, Operations Manager; Charles Bissegger,

Vice President/Engineering; Candy McKay, Office

Manager; Gene Templeton, Business Manager

DESCRIPTION: Manufacturer of solid state sources

for the commercial and military markets. Repair

and service microwave equipment. Products serviced

include solid state sources and upconverters for

the Hughes AML microwave.

Western CATV Distributors, Inc. . (213) 539-8030

WATS(National). (800) 551-2288

WATS(State). (800) 641-2288

3430 Fujita Ave.

Torrance, CA 90505

PERSONNEL: Bill Ewing, President; Dave Herman,

Vice President Engineering; Chris Ewing, Sales

Manager

DESCRIPTION: Distributor of cable TV

components. Total CATV repair center, authorized

Magnavox warranty. Engineering services.

Western Towers. (915) 658-6539

WATS(National). (800) 622-6539

PO Box 2040

San Angelo, TX 76902

PERSONNEL: W.L. Anderson, President; Daniel

Anderson, Vice President

DESCRIPTION: Manufacture full line of guyed

towers—3 standard sizes. Erect, maintain and sell

tower accessories, including lighting, electronic

flasher control units, out-riggers and antenna

mounts. Also full line of VHF log periodic

antennas, and 450 MHz communications antennas.

White Radio Ltd. (416) 632-6894

940 Gateway Dr.

Burlington, ONT, L7L 5K7

PERSONNEL: David Martin, President; Richard

Martin, Vice President; J.D. Little, Vice President;

Richard Kelly, Sales Manager

REGIONAL OFFICES: Montreal, Quebec, H4B

2M8, (514) 481-0158; North Vancouver, BC, V7P

1M7, (604) 984-4301; Calgary, Alberta, T2G 4B7,

(403) 243-0055; Edmonton, Alberta, T6B 2P5,

(403) 468-6916; Winnipeg, Manitoba, R3H 0M7,

(204) 633-6354.

DESCRIPTION: We are manufacturers'

representatives who sell to the Canadian CATV

industry. Exclusive product lines to White Radio

in Canada are: Belden, Oak Communications, Oak

Satellite, Blonder-Tongue, Canusa, Master

Appliance, SED, Augat/LRC, H.O.M.E.

White Sands CABLE COMPANY

White Sands Jumper Cables. . (602) 726-4908

3780 S 4th Ave. #2D

Yuma, AZ 85364

PERSONNEL: Homer Harmon, President; Kathy

Harmon, Sec/Treas.

DESCRIPTION: Manufacture CATV jumper cables.

Wide Band Engineering Co. Inc.. (602) 254-1570
 PO Box 21652
 Phoenix, AZ 85036
PERSONNEL: S. Ticknor, President; M. Ticknor, Sales Manager
DESCRIPTION: Manufacturers of 1-900 MHz RF test instruments, including sweep amplifiers, comparators, impedance bridges, terminations, directional couplers, hybrid power divider/combiners, RF switches, filters, RF detectors, impedance transformers, DC blocks, etc.

Williams, L.W. Contractor Inc.. (502) 651-5638
 Rte. 3 Box 46-A
 Glasgow, KY 42141
PERSONNEL: L. Williams, President; James Myers III, General Manager
DESCRIPTION: CATV contractor: aerial, underground, splicing, installation, etc.

World Video Library Inc.. (817) 877-0266
 613 North Freeway
 Suite 108
 Fort Worth, TX 76102
PERSONNEL: John Ratliff, President; Joseph Sigler, Vice President/Operations
DESCRIPTION: Manufacturer, distributor, and service representative of the "Impulser" system which provides pay-per-view equipment and software. The "Impulser" upgrades one way addressable systems to impulse pay-per-view WV. Also provides early window movies for "Impulse" pay-per-view customers.

Worrell, JM Comm.. (404) 586-9152
 Construction Corp.
 38 Haynes St. NW
 Atlanta, GA 30313
PERSONNEL: John Worrell, President; Beverly Worrell, Vice President; Alyce Kimball, Administrative Coordinator
REGIONAL OFFICES: 8695 NW 64th St., Miami, FL 33166, (305) 592-9785.
DESCRIPTION: Install and construct communications systems, e.g. Cable TV, PA Systems, CCTV Systems, radio antenna, underground, telephone and intercom systems, uninterruptible power systems, commercial and industrial electrical work.



Zenith Cable Products Div.. (312) 391-7000
 1000 Milwaukee Ave.
 Glenview, IL 60025
PERSONNEL: James Faust, President; Vito Brugliera, Vice President/Mktg.—Prod. Div.; Charles Eissler, Vice President/Sales; John Bowler, Vice President
REGIONAL OFFICES: 1130 E. Sleepy Hollow, Ste. A, Olathe, KS 66062, (913) 764-5554, Michael Adams; 2022 Powers Ferry Road, Ste. 180, Atlanta, GA 30339, (404) 951-8425, Robert Cunningham; Londonderry Professional Park, Ste. 4B, Routh 102, Londonderry, NH 03053, (603) 434-2830, Barry Hardek; Zenith Radio Canada, Ltd., STV/CATV Div., 1020 Islington Ave., Toronto, ONT M8Z 5X5, (416) 231-4171, Glen Andrews.
DESCRIPTION: Zenith offers a complete line of cable products including Z-TAC baseband addressable decoders, PM RF addressable converters. Pay-Master add-on decoders, impulse pay-per-view (IPPV) systems. Z-View for two-way cable system; Phonevision/ANI telephone system for one-way cable systems. SSAVI, STV and

MMSD addressable baseband decoders; Z-LAN data and communications products; VCR interface and TAC-timer.

Zephyrus Electronics Ltd.. (918) 834-1229
 1550 North 105 East Ave.
 Tulsa, OK 74116
PERSONNEL: Ted Anderson, President; Bill Johnson, Vice President
DESCRIPTION: Manufacturer of satellite sub-carrier receivers and associated equipment. Repair service for commercial satellites receivers and modify commercial satellite receivers for descramblers.

dB Communications, Inc.. (201) 446-3612
 WATS(National).. (800) 526-2332
 490 Rte. 33 W
 Englishtown, NJ 07726
PERSONNEL: James Miller, President; Linda Lotti, Sales Rep.
DESCRIPTION: We represent these leading manufactures exclusively in northeast: Broadband, Control Tech, EEG, Texscan/Compuvid, Vitek, LRC Electronics, Insulation Systems, NuMedia Corp., Panasonic, and Multi-Link. Distribute Videotek and Panduit, Blonder Tongue, A/B switches, cable and Lanca Instruments. dB Communications is also an authorized Sony dealer and service center.

1987 Buyers' Guide Staff

EDITORIAL

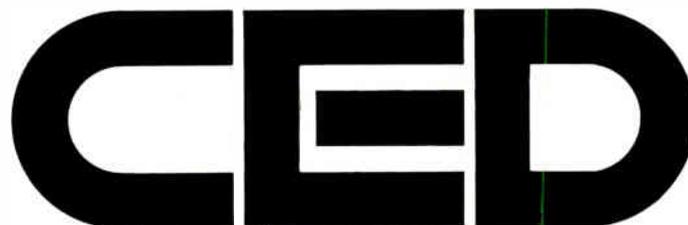
Gary Y. Kim, Publisher
Kathy Berlin, Editor
Linda J. Johnson, Production Editor
Paula Bley, Research Assistant

PRODUCTION

Jeff Knight, Production Director
Don Ruth, Art Director
Debra Rensel, Assistant Production Director
Debbie Van Dyke, Production Assistant

ADVERTISING

Cathy Wilson, National Sales Manager
Judy J. Medley, Account Executive,
 Classified Sales Manager



Q.

I'm a CATV supplier and my listing was left out of the 1987 CATV Buyer's Guide. How can I make sure I'm not left out next year?

A.

Call or write Kathy Berlin with information regarding your company and its personnel to make sure you are included in the next Buyers' Guide. Kathy can be reached at P.O. Box 5208 TA, Denver, Colo. 80203 or by phone at (303) 860-0111.

Q.

My listing in the Buyers' Guide is wrong. What do I do now?

A.

Again, call or write Kathy Berlin at the address or phone number listed above. Tell her what the problem is and she'll be glad to correct it so it's right when the next Buyers' Guide comes out.

Q.

How can I get my own subscription to *CED* magazine?

A.

It's simple. Just fill out the response card bound inside the magazine, sign it and drop it in the mail. We take care of the rest. Please give us 30 to 60 days to process the subscription request. After that, all you have to do is fill out a new subscription card and sign it once every year to make sure you continue to receive your own copy of *CED*.

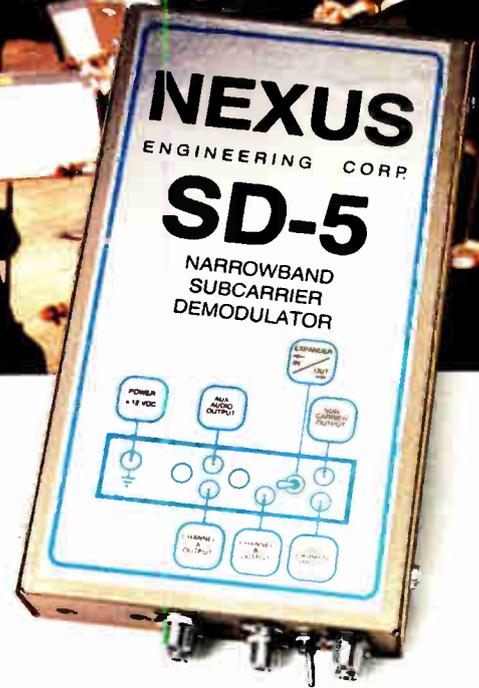
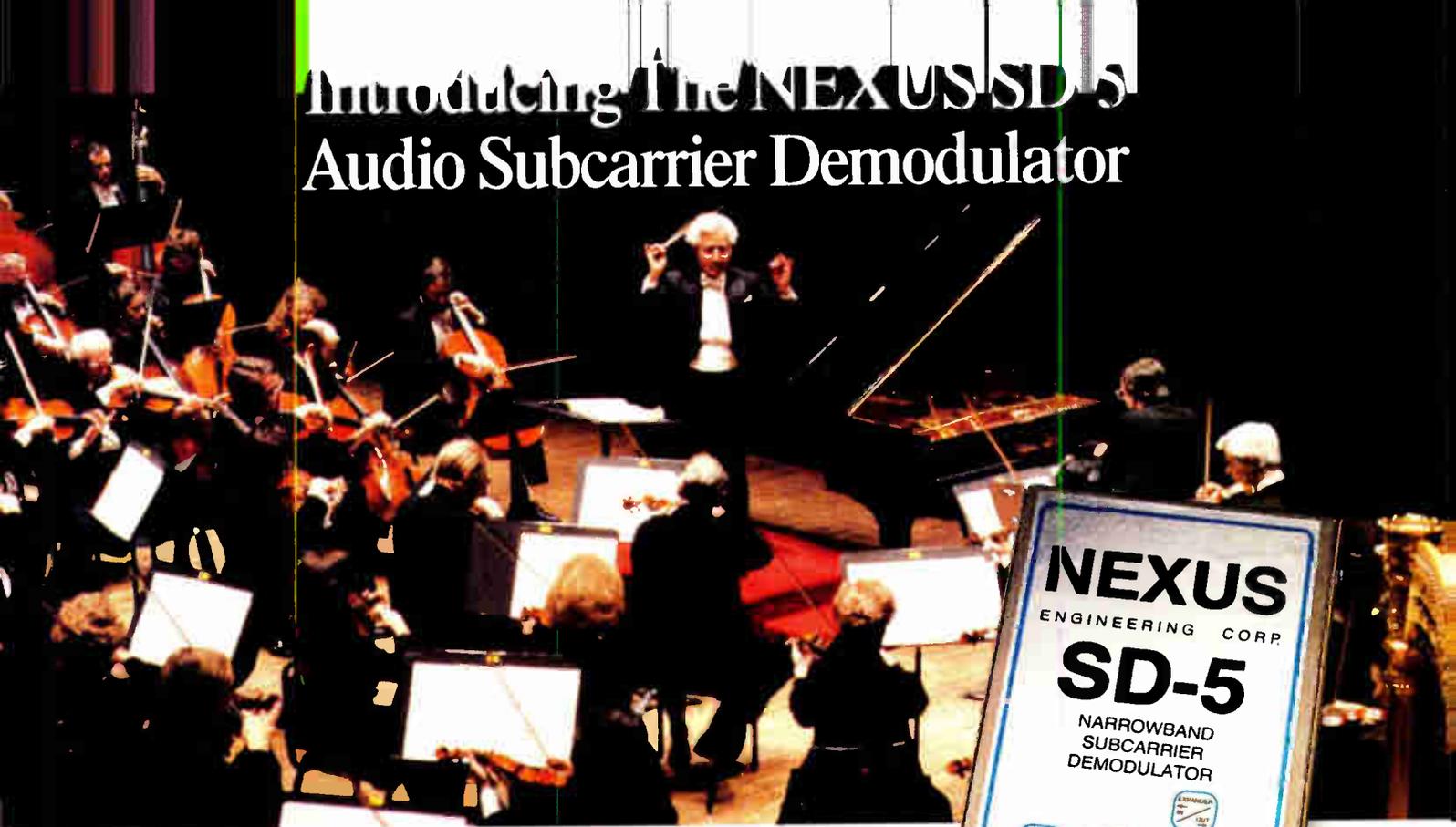
Q.

I recently moved. How do I make sure my copy of *CED* continues to come to me?

A.

Fill out the change of address card bound into every issue and drop it in the mail. That way, you can be sure of getting your copy of *CED* when you're supposed to, without long delays.

Introducing The NEXUS SD-5 Audio Subcarrier Demodulator



The Newest Performer In The Nexus Line Of Stereo Products.

The New SD-5 Subcarrier Demodulator: A Great Little Performer in the Nexus Tradition.

Whether it's the SD-5 wideband or narrowband model, your CATV or private cable system can now have the sound it deserves—at a price you can easily afford.

We Never Play Second Fiddle

The SD-5 demodulates all subcarrier audio signals. It introduces less than 1% total harmonic distortion and maintains a signal-to-noise ratio of greater than 60dB, assuring excellent sound quality.

Treble Benefit

While the SD-5 can solo with other makes of headend equipment, it really makes beautiful music with the other stars in the Nexus stereo line. Combined with the SG-5 stereo generator and FM-5 audio frequency modulator, popular stereo services can

be easily added on your FM band, giving your subs more choices—you more income.



Our three great performers fit into just one standard rack space!

The Grand Finale

You can buy the SD-5 for a song. Compare its price, performance and our 2 year limited warranty, and we know you'll be impressed.

Find out more about the Nexus line of audio products. Send in the coupon or call for our free product catalogue.

TELEPHONE: (206) 644-2371
BELLEVUE, WA
(604) 420-5322
BURNABY, B.C.
FAX: (604) 420-5941
TELEX: 961000
MAILBOX: *XPI8348

WRITE: NEXUS ENGINEERING CORP.
7000 LOUGHEED HWY.
BURNABY, B.C. V5A 4K4

NEXUS
ENGINEERING CORP.
PERFORMANCE
YOU CAN SEE.

Hear

POWERFUL DETECTION IN THE PALM OF YOUR HAND



Now there's an inexpensive leakage detection device that can provide your installers with the power of leakage detection. Imagine eliminating most of your recalls! **THE SNIFFER JR.** is a pocket-sized detection device that is so easy to use, leakage monitoring will become second nature almost immediately. Eliminate the bothersome duty of regaining entry to installation locations and do away with faulty hook-ups! All for under \$100.00!

