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Communications-Engineering Digest
Reporting the Technologies of Broadband Engineering

July 1980
Volume 6, No. 7

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C-ED News at a Glance

LAWNDALE, Calif.—**TRW RF Semiconductors plans to raise prices on its RF military and microwave transistors and related products.**

Company officials have already notified TRW sales representatives and key accounts that prices of these products are under review and that most will likely be increased.

Jim Humphrey, sales manager of the communications product plant, said the increases are necessary to offset declining unit sales of mature products and rising costs on all products.

Humphrey also said that some low-volume products will be discontinued.

MELBOURNE, AUSTRALIA—**Approval to operate a new data broadcasting service, known as Teletext, has been granted to television stations by the Australian government.**

Allowing a viewer to call for specific information on his television screen, the system includes a hand-held selector and a $300 decoder. Several stations have for the past year been transmitting test broadcasts of information, such as lottery and sports results, weather and stock prices, but only one has announced plans for public transmission.

Two hundred sets capable of receiving the service have been produced by Phillips Industries Holdings Ltd., of Melbourne, which has announced that large-scale marketing could begin with three months' notice.

DETROIT, Michigan—**Tymnet, Inc., has announced a new, low-cost electronic-originated mail service, called TYME-GRAM, intended to serve the high-volume, first class mail needs of large business users, nationwide.** TYME-GRAM, planned to be available September 1, is similar to the existing Mailgram service, but the average cost of a TYME-GRAM will be approximately one-half that of a Mailgram.

Messages from business customers will be transmitted over the TYMNET network in Zip Code sequence to 30 strategically located metropolitan areas in the U.S., where they will be automatically printed and inserted into TYME-GRAM envelopes. TYME-GRAMs then go to a nearby central post office and are entered into the postal system for next-day metropolitan delivery.

"This represents a significant reduction in cost compared to the Mailgram service," said Harcharik. "For example, a similar 1500-character Mailgram would cost even the large-volume user at least $1.92."

WALLINGFORD, CT—**A major new facility for completely integrated production of optical fibers and cable has been announced by Lawrence DeGeorge, president of Times Fiber Communications, Inc.** Culminating four years of research and development, the new plant—located in the company's headquarters complex at Wallingford, Connecticut—is expected to be operational July 1980. It will employ 30 people, including engineers, technicians, operators and inspectors, and be capable of producing 10,000 kilometers of fiber optic cable annually.

DeGeorge said that the new building will house $1.5 million of equipment, and represents the latest state of art. He said that the company has been licensed by Western Electric to utilize patents on the chemistry of glass co-invented by Dr. Douglas A. Pinnow, now Times' Director of Optical Fiber Research and Development.

C-ED (USPS 300-510) is published monthly on behalf of all parties, including the Society of Cable Television Engineers, interested in the advances of broadband technologies, by Titsch Publishing, Inc., 2500 Curtis Street, Denver, CO 80205 or P.O. Box 5400-TA, Denver, CO 80217. ©July 1980. Subscription price: 1 year, $20.00. Canada and Mexico add $6.00, and other foreign subscribers add $12.00 per year. Controlled circulation paid at Denver, Colorado. POSTMASTER: Please send Form 3579 to P.O. Box 5400-TA, Denver, CO 80217.

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Cover: Photo by Karl B. Witt, Brooks Institute, Santa Barbara, California.

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Editor's Letter

While we were at the NCTA show, a communications attorney based out of Washington handed us a memo which a friend of his had drafted, entitled "The Computer Inquiry, Deregulation, and the Bell System." The essence of that memo is that, because of a recent FCC determination (which excludes "enhanced" communications—such as teletext and other two-way interactive systems—from FCC regulation, and at the same time frees AT&T from an anti-trust ruling which prevented the telephone company from entering into unregulated information services), AT&T now has the ability to put its massive resources to work competing against other cable operators.

The memo says that, "Although it does not appear that the Computer Inquiry decision eliminates rules prohibiting telephone companies from providing or operating CATV program subscriber services, it is conceivable that such companies could compete with newspaper data-banks and CATV by furnishing, under the guise of an 'enhanced' offering, a video library or similar service whereby subscribers could selectively retrieve program material from a central file."

Now, without having gone into a great deal of research, it seems to us that this analysis just might have substantial validity. Prospective as it is, the memo doesn't try to predict the future; it merely points to possibilities.