SNIFFER JR.



ComSonics INC.
AN EMPLOYEE OWNED CORPORATION

CALL TOLL FREE 1-800-336-9681 IN VIRGINIA CALL COLLECT 1-703-434-5965

See us at the Atlantic Cable Show, Booth #560.

Reader Service Number 38

Your leakage detector ...

Because of its inherent nature, some leakage will always occur in any coaxial system, regardless of the efforts to control it. In implementing its CLI and leakage monitoring regulations, the intent of the FCC was not to eliminate leakage, but to ensure that cable system operators were aware of the problems created by leakage and to define some maximum permissible levels which would provide for the safety of other communications in shared spectrum areas. The limits have been defined for some time now, and in the eyes of the commission, the cable industry has not fulfilled its end of the bargain.

Issues and consequences

Methods and materials are available for cable systems to determine the extent and location of leaks and to repair the leaks. The commission, too, has the means to determine the extent and location of signal leaks. And the commission has the power to levy heavy fines against cable operations violating the leakage rules.

But the consequences go beyond potential fines. How many operators can afford to construct a 400 MHz system, then operate with only 19 channels? This possibility does exist. Any operator who cannot comply with the minimum acceptable limits on signal leakage takes the risk of losing the use of the frequencies in the restricted bands. Furthermore, if the commission believes that the CATV industry is incapable of controlling signal leakage, it may react by limiting the use of these spectrum areas on an industrywide basis.

Several people comment that they are not overly concerned with ground monitoring because they are planning a flyover to meet CLI measurement requirements. These people are mistaken in their understanding of the commission's requirements. CLI measurements are *in addition* to the required quarterly monitoring of the cable plant.

A simple way to separate these two measurements is to think of quarterly

... don't leave home without it.

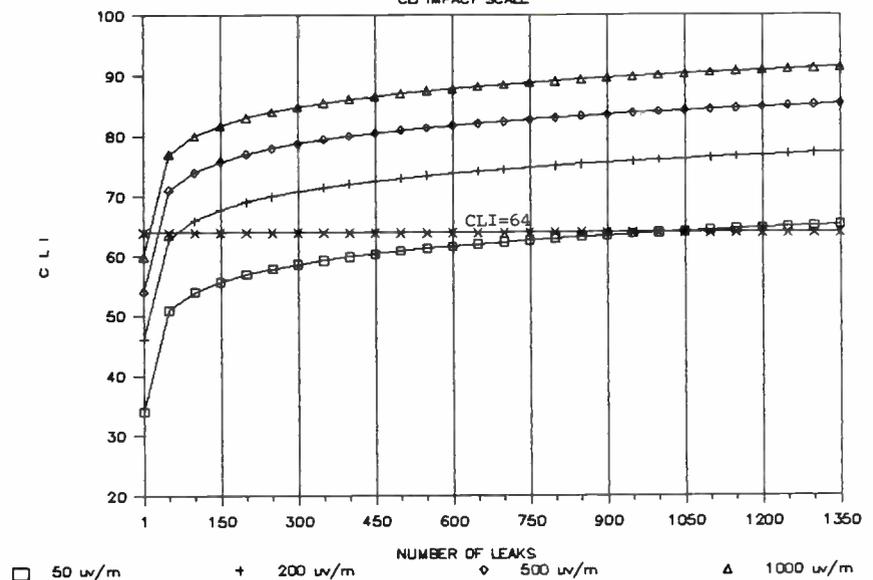
ground monitoring as a method of identifying individual leaks, and the CLI as a cumulative measure of the combined effect of all leaks which are present in the system at the time of the measurement, as implied by Cumulative Leakage Index. Quarterly ground monitoring entails a program of regular, ongoing monitoring. The CLI, on the other hand, addresses annual measurements which can be equated to a proof of performance evaluation of the ongoing monitoring process.

For quarterly ground monitoring, the commission requires a program of regular monitoring for signal leakage by substantially covering the plant every three months. Any leaks in excess of 20 microvolts per meter must be documented and corrected within a "reasonable" period of time. While there is no clear definition of "reasonable" contained within the rules, good engineering practices would dictate that leaks in excess of 50 microvolts per meter be corrected immediately, and all other leaks as soon as possible.

There are no restrictions on methods to meet the quarterly monitoring requirements, but our options are limited. If cost-effective methods were available to identify sources and intensities of individual leaks from an airborne location, the process of monitoring could be greatly streamlined. Currently, this is not the case and aerial monitoring cannot be used to detect individual, simultaneous leaks and their additive effect in a large cable plant. Ground-based monitoring is our best, present alternative.

The most popular procedure is to issue leakage detectors to as many technicians as possible, in order to cover as much of the plant as possible within a given period of time. And indeed, substantial plant coverage on a quarterly basis is likely to be achieved if numbers of technicians do the ongoing monitoring and also are responsible for repairing the detected leaks. But keep in mind that technicians are not always motivated to find and fix leaks, particularly in older systems where there may be lots of leakage sources. One method that has met with success is to assign one or more technicians solely to finding leaks, but not to fixing them. This cuts down the tendency to ignore leaks.

FIGURE 1
ATC PROJECT ENGINEERING
CLI IMPACT SCALE



By Ron Wolfe, Project Engineer,
Engineering and Technology, ATC

Eagle TRAPS



The Great Trap Test!

Compare these features with the competition:

FEATURES	MANUFACTURERS		
	EAGLE	A	B
100% Urethane filled (Weather Resistant)	■		
Single Board Construction (Improved Grounding)	■		■
Dual "D" Rings (Weather Resistant)	■	■	■
Blocking Capacitor (Reduced Theft)	■		
Metal Shields Available (Reduced Theft)	■		
Made in USA	■	■	
Special Design Multichannel Traps	■	■	
Metal-Stamped Channel I.D.	■		■

**(800)
448-7474**



4562 Waterhouse Road
Clay, NY 13041
(315) 622-3402

Reader Service Number 39

Amateur radio operators, 'hams,' on your staff are a resource in dealing with signal leakage.

Regular calibration of detection equipment is essential. With the increased emphasis on leakage monitoring, many operators have moved toward the use of less expensive equipment in greater quantities. This is certainly an acceptable alternative, provided the inherent loss of sustained accuracy is compensated for by frequent comparison of the detectors to a known leak.

Amateur radio operators, "hams," on your staff are a resource in dealing with signal leakage resulting in interference on the airwaves used by hams. Cable staff who are also hams should be encouraged to make their cable affiliation known to other ham operators in the area in order to help both sides where frustration occurs. Leakage problems are likely to be more pleasantly resolved and corrected in this way, than with FCC involvement, and besides, both sides benefit from the relationship. The ham operators, hopefully, can get more immediate satisfaction through the responsiveness of the cable operators than through FCC bureaucratic channels. And cable operators have an opportunity to correct a problem before it results in a fine, and to maintain a positive community image by establishing an atmosphere of cooperation.

CLI measurements, discussed next, can be a great resource to managers by helping to evaluate the overall effectiveness of the entire leakage monitoring effort.

The CLI requirement

The commission has delayed the requirement for CLI measurements until July 1, 1990. At first glance this seems a long way off. But July 1, 1990, is a deadline for *compliance*, not for a program to meet compliance. Programs for leakage detection and correction should start now. That was the commission's intent—i.e., to allow for a period of readiness. Systems with large plants and limited resources that have not begun to address this requirement may already have waited too long.

It is essential that system engineers know where their system stands today with regard to the future requirements, because the degree of improvement necessary will have a direct effect on the type of program that must be implemented. A rough CLI can be

calculated with any percentage of the plant, although when the new rules go into effect a minimum of 75 percent of the plant must be used for the calculation. A reasonable starting point would be to monitor 20 percent of the plant and use the data to calculate a CLI for the system. If this figure is far above or below the acceptable limits, the size of the sample can be increased, thus increasing the accuracy of the results. When using a small sample, it is important to include areas of the system that are known to have leakage, as well as tighter areas. The information gathered from this initial analysis will be useful to management in understanding and substantiating the need for a regular program of leakage monitoring and correction.

If there is anyone who doesn't yet appreciate how difficult it will be to meet the CLI requirements, the graph (see Figure 1) will provide some insight. For simplicity, it is assumed that all leaks detected are of the same field intensity. The Y axis of the graph gives the resulting CLI for a number of equal leaks along the X axis. At any point where the result lies above the reference line of CLI = 64, the system would be out of compliance. Keep in mind that these calculations are based on 100 percent of the plant having been monitored. Lesser percentages of the plant monitored would result in a proportionately higher CLI result.

There are other methods to determine plant status in relation to the forthcoming CLI requirements. There is at least one company prepared to perform air space measurements of CLI. There may appear to be an attractive alternative to monitoring the entire plant, because the results would be immediately available for the entire plant. Identifying the general locality of leaks should be possible. However, as previously mentioned, there is a major downside to this approach in that a flyover does not lend itself to pinpointing the leaks.

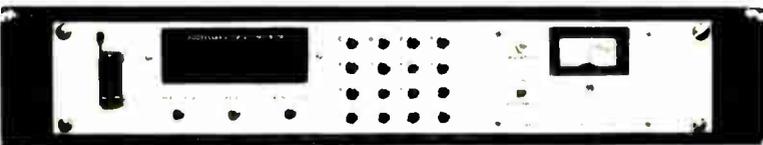
While cable operators may vary in how to assess current plant standing relative to 1990 minimal leakage requirements and what remedial actions to take, it is abundantly clear that the FCC will not vary in its approach. The FCC is serious about enforcement. Are you ready for their visit? ■

Picture if you will an addressable converter that thinks it's programmable.



BRAD

THE BRAD — DISC SIM II™



Whether it's your first step toward addressability or an alternate source for new converters, **BRAD'S** DIC-SIM II™ offers you both. No modifications are necessary — simply add the data simulator to your head-end and you can begin using addressable converters in your programmable system for as little as \$29.95 each. Upgrade or expand your system the easy way! Lease plans available as low as .30 per subscriber per month.

Call 1-800-382-BRAD EXT 157
IN NY CALL 1-518-382-8000

CLEARLY BETTER!

5906 Breckenridge Pkwy.
Suite I
Tampa, FL 33610
(813) 623-1721

Corporate Headquarters
1023 State Street
Schenectady, NY 12301
(518) 382-8000

4630 Pacific Hwy. East
Suite B-7
Fife, WA 98424
(206) 922-9011

Distortion testing of LAN systems

Distribution systems for transporting multiplexed data are generally comprised of high-quality CATV-type amplifiers and equipment. CATV systems are designed and specified so that noise and distortion caused by amplifier nonlinearities will not be noticeable in a TV picture, or at least will be within acceptable limits. Specification and testing of these systems has become standardized in the CATV industry, and performance and limitations for multi-channel video are well understood. LAN distribution systems are specified in the same manner and may be tested likewise, but relating specifications and data performance is not as straightforward due to the wide variety of data services and modem

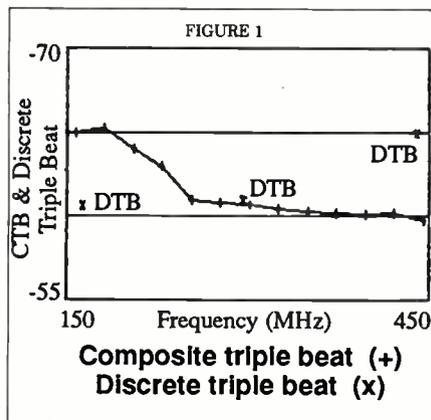
By Rezin Pidgeon, Principal Engineer, Scientific-Atlanta Communications Products Group

©IEEE, with permission. Transactions on Consumer Electronics, August 1987.

LAN testing varies from CATV testing.

characteristics.

Data rates may vary from perhaps 56 Kb/sec (or lower) in a 100 kHz bandwidth to 10 Mb/sec in a 12 MHz bandwidth. Broadband T-1 modems,



operating at 1.544 Mb/sec in a 750 kHz bandwidth, are widely used. In addition, data and video services may coexist in a LAN network. Thus, the distribution system operation criteria are system dependent.

However, certain basic measurements and tests are applicable to all systems, and these are reviewed in this paper.

Nonlinear distortion

In a simple analysis, amplifier nonlinearity may be expressed as:

$$V_o = A_1(V_i) + A_2(V_i)^2 + A_3(V_i)^3$$

The output voltage V_o is calculated in response to one or more sinusoidal signals V_i applied to the input. For CATV video applications, distortions are classified as (1) second order or composite second order, (2) composite triple beat, and (3) crossmodulation. In other applications, third-order distortion is also measured by a two-tone or three-tone test.

These distortions (as well as second harmonic, third harmonic, second-order intercept, and third-order intercept) are related by the coefficients A_2 for second order and A_3 for third order. In CATV terminology, these distortions may be defined as follows:

1. Second Order: Intermodulation of two signals producing distortions at $f_1 + f_2$ and $f_1 - f_2$. In a standard CATV frequency plan, these beats fall 1.25 MHz above and below video carriers. Beats 1.25 MHz below video carriers are not harmful since they fall at the channel boundary and need not be measured.
2. Composite Second Order (CSO): The sum (power addition) of all second order beats.
3. Composite Triple Beat (CTB): The sum (power addition) of all third order beats of the form $f_1 + f_2 - f_3$ and

TABLE 1

MAP Design Specifications

Carrier-to-noise ratio:	43 dB
Composite triple beat:	-53 dB
Crossmodulation ratio:	-53 dB
Single second order:	-60 dB
Single three-tone third order:	-60 dB
below three signals 12 dB above video reference level.	

CUE TONE SIGNALING

From Monroe Electronics



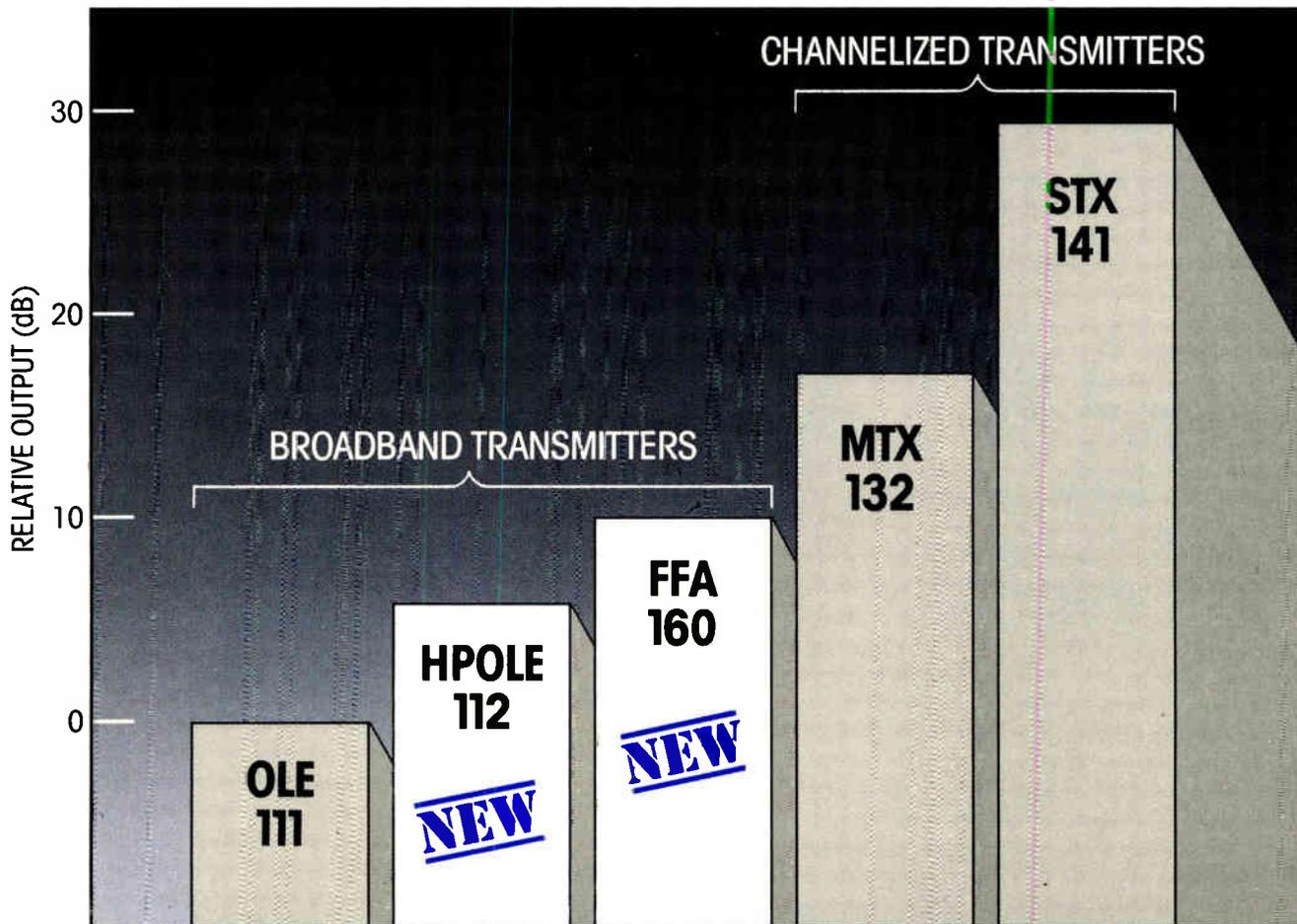
Monroe Electronics, the pioneer of cue tone signaling, offers complete systems for automatic, unattended operation of headend switching functions in response to network cue tones, remote telephone control or timed signals. Decodes DTMF signals transmitted over satellite transponders or telephone lines. Switches audio/video modulator input. Provides timing sequences for program source selection.

- Cue Tone Receivers and Encoders
- Relay Switcher Panels
- Program Timers

M **MONROE ELECTRONICS, INC.**
E
 100 Housel Avenue, Lyndonville, NY 14098
 Phone 716-765-2254 • Telex 75-6662 • Easylink 625-47-850

Reader Service Number 41

ONLY HUGHES GIVES YOU THE POWER OF CHOICE



HUGHES FILLS THE POWER GAP WITH TWO NEW LOW-COST BROADBAND SOLID-STATE TRANSMITTERS



Now Hughes gives you two new economical ways of delivering high quality cable TV programming to subscriber pockets.

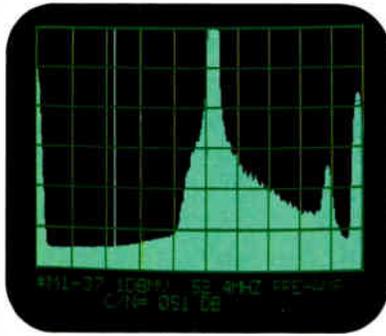
The HPOLE-112 broadband multichannel TV microwave transmitter delivers up to 60 channels of TV programming and provides 5dB more output power than the popular OLE-111 microwave line extender. This all solid-state transmitter accepts VHF inputs in the 54 to 450 MHz range and uses block upconversion techniques to reach the microwave transmitting frequencies of 12.7-13.2 GHz (CARS band).

Need more power? The new feedforward microwave power amplifier has it—and when used with the AML-OLE-111 line extender, provides up to 10dB additional output power. The

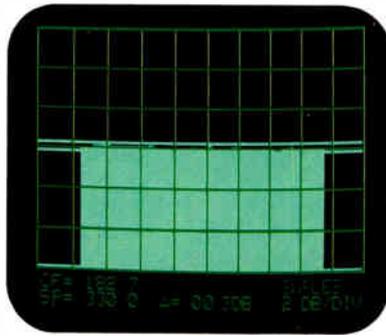
FFA-160 provides the full benefits of feedforward distortion cancellation across the 12.7-13.2 GHz frequency band, and, like the HPOLE-112, is housed in a temperature-controlled outdoor enclosure.

For the facts on either of these new broadband transmitters, or on any other Hughes system, contact Hughes Aircraft Company today. Hughes Microwave Communications Products, Bldg. 245, P.O. Box 2940, Torrance, CA 90509-2940, or call toll free (800) 227-7359, Ext. 6233. In California: (213) 517-6233. In Canada: COMLINK Systems Inc, 1420 Bayly Street, Unit 5, Pickering, Ontario L1W 3R4, (416) 831-8282.

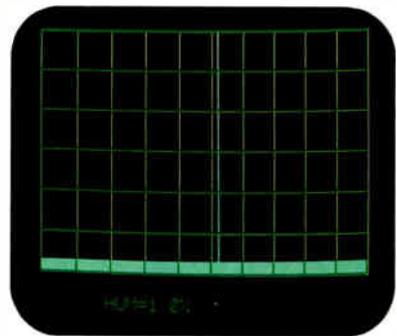




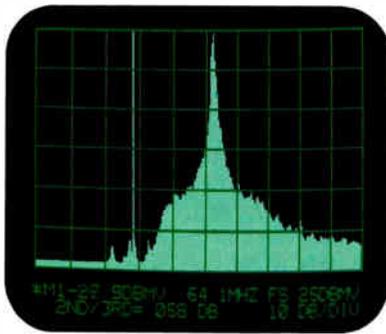
Improve picture quality.



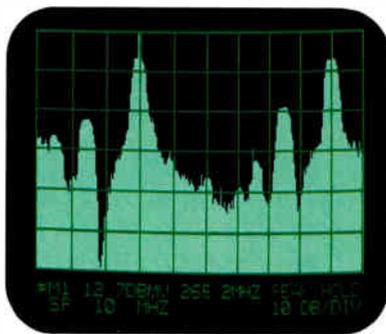
New Sweepless Sweep™ Analyzer for simple system balance.



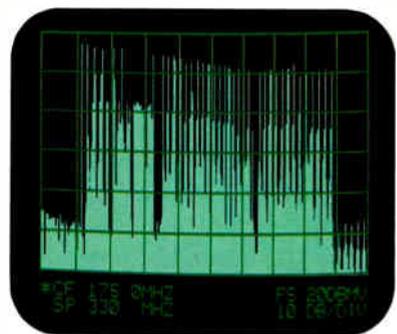
Minimize hum.



Pinpoint distortion problems.



Peak RMS of suppressed sync.



The whole picture, to 1 GHz.

Know it all.

Now you can measure frequency response on the same handy portable that brings you automated, all-in-one system analysis.

Without a sweep generator. Without always having to go to the headend. And with no subscriber interference whatsoever.

Wavetek's new Model 1882 Sweepless Sweep™ System Analyzer performs a full battery of signal level and distortion tests in the field, with pushbutton ease.

And now it sweeps without a sweep. Fast.



Now you can change sweep center frequency and span from the field. Use a vertical marker in "sweepless" mode to identify and zoom in on a response problem. Then, at the same setting, quickly switch to the spectrum analyzer

mode for an even closer look at what's happening.

Get a total check-up for your Cable TV system. Get the new Sweepless Sweep™ System Analyzer from Wavetek.

For a complete product brochure, write Wavetek RF Products, Inc., 5808 Churchman Bypass, Indianapolis, Indiana, 46203-6109. Or call 317-788-5965.

Introductory price \$9995.

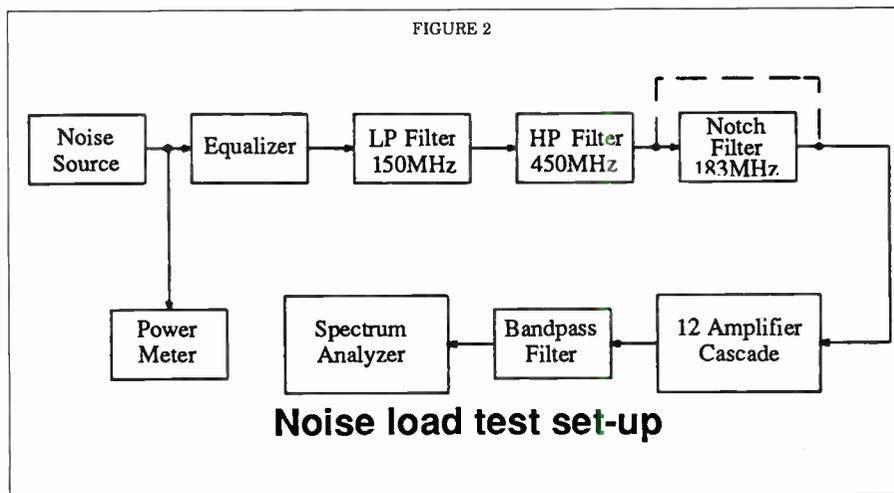
CATV distortion tests require a special purpose multi-carrier test generator.

2f1-f2. By convention, CTB is the distortion measured at video carrier frequencies, and for the standard frequency plan (video carriers offset 1.25 MHz above 6 MHz increments), other third order beats (3f, f1 + f2 + f3, etc.) are not included in the measurement and are not a factor.

4. Crossmodulation: Amplitude modulation of an otherwise unmodulated carrier caused by modulation of other carriers in the system. For the NCTA measurement, all interfering carriers are 100 percent synchronously modulated and the modulation impressed on an unmodulated carrier is measured.

Design and acceptance specifications of the broadband bus for Manufacturing Automation Protocol (MAP) applications are being established by the MAP/TOP Media Committee.¹

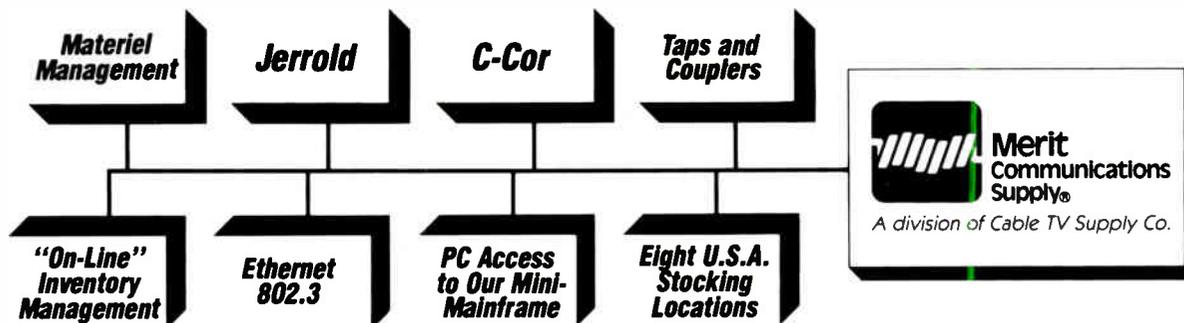
Similar criteria for LAN systems of the type IEEE 802.3 and 802.4 are under development by the IEEE 802.7



committee for Broadband LAN Recommended Practices but have not been released. Currently IEEE 802.4 specifies that the composite triple beat due to all signals on the cable be at most -57 dB.²

CATV distortion tests require a special purpose multi-carrier test generator to load the system with a CW carrier in place of each TV carrier assigned. This test equipment is expensive and may not be available to the

Avoid Costly LAN Delays.



merit

**BROADBAND
MAP
TOP**

YES! Send me info on: (Specify) _____

Name: _____
 Title: _____
 Company: _____
 Address: _____
 City, State, Zip: _____
 Phone: () _____

Mail to: Merit
 Communications Supply
 5922 Bowcroft St.
 Los Angeles, CA 90016
**Or CALL 800-443-8615
 Nationwide.**

Predicting actual system performance is difficult and of questionable accuracy.

data system engineer.

Instead, LAN systems can be tested by measuring discrete second-order (two carrier) and discrete third-order (three carrier) distortion. These are simple tests, easy to instrument, and may give a good figure of merit of performance.

However, predicting actual system performance based on these measurements and relating that data to normal CATV specifications is difficult and of questionable accuracy. Frequency-dependent variations in the distortions are another source of error.

For broadband systems that are predominantly data, a different type of test, the noise load test, is applicable and may be more appropriate for the following reasons:

1. noise loading closely approximates characteristics of actual data traffic,
2. data channel S/N ratio is deter-

mined directly from a simple noise power ratio measurement,

3. optimum system level is easily determined,
4. optimum frequency response, or tilt, is easily determined, and
5. instrumentation is less costly than that for CATV multi-carrier tests.

Noise load testing

Noise loading is a technique commonly used for measuring nonlinear distortion of broadband communication systems. Within the Bell System, noise loading is routinely used to verify performance of baseband multiplex and microwave radio systems. Likewise, CCIR and CCITT recommendations specify noise load tests for multiplexed telephony radio relay and cable

TABLE 2

Forward 150 to 450 MHz

Cascade	12 Trunk Amp, 1 Bridger
Channel Loading	50
Trunk Output	33 dBmV, 2 dB Tilt
Bridger Output	46 dBmV, 4 dB Tilt
Carrier/Noise	50.2 dB
CTB	-55.6 dB
Crossmod	-57.7 dB
2nd Order	-67.6 dB

Reverse 5 to 112 MHz

Cascade	12 Trunk Amp
Total Amplifiers	128
Trunk Input	17 dBmV
Operational Gain	22 dB
Carrier/Noise	46.2 dB
CTB	-63.4 dB
Crossmod	-65.4 dB
2nd Order	-72.2 dB

Reliability and LRC...



Noise at the notch frequency is the sum of intermodulation noise and amplifier noise (thermal noise).

systems.^{3,4}

Noise loading consists of applying a band of Gaussian noise to the system with total noise power equal to that of the signal it replaces. The noise bandwidth is set by low-pass and high-pass filters to equal the total bandwidth of the multiplexed system. Such a test signal has properties very similar to those of multiplexed communication channels.

Likewise, the broadband noise spectrum also approximates the loading of CW carriers used for CATV, CTB and CSO tests when the number of carriers is large. If the system operates with some frequency-response tilt the noise source can be equalized to give the desired shape.

The output of the band-limited noise source is connected to notch filters to remove noise at selected channel frequencies. The noise thus filtered is fed to the system under test. When noise is loaded, nonlinearity in the system

produces intermodulation noise. At notch frequencies, where ideally no noise was injected, noise contributed by the distribution system will appear.

However, instead of measuring this absolute noise level, a noise power ratio (NPR) measurement is made. This is simply the ratio of noise power in a small bandwidth with the notch removed and then inserted.

Noise at the notch frequency is the sum of intermodulation noise and amplifier noise (thermal noise). These two components can be separated easily by disabling the noise source and noting the thermal noise.

Furthermore, one can determine whether the intermodulation noise is predominantly second order or third order by noting how the intermodulation noise varies with noise load power. In practice, the input power is changed and the level that results in maximum NPR is found. That input level is the optimum system level for which data

S/N ratio is maximized.