And, frankly, the mind is boggled by the possibility of AT&T, with an R & D budget greater than the gross national products of several small countries, entering into this highly competitive field.

This issue of C-ED centers on some technology necessary for video data services, namely addressability. In addition, C-ED presents a tech review of products on display at the NCTA show.

Paul A. FitzPatrick

SCTE: Cable's Developing Information Source

This month C-ED *focuses on the staff of the SCTE—specifically Jane Rudden, Director of Meetings, Sites, and Services, and Susan Queeney, Director of Publications and Publicity.*

C-ED: As of July, it will be six months that you both have been with the SCTE. From your present perspective, how do you see the cable industry?

Queeney: Well, I worked for the NCTA a few years ago, and I left the industry for about a year and a half. Coming back, I am amazed at how much the technology has advanced. The software end has absolutely blossomed. I'm excited; the industry has really taken off. It's like watching someone grow up. And I think cable is a really good place to be.

C-ED: Have you accomplished what you set out to do in your first six months of tenure there?

Rudden: The goals, of course, are set as a group, with Judy's guidance, and with Larry Dolan's guidance, and with that of the entire board. Now, the goals that have been set not only have been met, but in many respects I think we're ahead of ourselves. We're keeping pace, and in fact we're even able to keep a few steps ahead. In my area, with the meetings and educational programs, we have met deadlines, planned and executed all the meetings, the CEU program is well under way for '80, and our attendance is growing. Of course, I'm brand new to the industry, so my observations will be as a newcomer. Frankly, I'm overwhelmed by the whole thing: the interest which these men have in learning more about their respective fields of expertise, their willingness to sit down in a classroom setting, the openness, and the honest admission that, "I've got more to learn about this business." That sort of attitude is extremely impressive. On a real, basic, human level, the allowance for human error is another aspect of this. With the logistics of planning meetings and so forth a lot of times little things will go awry. And there is never any show of annoyance with regard to these. If the coffee break is delayed a few minutes or if a room is set up the wrong way or something, it doesn't matter; they are there to **learn**—and it's that singleness of purpose that I admire. Under those circumstances, the little things will practically take care of themselves.

C-ED: Most recently, SCTE has taken a major step forward by releasing an entire series of educational video tapes. How are sales running on those?

Queeney: Well, adding to what Jane was saying about willingness to learn in meetings, from what I've seen with the publications and the video tapes, they are selling like hotcakes. I'm very, very pleased that the video taped programs have been so well received. People are enthused about them, and they're learning a great deal from them. If I can understand those video tapes, even with a non-technical background, then I think they must be the best training tools we have for new people coming into the industry—and they're also great refreshers for the folks who have been around a while. I get at least half a dozen calls every day about the content of the tapes, people suggesting new topics for future programs. . . .

Rudden: And also people volunteering to do them.

Queeney: That's right. The people thus far who have done the tapes for us, and the people we have lined up to do them in the future have just been super.

C-ED: A while back, I was talking to an engineer who expressed concern over the fact that it seems to be the same people over and over who are contributing their knowledge and expertise to committee work and teaching seminars and so forth. Have you found lately that there's been an infusion of new blood within the SCTE?

Queeney: Well, right now we're going through a phase where we have an incredible number of new members. An average of between thirty and forty each month. So there is a lot of new blood filtering into the industry. At the same time, however, we have to use the

"tried and true" talent—the folks that have been around a while—to teach the new people about what cable is all about. I think in a few years you'll find new leaders emerging from the ranks of these new members. Right now, the job facing us is to train those new people to take over. To anyone who's been in the industry for a while, it must seem like the same folks saying the same things. However, I think we all have to realize that the new people don't see it that way—in fact, they really need the expertise, wisdom, and experience that industry veterans can give.

C-ED: Your next seminar will be in Wichita.

Rudden: That's right.

C-ED: And the topic?

Rudden: That will be "Coaxial Cable or Fiber Optics?" It's scheduled to last two days, one day devoted to coaxial cable and the other to fiber optics. The program itself was originally put on in Colorado Springs, I believe. At any rate, a lot of interest was sparked, and that's why we are repeating it, with a slightly different emphasis.

C-ED: Will this session be video taped also?

Rudden: No. I'm not even sure if it will be taped aurally.