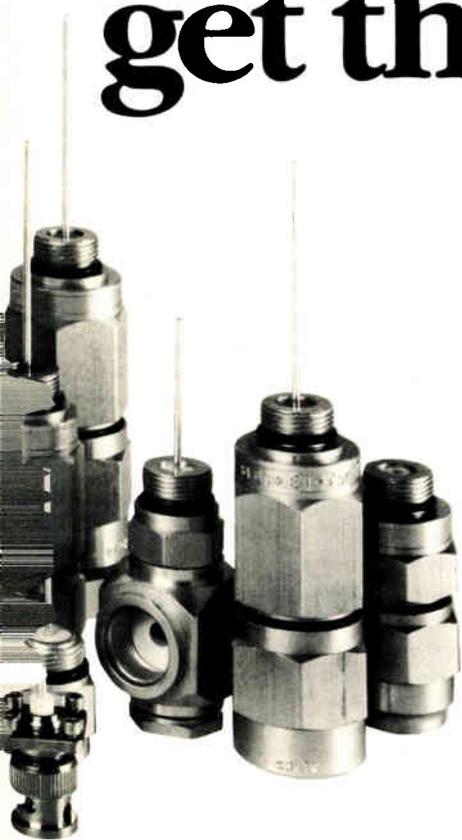
Measured data

This section summarizes results of distortion measurements on a mid-split cascade consisting of 12 trunk stations with 5 to 112 MHz and 150 to 450 MHz push-pull amplifiers. These were standard CATV stations operating at normal loading and levels.

Output levels and specifications are summarized below. The upstream C/N ratio was calculated assuming 128 trunk stations in the total tree-and-branch system. Specified performance of this system is more than adequate for well designed conventional LAN systems. There is sufficient margin to allow for expected changes in path loss and operating levels.

The highest crossmodulation ratio from 150 to 450 MHz was -58.8 dB. This is quite acceptable in the CATV industry. Even so, it can be seen that

get the connection?



Connect with LRC and you'll connect with our long-standing reputation for outstanding workmanship and engineering built into a full line of coax cable connectors.

LRC's color-coded "F" connectors eliminate the confusion of cable and connector interfaces. BNC connectors in solderless crimp, twist-on and crimp-on versions make installation easy. And our hardline "K" series delivers a number of innovative features, like LRC's patented seizing mechanism, to ensure reliability.

So no matter what kind of coax cable connector you need, when you need reliability...

Get the LRC Connection!

AUGAT LRC

A part of the growing Augat Communications Group

901 South Avenue
Post Office Box 111
Horseheads, NY 14845
(607)-739-3844
TELEX: 5101-011-251
FAX: 607-739-0106

New LAN OTDR maps fiber optic cable routing

The TD-9960 high resolution OTDR is available with disk-drive mass data storage for easier cable system documentation and trouble-shooting



Laser Precision's new high resolution optical time domain reflectometer for LAN applications offers a wide range of features and capabilities. The mass data storage option enables you to store the test trace of the total length of each fiber optic cable link on convenient floppy disks. Upon retrieval of a trace, you can obtain readout of dB loss and location at any point along the trace, such as at a splice or connector. You can also expand any point of interest along the trace for close analysis. This can be done on the TD-9960's CRT, or on an IBM type personal computer with the TD-958 OTDR emulation software to provide an easy method for maintaining and trouble-shooting the cable system. The full ASCII keyboard enables you to add notes, such as date, location, and code, as well as retrieve any trace on the floppy disk. This convenient method for mapping the routing of the cable system also makes it easier and faster to pinpoint any location of a cable problem.

The superior capabilities of Laser Precision's LAN OTDR are to the real benefit of the user. It has the capability to zoom in on any area along the total length of the trace, without having to rescan and reaverage the data. The TD-9960 eliminates the time consuming and irritating requirement of having to constantly rescan. During splicing, only a single marker is required to establish the splicing location on the TD-9960's CRT. This position is maintained, going from fiber to fiber, during sequential splicing. No reprogramming required. The TD-9960's real-time display with continuous dB readout makes it easy to optimize the fiber core alignment prior to splicing.

The TD-9960 features plug-in modules for 850 and 1300nm, $\pm 0.01\%$ base accuracy, 0.01dB resolution, 20dB backscatter range, 10cm resolution, short 3 meter dead zone which is compensated by the pigtail, 40 kilometer distance range, real-time display, dual cursors, built-in digital X-Y plotter, and available IEEE-488 or RS-232 interface, as well as the TD-959 mass data storage option.

For more information, contact LASER PRECISION CORPORATION, 1231 Hart St., Utica, NY 13502, or call (315) 797-4449, or telex: 646803

Reader Service Number 46

The discrete triple beat is greater than the composite triple beat at the low channel and less at the high channel.

crossmodulation is an insignificant factor in LAN systems. By convention, crossmodulation is measured with all other carriers 100 percent synchronously modulated, and thus the contribution for each interfering carrier adds on a voltage basis.

In an operating system modulation is uncorrelated between channels and interference will add on a power basis. In this example there were 50 carriers (49 interfering carriers) and for voltage addition crossmodulation would be 33.8 dB above a single interferer. For power addition, the increase would be 16.9 dB. Not all carriers contribute equally, but one would expect an improvement with uncorrelated modulation approaching 16 dB.

CTB is the major source of nonlinear distortion in CATV and similar LAN amplifiers. A plot of CTB measured on the 12 amplifier cascade is given in Figure 1.

As shown, CTB is higher at the high end of the band due to frequency-dependent transistor nonlinearities causing high frequency beats to be more significant. In this case, triple beats are all of the form A+B-C or 2A-B; all other components fall above 450 MHz. Also shown is some discrete triple-beat data. Carrier frequencies were chosen so as to produce beats at the low, mid, and high channels. Specifically, 229.25, 301.25, 367.25 MHz were selected to produce beats at 163.25, 295.25, and 439.25 MHz.

As shown in Figure 1 there is ± 5 dB difference in discrete triple-beat and CTB data. In a simple analysis, CTB power is proportional to the number of beats and the CTB ratio decreases 2 dB per 2 dB increase in signal level. In this case one would expect CTB to be approximately 4 to 5 dB greater than the discrete triple beat. (There are 645, 867, and 623 beats at the low, mid, and high test channels, respectively).

Note that the discrete triple beat is greater than the composite triple beat at the low channel and less at the high channel. This unpredictability is caused in part by the frequency-response tilt affecting the level of individual beats, and, as stated earlier, channels at the high end of the band have a greater contribution to CTB. A similar test on an amplifier with flat frequency response gave a spread of 5 dB in the

discrete triple beat depending on the frequencies chosen.

A noise load test on the cascade was also performed with the set-up shown in Figure 2. A commercial noise source was used to generate a spectrum with the same shape and total power as that of the multi-carrier generator used for the conventional CATV tests. A standard channel-8 trap (183.5 MHz) was used to notch the input spectrum. The

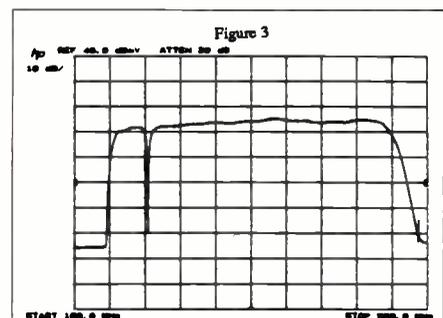


Figure 3
Noise load spectrum notch at 183.5 MHz

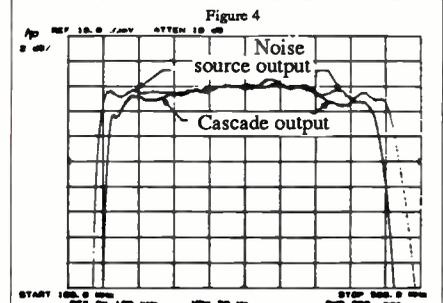
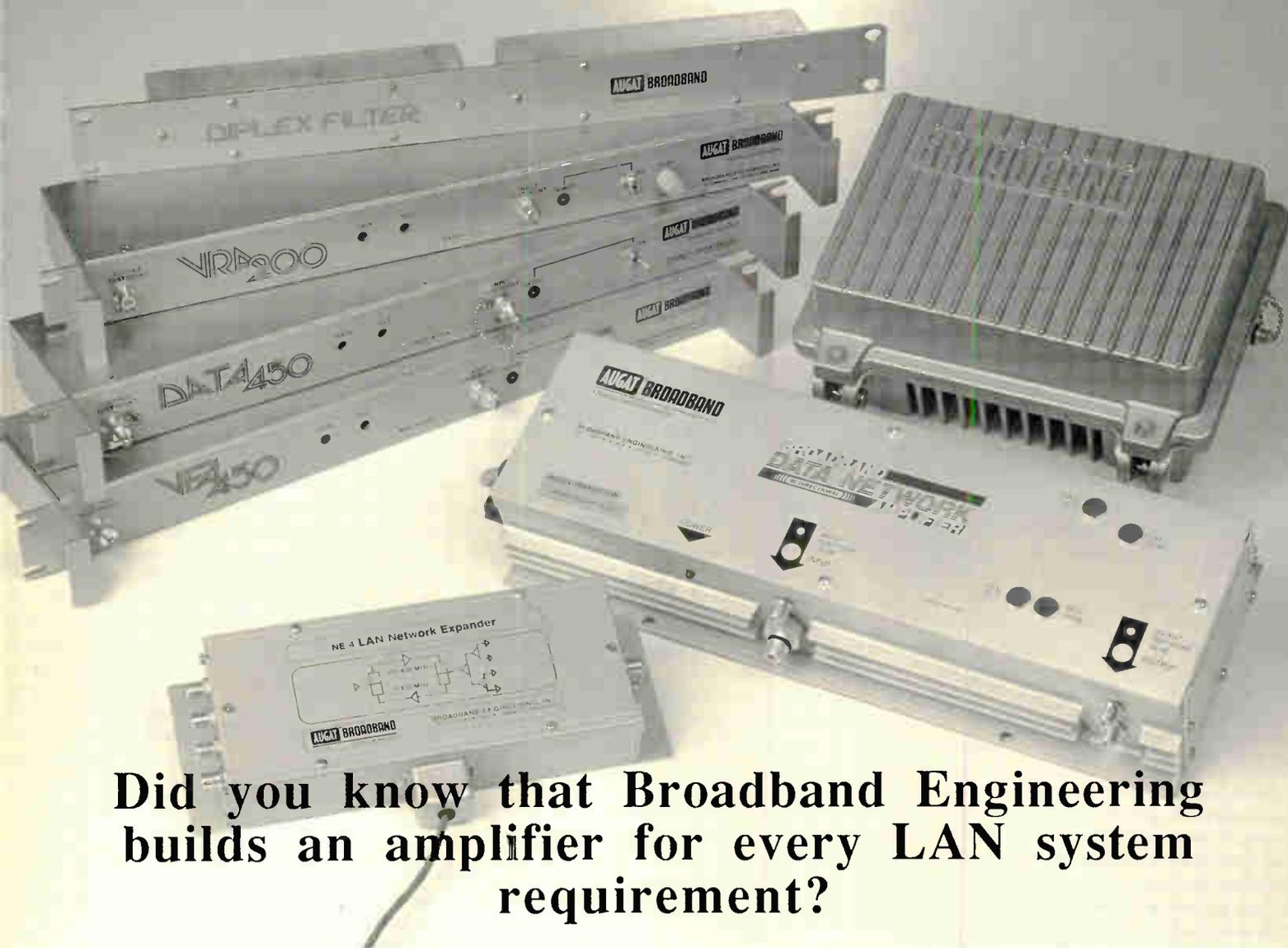


Figure 4
Noise load spectrum 2dB/Div. notch out

output spectrum is shown in Figures 3 and 4. The notch depth in Figure 3 is limited by intermodulation of the spectrum analyzer; for NPR measurements, a bandpass filter was inserted ahead of the spectrum analyzer.

Figure 4 illustrates how the noise load spectrum can be used to show the frequency response of the system under test. The noise power ratio was measured by the spectrum analyzer as the difference in level with the trap removed and installed.

At the normal operating level the NPR was 49.8 dB. This is as predicted based on C/N, CTB, and CSO data at that frequency: 51.6 dB, -65.2 dB, and -72 dB, respectively. NPR is calculated



Did you know that Broadband Engineering builds an amplifier for every LAN system requirement?

It might surprise you to learn that we are the most innovative supplier of LAN amplifiers. That comes from listening to our customers and designing amplifiers that meet their requirements.

To meet our customers needs, we build rack mounted amplifiers for single and dual cable networks, a mid-split amplifier with a weatherproof housing and a highly efficient switchmode power supply. We also have mid-and high-split indoor distribution amplifiers.

Our rack mounted amplifiers are AC or DC powered. DC powered units are built for use with communications battery powering systems.

Another unique LAN product is our network expander for expansion from a single port to four ports. The network expander allows more terminals on an existing network without adding taps.

To find out about our full line of LAN products or for LAN application assistance, give us a call.

Call toll free at 800-327-6690. In Florida, call 305-747-5000 or write us at 1311 Commerce Lane, Jupiter FL 33458.

AUGAT[®] BROADBAND
Quality and Innovation

A part of the growing Augat Communications Group

Reader Service Number 47

The 'bucket curve,' is useful in determining the optimum operating level for maximum dynamic range.

simply by adding thermal noise to CTB and CSO noise. First, since C/N is defined for noise in a 4 MHz bandwidth, it must be corrected for a 6 MHz bandwidth since carrier power is also given in a 6 MHz bandwidth.

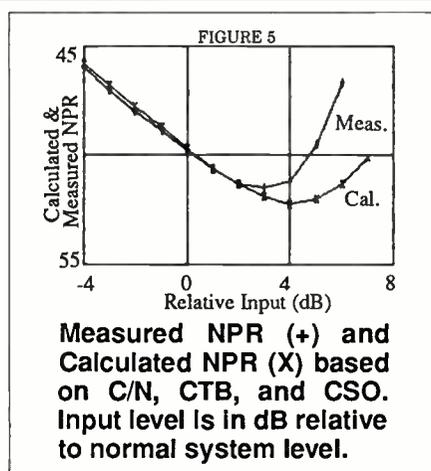
In this case the C/N ratio is 49.8 dB/6 MHz. Adding thermal noise to the CTB and CSO intermodulation figures gives a NPR of 49.7 dB.

A plot of measured and calculated NPR as a function of input level to the cascade is shown in Figure 5. This plot, referred to in the telecommunications industry as the "bucket curve," is useful in determining the optimum operating level for maximum dynamic range. For calculating NPR data it is assumed the CTB ratio degrades 2 dB per 1 dB increase in operating level and CSO degrades 1 dB per dB. The NPR curve follows the calculated curve except at higher levels where it departs significantly due to saturation of the bridge.

From this example the advantage of the noise load test can be seen: it gives

the dynamic range of the system in one measurement.

It is common practice to design broadband LAN systems to crossmo-



dulation and composite triple beat specifications according to CATV practices. In addition, discrete second order

and third order beat ratios are specified. Specification of crossmodulation is not appropriate for LAN systems. It is defined with all interfering carriers 100 percent synchronously modulated.

However, under operating conditions with carriers independently modulated, crossmodulation interference is reduced. A simple analysis shows a reduction in crossmodulation ratio of $10\log N$ where N is the number of channels.