Queeney: Right now, we're sticking pretty much to studio work. We haven't done anything on location yet. Logistically, it takes a lot more hands and much more time. Doing a conference is much more difficult because of all the distractions you've got.

C-ED: After the Wichita seminar, there's one scheduled for Hawaii, correct?

Rudden: That's right.

C-ED: And after that?

Rudden: Well, in October we're scheduled to go to Great Gorge, for a program on teletext, viewdata and emerging technology in that field. After that, we'll be in Philadelphia to discuss addressability. And that wraps up 1980. The Honolulu presentation will be like "The Best of . . ." You've heard of "The Best of Saturday Night Live?" Well, this is "The Best of SCTE." Four of our mainland meetings will be combined into one huge two day meeting, for the sake of eleven systems over there. No other cable industry related association has done anything like this before. So, notwithstanding

SCTE Executive Vice President Judy Baer (center), with staff members Jane Rudden (left) and Susan Queeney.

the resort aspects of it, it will be a technical, roll-up-your-sleeves, work meeting. We'll cover preventative maintenance, microwave satellites, construction, and testing. Four panels will be going concurrently, and there will be speakers also—although we don't have a final schedule on that yet.

C-ED: What are SCTE's goals now for the next six months?

Rudden: Well, just from my own point of view, I would like to see that these next four meetings are properly executed, and successfully marketed and sold. As an organization, our goals for the year have been pretty much set; we've performed extremely well in relation to those goals during the first half of the year, and now we're going to try to make the last six months even better.

Queeney: Right now, we've got three more video tapes in the editing stage. At the end of this month we will have four more engineers coming into town to complete video tapes on various subjects. So, by August we'll have eight more video tapes—a rather ambitious undertaking. As far as publications are concerned, we have a CETA publication coming out soon. And we're presently looking toward the career market for graduates; we'll be doing a publication aimed at them entitled "Consider a Career in Cable." We will continue to publish transcripts from our conferences, and we will continue to fulfill our health and safety manual requirements.

We've got an awful lot of things going right now. Information, as we see it, is the name of the game. As long as we can keep producing, and keep filling the need for information, our membership will keep growing.

Rudden: You know, it's an interesting phenomenon to watch: we have no membership drive per se. Our members are the best champions of the cause. The new members come rolling in like there's going to be a door prize or something. It's absolutely wonderful. And one of the primary reasons for this is that, for their thirty dollar annual membership fee, members receive the information they want and need. Just from what I've seen done here, in a small office, with a few people, I am amazed. The very backbone of this organization is a combination of ideas, minds, and the very excellence of the product. It is obvious to me that the membership trusts what comes out of this office. You put the SCTE logo on something, and they know that there was a lot of thought put into it.

Queeney: We're all very proud of that trust. And it's extremely important to us to maintain it. One thing I'd like to add to what Jane said is that we listen to our members. And they come up with some awfully good ideas. Part of what makes SCTE go, after all, is the energy and the ideas that we get from our members. That's why we're here, and that's why we're a success. **C-ED**

Valtec Fiber Optics Transmitting U.S. Congress Proceedings For CATV

WASHINGTON, D.C.—Valtec Corporation, West Boylston, Massachusetts, has announced the installation of a fiber optic video and audio transmission system here to serve as part of a communications link between the U.S. Congress and cable TV subscribers across the country. The VS-100 fiber optic system and 1.3 kilometers of fiber optic cable used in the link were supplied by Valtec to the Cable Satellite Public Affairs Network (C-SPAN), a non-profit cooperative of the cable television industry. C-SPAN, with technical and installation support from local cable TV operator Arlington Telecommunications (ARTEC), provides over 750 cable operators and their subscribers with public affairs programming from the nation's capital.

Proceedings at the House of Representatives in the capitol building are first transmitted to the House Radio and TV Gallery in the Rayburn House Official Building via coaxial cable. Here, monitors and video tape recorder hook-ups are available to the media. Valtec's three-channel video/audio transmitter and fiber optic cable link the Gallery to the capitol power plant building through an underground steam tunnel connecting the two buildings. At the power plant, a microwave transmitter picks up the signal from the fiber optic receiver and transmits it to ARTEC's studio headend, five miles away in Arlington, Virginia. ARTEC distributes the programming to its subscribers and retransmits the signal to C-SPAN's satellite earth station seven miles away in Fairfax County. From here, congressional activities are beamed all over the country to subscribing CATV operating companies and franchises.