In lieu of CTB tests for practical reasons, discrete triple beat tests are performed. A triple beat measurement is a good measure of third order distortion for the frequencies and levels of that test, but it is not sufficient to accurately predict CTB or intermodulation from a fully loaded data system, partly because of the frequency dependency of intermodulation components. ■

For a list of references, contact Linda J. Johnson, CED, 600 Grant St., Suite 600, Denver, CO, 80203, (303) 860-0111.

An Ever Expanding Range

SUPERIOR PERFORMANCE BROADBAND CABLE MODEMS

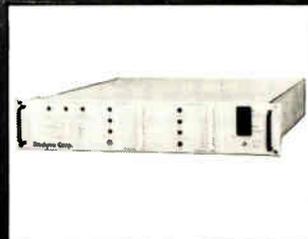
Because bit error rate counts, RADYNE's superb all-digital design offers the best equation between bit error rate performance and spectral efficiency. The CMS-1200 QPSK Cable Modem offers unmatched C/N performance, with FULL FREQUENCY AGILITY up to 300 MHz.

Diagnostic features of RADYNE's CMS-1200 include three levels of loopback. The remote loopback feature allows the entire round trip path to be tested from one end of the link with a single switch. No test equipment is required to verify operation. Also to your advantage, the necessity for frequency translators has been eliminated. RADYNE further designed the carriers to be spaced at better than .6 times the data rate, with C/N as low as 17 dB. Talk to RADYNE... then talk to the world.

Radyne Corp.

"Watch Us Grow!"

170 Wilbur Place • Bohemia, New York 11716
(516) 567-8484 • TWX 4971029



Be On The
Lookout For:
• 70/140 MHz I.F.
Converter

LANwatch

Non-interfering sweep

Wavetek Indiana is introducing its new Model 1882 Sweepless Sweep System Analyzer. It's an important product for the broadband LAN market because it allows frequency response tests while a network is operating and doesn't cause any interference to data that might be running on the network while the tests are conducted.

Other types of sweeps, such as the high level or "standard broadband" sweep, which injects sweep signals at carrier level or 6 dB above, necessarily interfere with data streams or pictures being transmitted on the network. The simultaneous sweep, another form of high level sweep, injects sweep signals about 15 dB above carrier level and causes interference for about 100 microseconds for each 6 MHz channel. The low level synchronous or "tracking" sweep causes less interference because the sweep signals are injected 10 to 30

dB below system carriers. The low level asynchronous or "slow" sweep causes about a one-second interference at each test point.

Frequency response is the variation in system gain vs. frequency from the headend to any other point on the system. The degree of response is normally measured in dB peak-to-valley. Typically, it is the trunk and distribution amplifiers and their internal equalizers that account for most of the variation: each amplifier has a unique response signature and the effect of these signatures is to distort frequency flatness across the spectrum.

The Model 1882 is connected to a test point where it scans the systems, measures selected carrier levels and stores them in memory. At each successive test point, the Model 1882 will compare the measured levels to the stored reference level. In addition to the sweep function, the Model 1882 measures signal levels, carrier-to-noise, second and third order distor-

tion, cross modulation, FM deviation, percent of hum modulation and leakage.

Test carriers for the Model 1882 can be generated by the new MCG-1 multiple carrier generator. It produces any four frequencies between 5 and 600 MHz and is desirable because data carriers frequently "pop up and disappear" before the response data can be acquired. The generator actually is manufactured by Applied Instruments and private labeled for Wavetek. For details circle reader service number 100.

Catel Telecommunications has a new catalog of video, audio and data transmission products for broadband LANs, including modulators, demodulators and processors, wideband FM point-to-point links, frequency translators, fiber optic modems, 23 GHz microwave systems and infrared T-1 point-to-point links. For details circle reader service number 101.

—Gary Kim

Find your customers when you're selling in the LAN market

The second annual Broadband Communications Buyer's Guide can help you. Think of it as a "Yellow Pages" for the Broadband LAN industry.

Buy Advertising in the ...

Broadband Communications Buyer's Guide

(303) 860-0111

600 Grant Street, Suite 600, Denver, CO 80203. (303) 860-0111

Implementing audio systems...

The decision to add new audio services to a cable system is often complicated by confusion about the function of audio processing equipment. Once it is realized that adding audio services to a system can increase revenue, the incentive exists to learn the functions of new equipment.

Deciding on the type of equipment necessary to best add specific audio services requires careful investigation of equipment function, as well as a good

... and understanding the necessary processing equipment

this article is to provide enough information for a system engineer to choose equipment with maximum versatility and performance at a reasonable cost.

All baseband audio signals occupy

RF signals simultaneously. The process that enables simultaneous transmission of various signals on the same transmission medium is called multiplex.

More specifically, the type of multiplex scheme used in cable systems is frequency division multiplex. FDM describes the process whereby a bandwidth, capable of accommodating all the signals, is split up into frequency slots or channels. Then, each baseband signal is converted to appear in a different frequency slot (see Figure 2).

Modulation

The conversion process which translates the audio baseband signal to its multiplexed counterpart is called "modulation." The two most common types of modulation are amplitude modulation and frequency modulation.

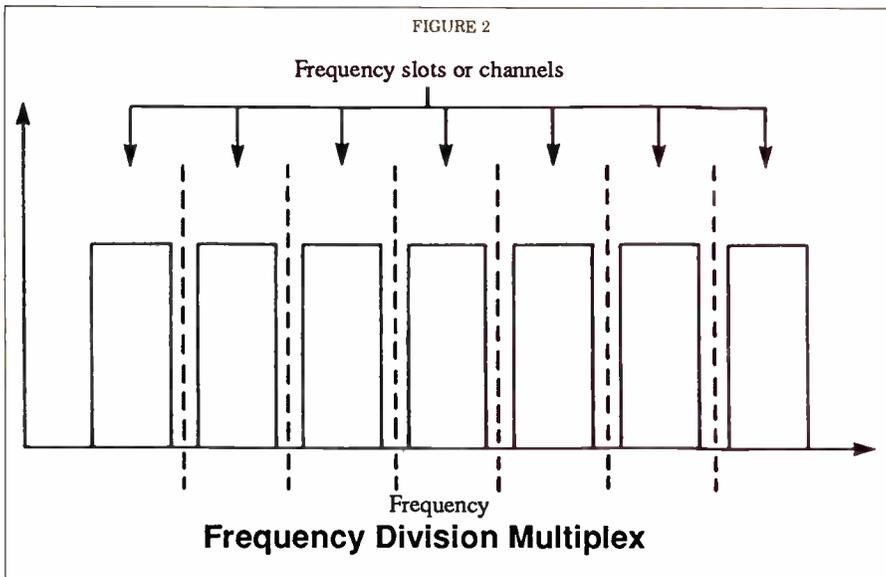
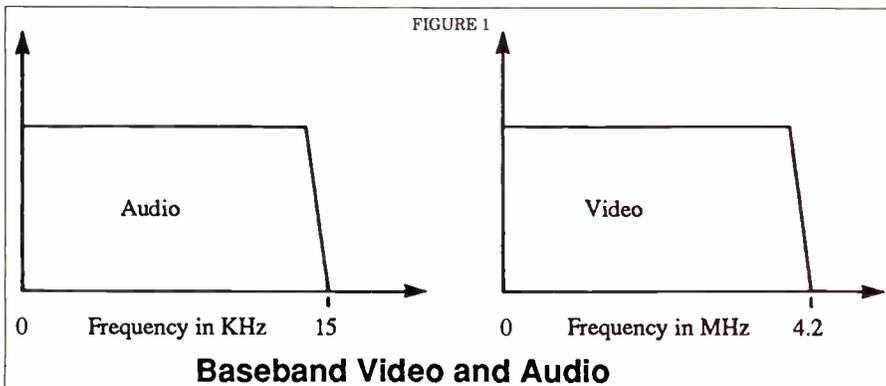
In AM, the signal information is contained in the changing amplitude of the carrier. The RF carrier is the higher frequency signal shown within the modulation envelope in Figure 3.

In AM, the carrier frequency never changes, but the amplitude varies in accordance with the modulating audio or video signal. The opposite is true in FM. The amplitude of the FM signal remains constant, but the frequency of the carrier varies in proportion to the amplitude of the modulating signal.

In FM, the amount that the carrier frequency varies from its unmodulated value is called the deviation and is directly proportional to the amplitude of the modulating signal. Figure 4 illustrates the relationship between the carrier deviation and the modulating signal amplitude.

In FM radio broadcast, the deviation is ± 75 kHz @ 100 percent modulation (the maximum deviation allowed in a specific system). The carrier frequencies for FM radio are between 88.1 MHz and 107.9 MHz with 200 kHz minimum channel spacing; 400 kHz minimum channel spacing is presently used in FM broadcast. All FM radio carrier frequencies are spaced at odd number decimal increments. For example, 88.1 MHz, 88.3 MHz and 88.5 MHz are typical station allocations.

Adding simulcast audio services in the FM band to an existing system is simple and inexpensive. This is espe-



understanding of system operation. Only when a system engineer knows how audio is processed in each unit and how multiple channel reception is achieved, can he successfully implement new audio services. The aim of

the frequency range of 0 to 14 kHz, and all baseband video signals occupy the frequency range of 0 to 4.2 MHz. All FM radio signals begin as baseband audio signals and all TV signals begin as baseband video and corresponding baseband audio signals as shown in Figure 1.

Cable systems carry many different

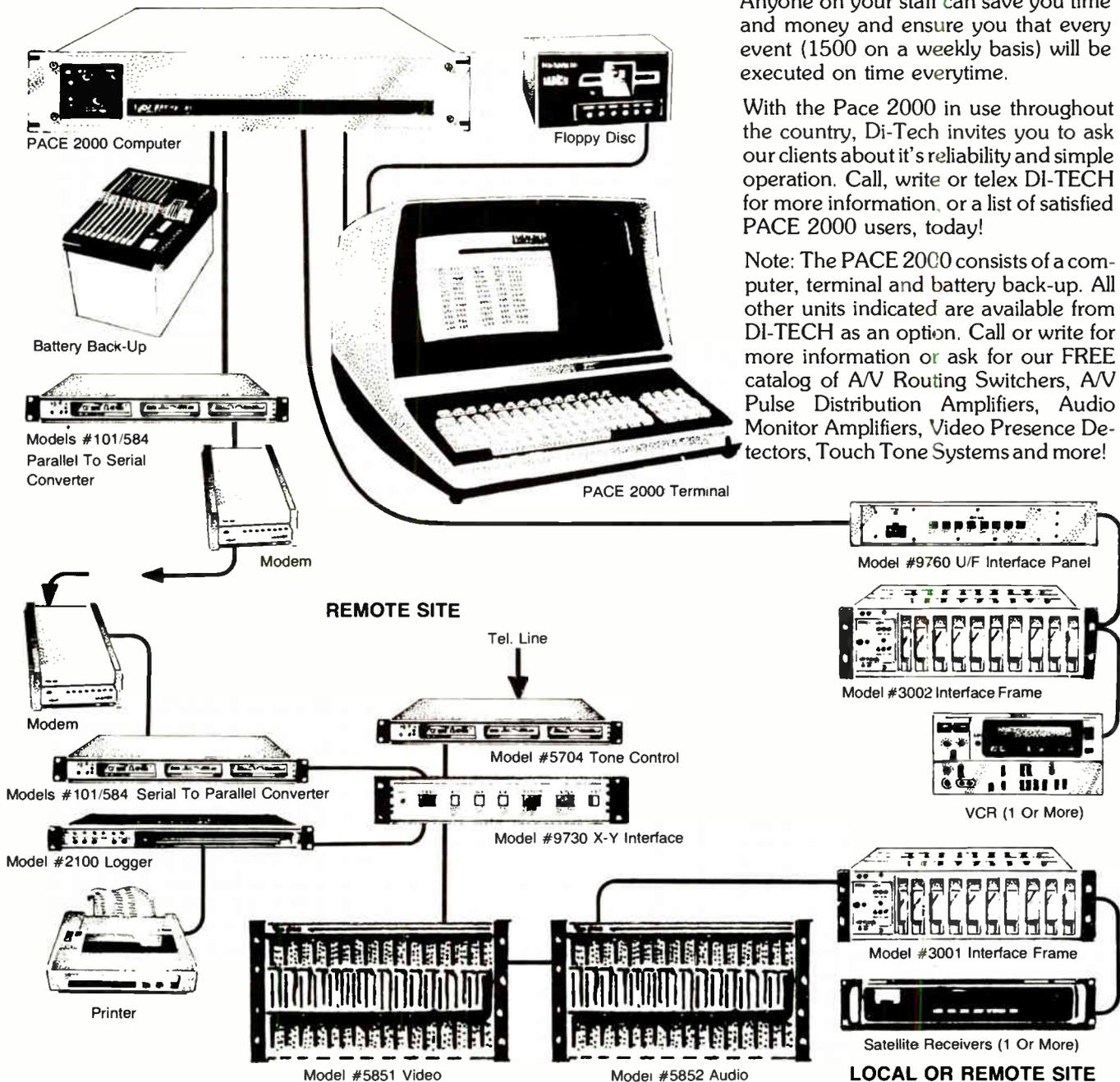
By Gary Rogalski,
Nexus Engineering Corp.

Let Di-Tech's Pace 2000 Simplify Your Local Origination, Remote And Multiple Headend Requirements With Real Time Automatic Control

Di-Tech's Pace 2000 is everything you want in an affordable weekly controller. Anyone on your staff can save you time and money and ensure you that every event (1500 on a weekly basis) will be executed on time everytime.

With the Pace 2000 in use throughout the country, Di-Tech invites you to ask our clients about it's reliability and simple operation. Call, write or telex DI-TECH for more information, or a list of satisfied PACE 2000 users, today!

Note: The PACE 2000 consists of a computer, terminal and battery back-up. All other units indicated are available from DI-TECH as an option. Call or write for more information or ask for our FREE catalog of A/V Routing Switchers, A/V Pulse Distribution Amplifiers, Audio Monitor Amplifiers, Video Presence Detectors, Touch Tone Systems and more!

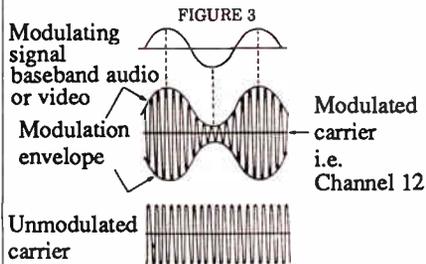


di di-tech

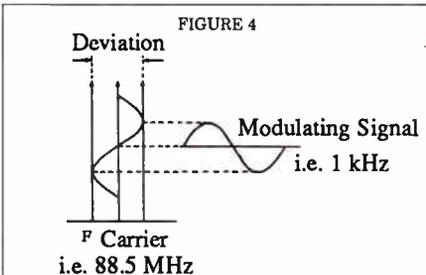
48 JEFYRN BOULEVARD DEER PARK, N.Y. 11729

TEL. #(516) 667-6300 TELEX #971806

In addition to a baseband to RF modulator, a stereo generator is required to generate an FM stereo signal.



Amplitude Modulated Signal



Frequency Modulated Signal

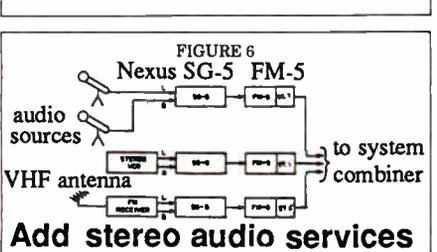
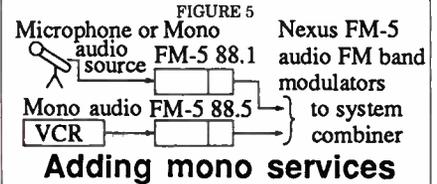
cially true when you take advantage of the high performance, low cost technology now available.

Mono services are easily added to an existing system. Figure 5 illustrates a typical application where two independent mono services are first modulated then combined on a cable system.

Stereo generation

Virtually all FM signals are now broadcast in stereo. It is a rare occurrence to have the stereo light not come on when tuning in an FM station.

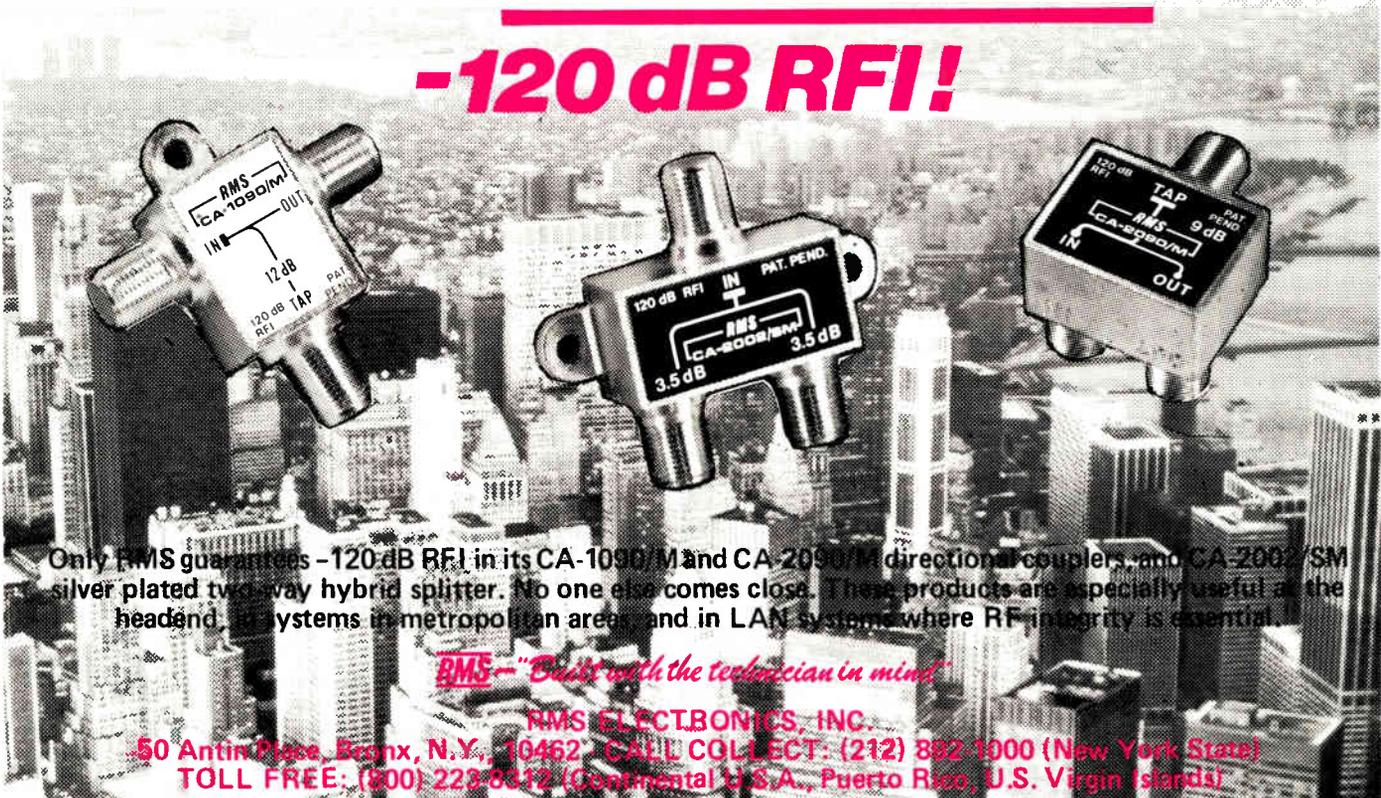
In addition to a baseband to FM modulator, a stereo generator is required to generate an FM stereo signal. The stereo generator has two inputs, each of which accepts 1/2 of the stereo signal (i.e., left or right), and a composite stereo output. Composite refers to the multiplexed combination of all the signal components provided at the stereo generator output. The composite stereo signal is then connected directly



to the audio input of the frequency modulator, as shown in Figure 6.

Just as FDM is used to distribute many cable signals simultaneously without interference, it is also used to combine the baseband audio signals so they can be frequency modulated onto a single carrier without interference.

RMS GUARANTEES
-120 dB RFI!



Only RMS guarantees -120 dB RFI in its CA-1050/M and CA-2050/M directional couplers, and CA-2007/SM silver plated two-way hybrid splitter. No one else comes close. These products are especially useful at the headend of systems in metropolitan areas, and in LAN systems where RF integrity is essential.

RMS - "Built with the technician in mind"

RMS ELECTRONICS, INC.
50 Antin Place, Bronx, N.Y., 10462 CALL COLLECT: (212) 882-1000 (New York State)
TOLL FREE: (800) 223-8312 (Continental U.S.A., Puerto Rico, U.S. Virgin Islands)

The first step in the generation of the composite stereo signal is the matrixing of the left and right audio signals.

The first step in the generation of the composite stereo signal is the matrixing of the left and right audio signals. Matrixing refers to the generation of sum and difference signals, (L + R) and (L - R), from the original left and right signals, as shown in Figure 7. The sum channel is simply mono

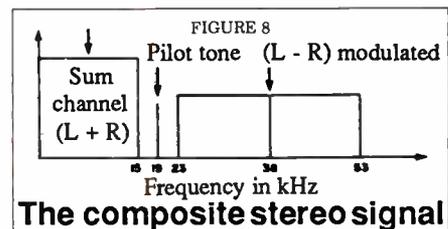
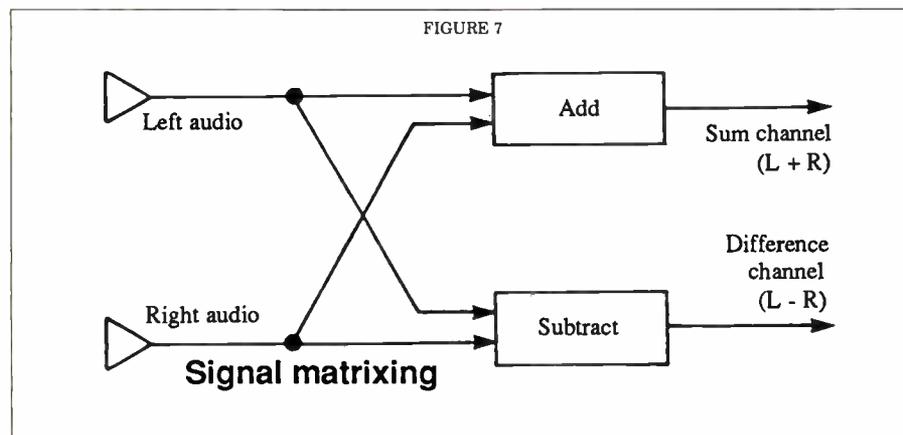
audio and occupies the bandwidth of 0 to 15 kHz.

The difference channel is amplitude modulated onto an internally generated 38 kHz subcarrier. The baseband difference channel also occupies the bandwidth from 0 to 15 kHz, but after amplitude modulation onto the 38 kHz

subcarrier, occupies the bandwidth from 23 to 53 kHz.

A pilot tone at exactly one half the subcarrier frequency (19 kHz) and in phase with the 38 kHz carrier is combined with the sum channel and the amplitude modulated difference channel to form the composite stereo signal as shown in Figure 8.

The entire composite baseband stereo signal is then frequency modulated onto the FM carrier allowing for stereo FM reception. The presence of a 19 kHz pilot tone tells the FM receiver that the signal being demodulated is in stereo.



5 Star General

MULTI-BEAM FEEDS

- Maximize your programming capability, by receiving Galaxy 1, Satcom III R, Telstar 303, Westar 5 and Spacenet with the use of one dish.
- Add to system revenues, through tier expansion.
- Eliminate additional land acquisition and the installation costs of multiple dishes, while increasing your earth station investment.

MULTI-DISH? OR MULTI-FEED?

The Rainbow Multi-Beam Feed allows you up to 5 prime focus feeds, depending on the size of your antenna.

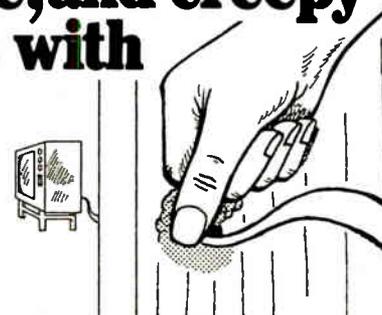
For a complete list of antennas that can be retrofitted call or write:

RAINBOW SATELLITE COMMUNICATIONS

Attn: Brian Wilkes • 1015 Thomas Road
P.O. Box 395 Leesburg, FL 32748 • (904) 326-8030

Reader Service Number 51

Keep out water, moisture, and creepy crawlies with GS/9.57



GS/9.57 Thum Seal closes openings around cables, pipes, conduits, and feed-through orifices used in cable TV installations.



- Use above or below ground • Moldable
- Permanently plastic • Non-corrosive
- Excellent cold weather properties

Call or write for complete information.

GS

GENERAL SEALANTS, INC.
P.O. Box 3855 • City of Industry, CA 91744
Toll free: 800-762-1144 • In Calif. (818) 961-0211
Telex: 6972870-GS

Reader Service Number 52
Communications Engineering and Design October 1987 107

If subcarrier services are desired, then subcarrier demodulators are used in the system.

The pilot tone is doubled in frequency and then used to demodulate the AM signal centered at 38 kHz.

Stereo sources

The incredible variety of audio programming material available today is one reason why audio services are

enjoying their current popularity on cable systems. The largest selection of audio signals is available by satellite.

Audio services transmitted by satellite are FM signals called subcarriers. The subcarriers are multiplexed in frequency between approximately 5 and 8 MHz and then combined with the baseband video signal to form the com-

posite satellite signal, (see Figure 9).

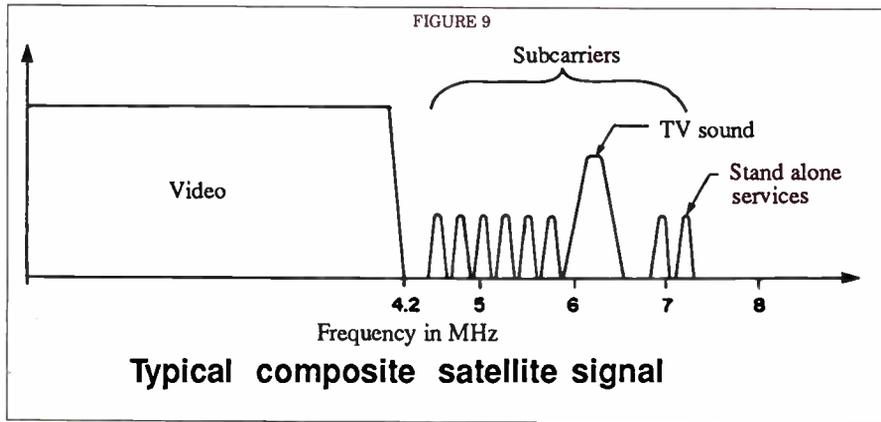
Just as the composite stereo signal contained the information from two separate signals (i.e., left and right audio) combined without interference and modulated onto a single carrier, the composite satellite signal contains baseband video information along with information from many individual audio signals, combined without interference. The entire composite satellite signal frequency modulates a carrier used in satellite up-link conversion.

Both television sound signals and stand-alone services are transmitted by satellite. The audio for stand-alone subcarrier services is not related to the video on the composite satellite signal and can cover the entire range of listening preference.

If subcarrier services are desired, then subcarrier demodulators are used in the system.

Figure 9 shows a composite satellite signal with both a television sound subcarrier and stand-alone subcarriers.

Analog stereo subcarriers on satellite are generally in one of three formats. The first is called matrix stereo and just as in the FM radio signal, the left and right signals are matrixed together (L+R) and (L-R)



STOP *AT LAST!* START

Audio Level Master

3 Stereo Channels Per Mainframe!

THE ALM672

SCREWING AROUND WITH AUDIO LEVELS **CONTROLLING VOLUME AUTOMATICALLY!**

THE ULTIMATE AUDIO LEVEL CONTROLLER

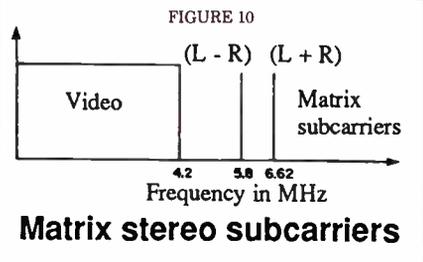
- ± 15dB input level variations stabilized to ± 0.2dB
- Stereo or monaural channel control
- Dual band control system for sound purity
- Gating built-in to prevent noise pumping
- Balanced and floating input and output
- Select 0.0, +4, or +8 dBm output
- 3 stereo channels per mainframe!

FM SYSTEMS, INC.

(714) 979-3355

3877 S. Main St.
Santa Ana, CA 92707

800-235-6960



signals are each frequency modulated onto separate subcarriers.

Matrix subcarriers generally deviate + 100 kHz or more. Figure 10 illustrates a satellite baseband with matrix subcarriers.

The second and third type of subcarriers are both discrete. Discrete stereo describes the process where the left and right channels are modulated directly onto separate subcarriers. The two types of discrete subcarriers differ in their amplitude and deviation.

Higher level discrete subcarriers will typically deviate + 100 kHz or more. Low level discrete subcarriers will

With the recent introduction of stereo TV, an alternative to FM simulcasting is now available.

deviate + 50 kHz or less. Regardless of format, subcarriers with a deviation of + 100 kHz or greater are usually called wideband and subcarriers with a deviation of + 50 kHz or less are called narrowband. If uncertain about the format of a specific subcarrier and the type of demodulator required, consult the manufacturer.

The number and type of subcarrier transmitted on a satellite transponder can vary greatly. Transponders that carry many subcarriers will use low level narrowband subcarriers to conserve power. The lower level and narrower deviation will cause the satellite carrier to deviate less and use less power.

Reducing the level and deviation of a subcarrier does allow for more subcarriers per transponder, but unfortunately, this also reduces the demodulated audio signal to noise ratio. Special audio processing called companding is required to improve the SNR in these cases. Different types of companding is used.

Narrowband subcarrier equipment must be capable of properly processing companded subcarriers.

Receiving the signals

Fortunately, two types of subcarrier demodulators, also called stereo decoders, are able to handle most subcarriers. A high quality wideband subcarrier demodulator is able to demodulate both wideband matrix and discrete subcarriers. A good quality narrowband subcarrier demodulator is able to demodulate both companded and non-companded discrete narrowband subcarriers.

All that is now required for a complete system is a satellite receiver to provide the subcarriers for the subcarrier demodulators or a stereo satellite receiver to provide direct audio inputs to the stereo generator. Stereo satellite receivers will probably not

include the circuitry necessary to properly process narrowband subcarriers.