Commenting on Valtec's installation, C-SPAN's Executive Director Brian Lamb described the fiber optic system as "a vital information link to the American public." Lamb continued, "In addition to giving people a look at government activity on a day-to-day basis, C-SPAN also transmits biweekly National Press Club Luncheon speeches and a series of programs sponsored by the Close-Up Foundation. Close-Up brings high school students to Washington for week long seminars with top names in government and industry." He added that C-SPAN will be covering the presidential elections this year as well.

According to Lamb, the fiber optic system will serve as the primary transmission medium between the Rayburn and Power Plant buildings. A coaxial cable, donated by Valtec subsidiary Comm/Scope Co., Catawba, North Carolina, has been carrying the public affairs programming since March, 1979, when C-SPAN began active operation. The coax cable will now serve as a back-up to the fiber optic system.

C-SPAN's new fiber optic system consists of a VS-100 baseband video/audio transmitter and receiver set. The system is capable of transmitting three channels of video and audio over the three-fiber graded index cable supplied by Valtec to connect the fiber optic terminal equipment. Presently, C-SPAN requires the use of one video/audio channel but as programs are added in the future, Valtec's system allows automatic upgrading without additional equipment or installation expenditures.

Some of the benefits inherent to fiber optic communications were well-utilized in this particular installation, according to Bill Howard, chief engineer at ARTEC. ARTEC provided the labor to assist Valtec during the installation.

Howard explained that the cable travels from the Rayburn Building Gallery down to a garage, through a steam room, through the steam tunnel where it is tie-wrapped to the existing coax, and comes out under the capitol power plant building. "It is at this point that the cable routing becomes critical," Howard said. "The cable is forced to take between 30 and 40 90-degree turns as it winds its way up the six floors to the microwave transmitter on the roof of the power plant building. The fiber optic cable was approximately one-third the size of the coaxial cable and much more flexible," Howard noted. "Installation was completed in one-third time as the original coax because there was no splicing involved and, simply stated, the fiber optic cable was lighter and easier to handle."

Valtec's Paul Dobson, manager of cable and process engineering, noted that the fiber optic cable was run over by several cars during the garage portion of the installation but that "absolutely no damage was done to any of the three fiber channels."

Another feature of fiber optic transmission utilized in this particular application, Howard added, "is its inherent immunity to noise interference." He explained that the capitol power plant building is responsible for generating the heat and air conditioning for the capitol area and as such, is filled with large, noisy motors and machinery. "It is important in this application that there be no interruption in the information flow. And, naturally, picture quality is important too. With fiber optics, you're assured both," Howard said.

Valtec is a leading manufacturer of fibers, cables, electro-optic interfaces and systems to the communications industry. From headquarters in West Boylston, Massachusetts, Valtec serves the voice, video and data transmission markets with a wide variety of products and capabilities.

Addendum To Fiber Optics Standard Published By EIA

WASHINGTON, D.C.—The engineering department of Electronic Industries Association has announced the availability of RS-455-2, "Standard Test Procedures for Fiber Optic Fibers, Cables, Transducers, Connecting and Terminating Devices—Addendum No. 2." This addendum covers two new fiber optic test procedures (FOTPs) FOTP-23 on air leakage and FOTP-26 on crush resistance.

FOTP-23 is intended to determine the integrity of the seal of the shell/insert/contact interfaces in a fiber optics connector. It may be conducted as one of the tests in a sequential test plan and after or during the exposure of the test sample to a specified low temperature. A pressure differential is established between the front and rear faces of a mounted receptacle. The degree of leakage through the seals of the test sample is measured by means of a detection device located on the low pressure side of the test sample.

FOTP-26 is designed to determine

the ability of an interconnecting device to withstand a load that might be encountered when driven over by a wheeled vehicle.

This addendum was formulated under the cognizance of the Working Group on Fiber Optic Test Methods and Instrumentation (P-6.4) under the chairmanship of Jim Wittman of Hughes Aircraft Company.

Copies of RS-455-2 are available at $4.50 per copy from the Standards Sales Office, Electronic Industries Association, 2001 Eye Street, N.W., Washington, D.C. 20026. A free catalog of EIA & JEDEC Standards and Engineering Publications is also available upon request.

Warner Amex Receives New Franchise

CINCINNATI, OHIO—Warner Amex Cable Communications of Greater Cincinnati has been awarded a cable television franchise from Springfield Township in south central Ohio. The new franchise joins over 40 other communities in the greater Cincinnati area now being served by Warner Amex.