Stereo TV subcarriers may be in mono, stereo or both. Simultaneous broadcast of stereo television sound on the FM band and mono sound through the television sound carrier is called simulcast. A subcarrier containing mono television sound is always transmitted when stereo television sound is not available. The mono subcarrier is transmitted at either 6.2 MHz or 6.8 MHz. The single subcarrier demodulator in mono satellite receivers would be tuned to this subcarrier. Figure 11a shows a typical simulcast system.

For maximum versatility, a subcarrier demodulator with a separate sub-

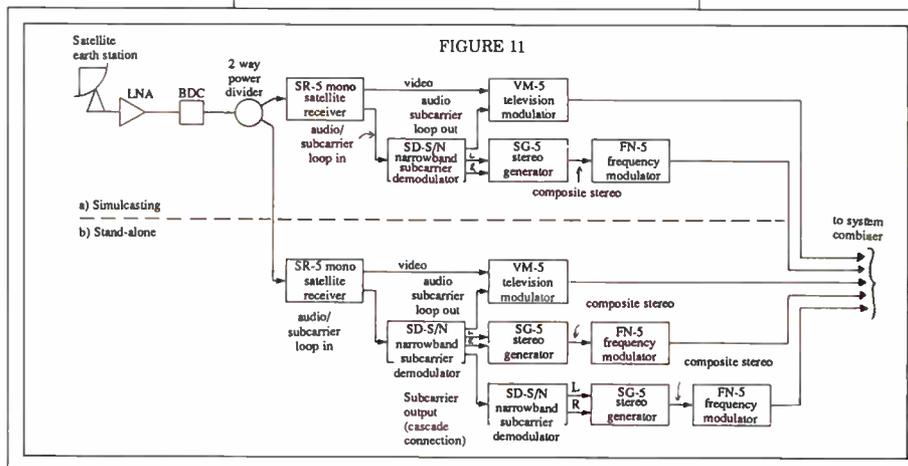
signal is applied to the subcarrier demodulator. The video source signal for the television modulator or descrambler is obtained from the loop-through output.

With the recent introduction of stereo TV, an alternative to FM simulcasting is now available.

Just as an FM stereo generator is used to input stereo audio to the FM modulator in FM stereo, a TV stereo generator is used with the TV modulator in stereo TV.

The baseband TV stereo signal is different from the baseband FM stereo signal in several ways. First, the pilot tone frequency is offset from 19 kHz to 15.734 kHz (the horizontal sync rate in a video signal).

Second, the dbx noise reduction circuitry for MTS (multichannel TV sound) is used to process the (L-R) signal. A secondary audio program channel for multilingual programming as well as a professional channel for voice or data is also included in the BTSC baseband signal. The video



carrier output or loop-through should be used. The subcarrier output connection will allow several subcarrier demodulators to be connected to the same subcarrier source (i.e., satellite receiver) in cases where many pairs of subcarrier signals are available on the same satellite baseband. This is known as cascading. Figure 11b illustrates the subcarrier loop connection.

With both simulcasting and stand-alone services, the satellite receiver provides a mono signal which is applied to the audio input of the TV modulator. In systems where the mono audio is combined with the subcarriers at the satellite receiver output, as shown in Figure 11, the subcarrier demodulator will provide a direct loop-through connection so that the audio may be applied to the audio input of a television modulator. The loop through connection is also essential in systems where the entire satellite baseband

signal is looped through the stereo generator so that the 15.734 kHz pilot tone can be obtained.

Scrambled satellite signals do not complicate the implementation of stereo television services. Stereo audio is provided by the descrambler which essentially takes the place of the subcarrier demodulator or stereo satellite receiver.

The basic elements in a stereo system are the same, whether it be for TV or FM radio. A stereo signal source, stereo generator and modulator are always required. For the addition of stereo services, the use of a subcarrier demodulator, and the type, is determined once decisions are made about which specific services are to be added.

Proper understanding of how a system works, and what the capabilities and function of each device are, will allow a system designer to more easily choose the correct equipment. ■

classifieds

HELP WANTED

WE PLACE ENGINEERS, SALES, MGMT. & FINANCIAL PEOPLE

(all levels for the CATV Industry)
Nationwide Service - All Locations
America's Leading Source for a Decade
For information phone or write Mark Kornish



KEY SYSTEMS

479 Northampton Street
Kingston, PA 18704

Employer
Paid Fees (717) 283-1041

SYSTEM TECHNICIAN

For maintenance of 1,000 mile dual system in Southern Marilyn. Must have three years experience and troubleshooting in all phases of CATV system. Excellent benefits and career opportunities. Send resume or contact:

Doug Worley, System Engineer
MetroVision of Prince George's County
1107 Ritchie Road
Capitol Heights, MD 20743
(301) 499-2930

EOE

STARNET

DIRECTOR OF TECHNICAL OPERATIONS

Set-up and manage satellite uplink for new cable TV network. Supervise system equipment production and national roll-out. Five years broadcast video and uplink experience with high organizational skills required. Send resume to:

President/StarNet, Inc.
384 Technology Drive
Malvern, PA 19355

EOE

Warren & Morris, Ltd.



Since 1983

**Executive Search &
Recruitment
for the
Cable and Cellular industries**

Marcia K. Larson
(619) 481-3388
2190 Carmel Valley Road, Del Mar, CA 92014

Baker Scott & Co.

EXECUTIVE SEARCH
1259 Route 46 Parsippany, NJ 07054 201 263-3355

**Specialists in the COMMUNICATIONS
INDUSTRY**

CABLE TV/BROADCAST TELECOMMUNICATIONS
DIVISION DIVISION

POSITIONS AVAILABLE AT ALL LEVELS OF
MANAGEMENT. COAST TO COAST

Call or write in CONFIDENCE

FEE PAID

"WE DON'T TALK CABLE, WE KNOW CABLE"
PRINCIPALS DAVID ALLEN & JUDY BOUER

"Leader in the Placement of Cable Television Professionals"

Nationwide Service
**JIM YOUNG &
ASSOCIATES**

One Young Plaza
1235 Ranger Highway
Weatherford, TX 76086

(800) 433-2160
(817) 599-7623

EQUIPMENT FOR SALE/RENT

CHARACTER GENERATOR REPAIR

METRODATA-BEI
110/120 CG800/R

C.A.B. Digital Service
(516) 286-5822

FOR SALE TEST EQUIPMENT

Tektronix 1750 Waveform/Vector monitor.
Never used, with warranty. Includes rack.
Best offer. Call (312) 395-8808.

AERIAL BUCKET TRUCKS

Large selection geared for CATV
**STANDARD TRUCK &
EQUIPMENT CO.**
1155 Hill St. S.E.
Atlanta, GA 30315
Phone: 1-800-241-9357



BUCKET TRUCKS

Recruiting Advertising

For more information, call
Judy Medley at (303) 860-0111.

WANTED: SURPLUS CABLE EQUIPMENT

Jerrold, Oak, Hamlin & Scientific
Atlanta equipment.
Highest Prices Paid
Cable Equipment Brokerage Co.

(818) 709-3724

Licensed AUTOMATION TECHNIQUES INC.

Modification for commercial receivers to work with descramblers

PDC new tunable processor, demodulator, converter \$329⁰⁰

GLR 500 CH new crystal commercial satellite receiver \$329⁰⁰

1839 North 105th East Avenue • Tulsa, OK 74116 • (918) 836-2584/(918) 836-8281 (Service Center)

CHANNELCUE

Line equipment
and meter repair



LEE ENTERPRISE

623 4th STREET • P.O. BOX 590 • OESHLEER, NEBRASKA 68340
(402) 365-7520

FOR SALE

GOOD, USED MICROWAVE GEAR!
MA-12X sets of transmitters and receivers
K-01 thru K-07 and K-09
K-24 thru K-32 and K-34
K-36 thru K-39

Also (2) 6' and (2) 4" dishes with dual polarized feed horns. MUST SELL!

Tom Hickson
Heritage Communications
515/246-1440

MAILING LISTS AVAILABLE

For more information, call Judy Medley at
(303) 860-0111.

Bucket Trucks—Used

Telsta, Versa-Lift, Digger Derricks—10 in
Stock. 30 other Utility Construction Trucks.

"We Buy and Sell"

Opdyke, Inc. (Philadelphia Area)
3123 Bethlehem Pike (215) 721-4444
Hatfield, Pa. 19440

TOWER SPACE FOR RENT

Prime site covers North Jersey and Rock-
land; 500 feet+ elevation. Call or write:
Peter Psirogianes, UA Columbia Cablevi-
sion, 7 Fir Court, Oakland, NJ 07436. (201)
337-1550, ext. 205.

TEXSCAN SG-3

Used Texscan Spectragen 3 character
generators (some with keyboards) for sale.
SG-3, \$1,150.00. SG-3 with keyboard,
\$1,375.00. For information call Dave Keener
at 1-918-665-6690.

BUSINESS DIRECTORY

NETCON

A Division of C & S Construction, INC.

TURNKEY LAN SYSTEMS

Richard Piltz
Projects Coordinator
412-935-1553

5031 Oakview Dr.
Gibsonia, PA 15044

If you're not on our
**MONTHLY PARTS
MAILING LIST**
you should be!
Here's why...

Call
1-800-382-BRAD
In NY 518-382-8000
Ask For Parts Sales
CLEARLY BETTER

DRZ Bezel 18F	\$2.45
BC2002 Faceplate	.78
CRX5000 Transformer	6.50
Piggyback AC Cord	3.25

Minimum Quantity 100 Pieces



CONTRACT INSTALLERS, INC.

UHF Radio Equipped Trucks • Uniformed Installers

HOUSE INSTALLATIONS

Aerial - Underground - Pre-wire
APARTMENT INSTALLATIONS

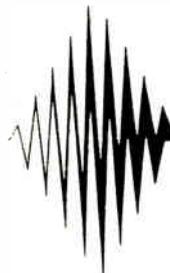
Post wire - Pre-wire - Commercial Building
Tap Audits

Install or Remove Traps and/or Converters
Drop change over for System Rebuilds

LENNY FISCHER
(414) 582-7087

P.O. Box 1564
Appleton, Wisconsin 54913-1564

SIGNAL LEVEL METER REPAIR
Prompt, Professional Service
at Reasonable Prices



JGL
ELECTRONICS, INC.

4425 BLACKSTONE DRIVE
INDIANAPOLIS, INDIANA 46237
317/783-6130

ENGLISH ENTERPRIZES

Serving the industry
since 1974



THE INSTALL
PEOPLE
ENGLISH
ENTERPRIZES

P.O. Box 6494
Orlando, Florida 32853

305-898-7134

- Aerial Installs
- Underground Installs
- Drop Transfer
- Commercial Development
- Design
- Tap Audits
- Underground and Aerial Construction

CABLE COMM. CONSTRUCTION, INC.



- Aerial & Underground
- Full Service Bench Repair
- System Sweep & Analysis

Cable Comm. Construction, Inc.
P.O. Box 1009
Hartwell, GA 30643-1009
(404) 376-5259
1-800-342-4103

Cooperation between cable and b'cast evident at SCTE technical session

A surprising number of attendees turned out for the 1987 Eastern show technical sessions, sponsored by the SCTE and SCTA. Over 100 attendees listened to the various sessions on headend maintenance, amplifier technology, test equipment, signal processing and terminal devices. Clifford Paul started the morning sessions with a brief overview of the FCC situation, noting that docket 21006 (signal leakage) is mainly "bad" news for cable, not the broadcasters. Paul stated that cable systems have to change aeronautical frequencies in 1990 even if a waiver has been granted recently. He went on to say that the Achilles heel of cable systems is the leakage problem. "Heaven forbid if an air disaster shows that a cable system is at fault because of leakage into an aeronautical frequency," Paul stated.

Richard Covell of Jerrold followed with a session on headend maintenance and upkeep. Covell touched on such areas as lightning strikes, protection, and air conditioning within a headend. Bob Loveless, with Scientific-Atlanta, explained the various amplifier technologies of push-pull, parallel hybrid, quad power and feed-forward, saying they're all basically push-pull. "We're just packaging them differently," he said.

The final Monday session, by Wavetek's Terry Bush, focused on test equipment for the cable industry. Tuesday morning sessions began with a brief explanation of the BCTE endorsement, followed by sessions on signal processing by Alex Best of Cox Cable and terminal devices given by Jim Farmer of Scientific-Atlanta.

Another sign of the growing spirit of cooperation between cable and broadcast interests was a technical seminar presented by the Rocky Mountain Chapter of the Society of Cable Television Engineers at Jones Intercable's headquarters Sept. 9. Representatives of three Denver broadcasters, six MSOs and one consumer electronics manufacturer were on hand to discuss issues that relate to both industries, including high definition TV, stereo,

education and training. Details of the proceedings will appear in a future issue of *CED*.

Speaking of the SCTE, the society is soliciting proposals for paper and workshops to be presented at the Cable-Tec Expo next June. Submissions, which should include an abstract of the proposed paper or workshop, must be sent to the SCTE no later than Nov. 15. The SCTE's address is: 669 Exton Commons, Exton, Pa. 19341. In addition, the SCTE is seeking nominations to fill vacancies on its board of directors. Call (215) 363-6888 to make a nomination.

Also, the National Cable Television Association has issued its first call for papers for the 1988 technical program portion of the national cable show. Brief outlines and summaries of any communications engineering topic of interest to the cable community must be submitted by Jan. 5, 1988. Topics will be selected in January and camera-ready manuscripts will be due six weeks later. Proposals should be sent to: Katherine Rutkowski, director, technical services, Science and Technology department, NCTA, 1724 Massachusetts Ave. NW, Washington, D.C. 20036.

Grass Valley Group has introduced a new fiber optic transmission system for distribution of video and audio signals. The Series 87 EZ-LINK system features LED and laser transmitters for distribution over distances up to eight kilometers. The system delivers 60 dB signal-to-noise and a 10 MHz frequency response is compatible with standard NTSC baseband video. For details circle Reader Service number 104.

West Haven, Conn.-based **EOTec Corp.** has introduced a fiber transmission system for 4 to 20 mA or 0 to 10V DC level analog signals. The link allows replacement of twisted pair cable to increase noise immunity over a distance of 10,000 feet. The link is priced at \$900. For details circle Reader Service number 105.

Meanwhile, **Jensen Tools** is offering a tool kit for fiber optic work. Designed for field work, the tool kit is

designed for use with Amphenol 905 and 906 type connectors or other compatible SMA styles and for terminating a variety of single and bundled optical fiber cable. Tools and supplies for cleaving, stripping, polishing, buffing, crimping and inspection are included. For details circle Reader Service number 106.

And Reliable Electric/Utility Products announced the introduction of the BEFO fiber optic distribution enclosure. The enclosure combines interconnect and distribution capabilities and will accept most standard connector configurations. They are designed for LAN/inter-office pigtail splicing, termination and distribution. For details circle Reader Service number 107.

Telescript Industries' newest optical line-of-sight laser transmission link, the L-5000, made its debut. The laser link is capable of transmitting 40 television channels up to one-half mile. It features a hermetically sealed and RF shielded housing, precision optics, high resolution tracking and weighs under 40 pounds. For details circle Reader Service number 108.

A new outdoor microwave feedforward repeater is now being offered by **Hughes Aircraft Co.**'s microwave products division. The Model FFR-123 repeater is designed to permit cable operators to extend existing signal paths and implement new paths where line-of-sight is obstructed. It amplifies signals received from the primary microwave transmitter and retransmits them to new or secondary hub sites. For details circle Reader Service number 109.

A new private microwave radio from **NEC America** is now available. The 6G45MB system operates in the 6 GHz frequency band and using 10 MHz of bandwidth, has the capacity for 672 channels. For details circle Reader Service number 110.

PicoMacom has announced its latest product, the Model VDS-1 multiple video distribution system. The VDS-1 combines RF signals from an off-air antenna with those of two other sources into one signal. The combined signal is then amplified and distributed via two outputs through the home. It allows the simultaneous viewing and recording of programs from the three sources to multiple locations. For details circle

An air-spaced dielectric coaxial cable for plenum installation is now being produced by Trilogy Communications.

Reader Service number 111.

An air-spaced dielectric coaxial cable for plenum installation is now being produced by **Trilogy Communications**. With an outer conductor of uninsulated aluminum, the cable is installed bare, with no need to thread through conduits. The new plenum is both UL and NEC classified. The cable is available through Anixter. For details circle Reader Service number 112.

ISS Engineering's new Series II GL2610 agile modulator for medium to large cable systems is now available. Added features include both positive and negative 12.5 kHz, 25 kHz and zero offsets for all channels. Pre-emphasis is switchable. For details circle Reader Service number 113.

FM Systems debuted the ALM672 stereo audio level master to complement its ADM-1 audio deviation meter. The master assures that audio levels remain constant from program to program or during ad insertion. No output adjustments are needed (after the original output level is selected) and LED indicators show the degree of compression control being applied and the degree of stereo balance. For details circle Reader Service number 114.

An integrated receiver/descrambler is available from **Panasonic**. The CRD-4400 has a built-in VideoCipher II, internal programmable antenna positioner with on-screen graphics and proprietary ambience audio circuitry. The unit also features a built-in programmable actuator controller with 30 satellite memory capacity, C- and Ku-band capability, parental lockout and favorite memory. For details circle Reader Service number 115.

Shellie Rosser has joined **Anixter Communications** as vice president of business development. Rosser comes to Anixter from Pioneer Communications, where she was director of corporate accounts. She will be responsible for developing new business opportunities in the converter marketplace.

Rich Alfonso has been reassigned as vice president of research and development for CMS. In his new position, Alfonso will be the liaison between CMS and the CATV community in addition to facilitating product research. CMS also named **Bob Scott** manager of development and **Ella Johnsen** eastern regional director of

client support.

AM Communications has named **Thomas Kilmartin** vice president of its field services division. He comes to AM from Contel-Executone.

Richard Clevenger has been named

vice president of engineering for **Paragon Communications**. He will be responsible for senior management of all engineering aspects at Paragon, a joint venture between ATC and Houston Industries. He was most recently

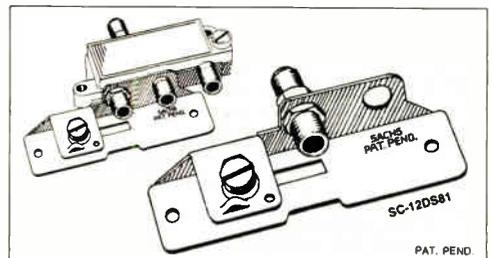
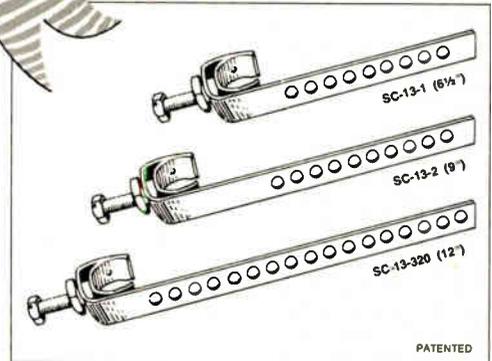


Our ground crew is now UL LISTED

100% GROUND SACHS HAS THE ONLY ALTERNATIVE

Now you can be sure of your grounding. The UL listing reaffirms our quality. Here are our special unique features:

- SC-13** *Series Ground Strap:*
- Easy one tool installation
 - Positive contact (all copper)
 - Preformed to fit any size pipe
 - One piece construction.
 - No welding
- SC-12** *Ground Block/Bracket:*
- Exceeds 280 hrs anti-corrosion Salt test per ASTM B117
 - Accepts single or dual F81 fittings.
 - Easy and positive attachment of grounding wire.
 - Additional subscriber lines can be accommodated using splitters without removing block/bracket
 - Accepts 2 way, 3-way, 4-way 5-way, etc... splitters.
 - Very low contact resistance; less than 1 ohm



FREE SAMPLES SENT WITH EVERY INQUIRY



SACHS Communications Inc.,
30 West Service Road, Champlain, N.Y. 12919 9703
In Canada: 745 Avoca Avenue, Dorval, Qué. H9P 1G4

FOR MORE INFORMATION
CALL TOLL FREE
800-361-3685
In Canada: Call (514) 636-6560

The Pennsylvania Cable Pioneers honored Elmer Metz, Ken Brubaker, Hank Lockard and Vic Nicholson recently.

employed by Cox Cable Communications.

Chris Sophinos has been appointed chief operating officer of Midwest-CATV, a division of Midwest Corp. He comes from Jerrold, where he was sales director.

Phyllis Thompson has been promoted to national sales manager of **CaLan Inc.** She has been with CaLan since the beginning of the year. Prior to that she was with Wavetek.

Thomas Moore has been promoted to the position of Western regional sales manager for **Cable TV Supply Co.** He had been the outside sales rep for California, Arizona and Nevada. His territory now grows to 11 states.

Mike Lovell has been elevated to general manager of **Falcon Cable Systems'** central Oregon region. He was most recently chief technician at the company's Malibu, Calif., operation. Also, Falcon named **Dennis Putnam** general manager of the Crescent City, Calif., system, a new acquisi-

tion. He was formerly technical supervisor of Falcon's Tulare, Calif., region.

The **Pennsylvania Cable Pioneers** honored **Elmer Metz, Ken Brubaker, Hank Lockard** and **Vic Nicholson** during a recent banquet. Metz, president of Metz and Jarvis Associates when he died in 1979, began his career with Jerrold in 1953 and was a senior member of the SCTE. Brubaker was an early cable TV engineer; Lockard began his career as the only cable technician for Williamsport Cable in 1952; and Nicholson started designing systems for Jerrold in 1949.

Monroe Electronics has named nine firms as its exclusive territorial representatives. They are as follows: Cable Technology Associates, covering New York, northern New Jersey, Massachusetts, Maine, Vermont, New Hampshire, Connecticut and Rhode Island; NCS Industries Inc.—Pennsylvania, Maryland, southern New Jersey, Virginia, West Virginia, Delaware and Washington, D.C.; ComSe Sales—Georgia,

Florida, Mississippi, North and South Carolina, Tennessee and Alabama; CWY Electronics—Indiana, eastern Iowa, southern Wisconsin, Ohio, Kentucky, Illinois and Michigan; A&M Communications—Minnesota, North and South Dakota, western Iowa and northern Wisconsin; Cable Equipment Corp.—Texas (except El Paso), Oklahoma, Louisiana and Arkansas; Mega Hertz Sales—Colorado, Nebraska, Wyoming, Utah, Kansas and Missouri; CATV Services—California, Oregon, Washington, Arizona, Nevada, Idaho, Montana and Alaska; and Westfahl & Assoc.—New Mexico and El Paso.

Correction

Because of a production error, the photos of Jerrold's converter and Panasonic's converter in the September issue of CED were inadvertently switched. We regret any inconvenience this may have caused.

—Roger Brown

Beta Tech Engineering

Equipment Repairs

4112 N. 27th Avenue
Phoenix, AZ 85017
(602) 266-9389

**MDS
CATV
MATV
METERS
HEADEND
CONVERTERS
TEST EQUIPMENT**

James A. Monroe
President

Reader Service Number 54

CATV Traps and Filters

RUBEN E. LUGO
Executive Vice President



Northeast Filter Co., Inc.

14 Corporate Circle
East Syracuse, N.Y. 13057

Phones: (315) 437-7377
(315) 437-7378
Fax: (315) 437-7379

Reader Service Number 55



NaCom
LAN Division

CABLING INSTALLATION SERVICES

- industrial
- commercial
- broadband
- ethernet
- nationwide

LARRY BROWN

1-800-848-3998

1900 E. Dublin-Granville Rd. • Columbus, Ohio 43229
614-895-1313 • 1-800-848-3998

Reader Service Number 56

— CED —

The magazine of broadband technology

**THIS SPACE COULD BE YOURS NEXT TIME.
PLEASE CALL:**

Judy J. Medley
Account Executive
FAX: (303) 837-8625

600 Grant Street, Suite 600
Denver, CO 80203
(303) 860-0111

T4+ A Rebuild Ahead



Plan your future rebuilds with T4+, the fourth generation trunk and feeder cable designed to be ahead of its time. Extensive research by Times Fiber Communications led to the development of this triple bonded, gas injected foam core cable; a cable, which outperforms and outlasts all competitive products.

What makes T4+ such a high achiever? In a word – bonding. Times Fiber's proprietary adhesive continuously bonds the center conductor to the dielectric foam core, which in turn is bonded to the aluminum sheath and the sheath to the jacket. This heat activated adhesive is formulated to restrict movement, while facilitating coring. With all cable components

secured together, T4+ acts as a single system. Simply, all parts of the cable expand and contract equally over temperature extremes. Pull-outs are now just a bad memory.

T4+ also features a full wall seamless construction. The aluminum sheath is continuously extruded, not welded or fused, eliminating the possibility of pinholes and wall thickness irregularities. This con-



T4+ requires no special coring tools.

struction provides increased protection against moisture ingress and signal leakage, which improves reliability and extends life.

Due to Times Fiber's exclusive bonding process, T4+ exhibits a smaller bend radius and its handling is improved. No special tools or training is required and T4+ uses standard connectors. It goes up easier, expedites construction and therefore lowers your rebuild costs.

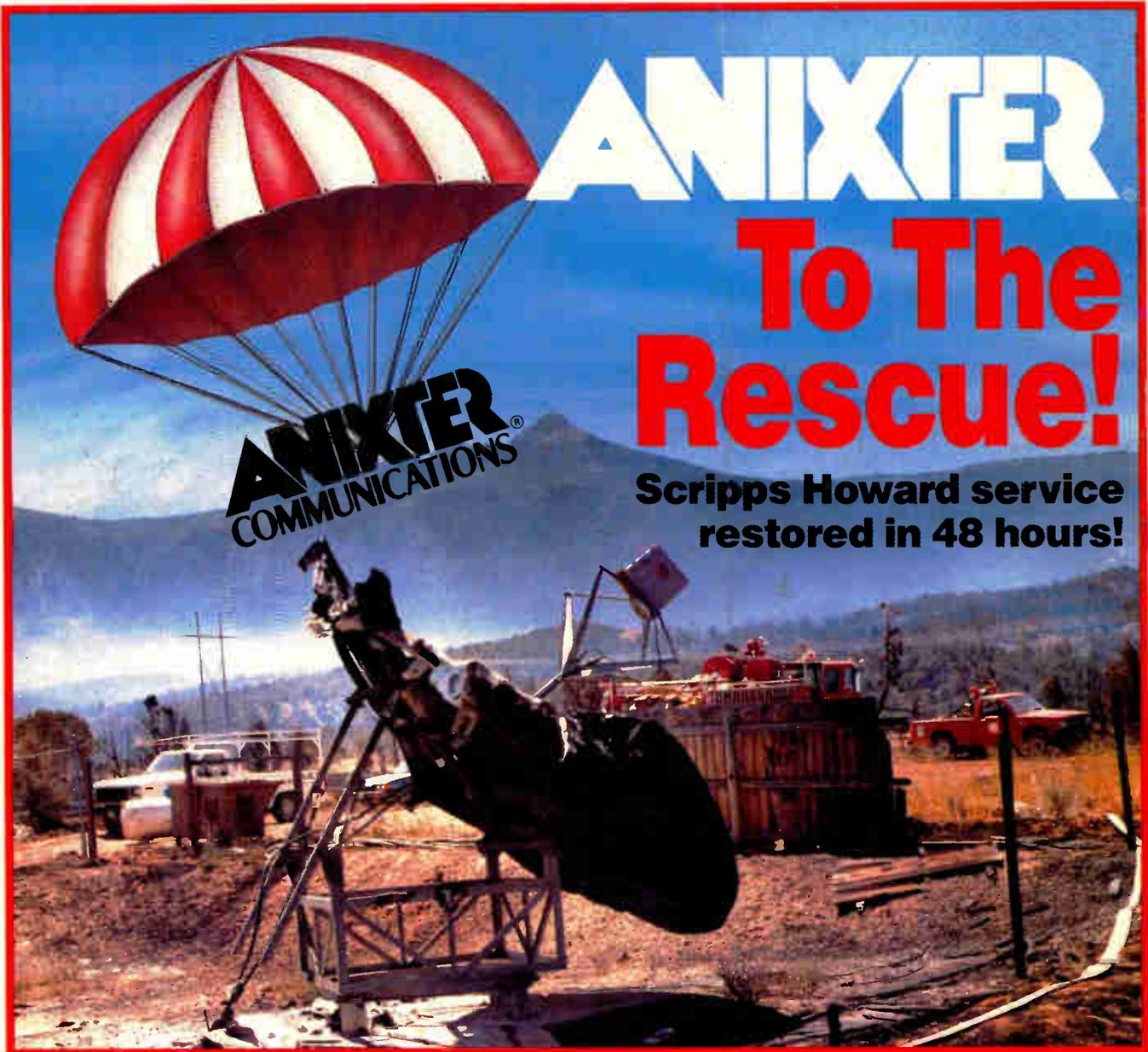
T4+ combines economic and time saving benefits with increased bandwidth capability to truly place you a rebuild ahead.

TFC TIMES FIBER COMMUNICATIONS, INC.
an
L.P.L. company

358 Hall Ave. • P.O. Box 384 • Wallingford, CT 06492

Reader Service Number 59

TFC ...Where technology meets the bottom line.



ANIXTER

To The Rescue!

ANIXTER
COMMUNICATIONS®

Scripps Howard service restored in 48 hours!

PARACHUTE, CO — Fire destroyed a Scripps Howard cable system, but service to the 900 subscribers here was restored in about 48 hours, a Scripps Howard official said.

A forest fire completely destroyed the cable headend serving Parachute and Battlement Mesa, but Greg Griffin, general manager of Scripps Howard Cable Cos. in Colorado, said help from various vendors and distributors helped get a temporary system in operation. The fire destroyed the headend on Thursday night, July 9, he said. By Friday morning,

Anixter Communications was sending out the necessary headend equipment needed to get 30 channels operating.

...Mr. Griffin said it will probably be a couple of months before a new permanent headend is constructed in Parachute, but praised the cooperation he received from Anixter and other vendors that provided equipment quickly and efficiently. "Anixter was great," he said. "Sometimes it takes two weeks to get bags of fittings from some distributors, Anixter had the stuff there the next day."

From MULTICHANNEL News — July 27, 1987

ANIXTER

COMMUNICATIONS®

CORPORATE HEADQUARTERS: ANIXTER BROS., INC., 4711 Golf Road, Skokie, IL 60076 (312) 677-2600 — Telex 289464

© 1987 Anixter Bros., Inc.

Reader Service Number 60