The addition of Springfield Township's 13,200 households brings Warner Amex's total of homes passed in the greater Cincinnati area to more than 170,000.

QUBE, Warner Amex's unique two-way interactive cable system, is scheduled to begin service in the greater Cincinnati area in the near future. QUBE systems are also currently being constructed in Pittsburgh and Houston.

Warner Amex Cable Communications is a jointly owned subsidiary of Warner Communications, Inc., and the American Express Company. It operates 147 systems in 29 states serving some 700,000 subscribers.

Deregulation of Massachusetts Cable System

WASHINGTON, D.C.—The National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce, has filed comments with the Massachusetts Cable Television Commission supporting proposals to lift rate regulation of cable television systems in that state. In 1979, the Massachusetts legislature enacted legislation sanctioning the deregulation of cable TV in areas where "adequate competitive alternatives exist." This proceeding, which is an outgrowth of an earlier enquiry in which NTIA also participated, is designed to implement this deregulation mandate in Massachusetts.

The state commission has proposed lifting rate regulation from systems if half of the subscribers can get four or more broadcast television signals over the air. Under the state proposal, communities could contest the deregulation of some cable television systems. CATV companies would have to file with the state commission a schedule showing their current rates.

Henry Geller, assistant secretary of commerce for communications and information, noted that the Massachusetts commission's proposal to rely on marketplace forces to control cable TV rates was generally consistent with the deregulatory policies NTIA and the Carter administration had urged in a number of regulated industries, including the telecommunications industry. Supporting the concept of rate deregualtion as an efficient and equitable means of opening up the cable industry, Geller cited the observation of presidential inflation fighter Alfred Kahn that all the marketplace has to do in such situations is work "as effectively as regulation," adding that "it's not hard to work 'as effectively' as regulation." Mr. Geller also noted that the Massachusetts proposal to deregulate cable rates was significant, given the trend toward less Federal regulation and the tendency on the part of other state commissions to fill the resulting "regulatory vacuum" with unnecessary and costly regulations, the cost of which is usually borne by the public.

M/A-Com, Inc. and Aetna Life and Casualty Finalize Partnership

BURLINGTON, MASSACHUSETTS—M/A-Com, Inc., has announced that it and Aetna Life and Casualty Company have formed a partnership, Local Digital Distribution Company (LDD), to provide a digital transmission and network access control equipment for local distribution of voice, high-speed data and image communications. Local distribution denotes transmission of information within a building complex or city.

M/A-Com, Inc., of Burlington, Massachusetts, and Aetna Life and Casualty Company of Hartford, Connecticut, will be equal partners in this new venture. Mr. John G. Puente, senior vice president of M/A-Com, Inc., will also serve as the president of LDD.

LDD will be a supplier of local network equipment to the common carrier and specialized common carrier industry as well as to other authorized entities such as government, private corporate and shared network users.

LDD's initial product line will include high-performance digital transmission equipment utilizing cellular microwave radio capable of operating in the 10 GHz frequency band, intrafacility bus interface units for coaxial and optical fiber cables utilizing microprocessor controlled cable terminal access units and transceiver equipment for CATV plants.

The first generation of local digital distribution equipment is in production for field trials and includes a 10 GHz central microwave radio and tranceiver and associated on-premise subscriber access system called RAPAC (Radio Packet Communications). Compatible central node and on-premise tranceiver unit equipment utilizing existing CATV distribution plant called CAPAC (Cable Packet Communica tions) is also in production.

LDD is providing a variety of CAPAC and RAPAC technical support services including local network optimization analysis, site survey coordination, installation and field maintenance.

M/A-Com, Inc., through its operating companies, Digital Communications Corporation, Microwave Associates Communications Company and Microwave Associates, Inc., is a leading supplier of equipment for satellite communications, data communications, television broadcast transmission and cable television as well as a producer of a broad range of microwave products for the government, commercial and telecommunciations markets.

Rewrite Moves Closer

By Pat Gushman, Vice President, Washington Bureau

With a scant 50 or so legislative days left in the Congressional calendar, chances are being quoted as "slim and/or none" that proponents of the communications Act rewrite will succeed in pushing a bill through before time runs out. Nevertheless, following the events of last month, the process is farther along than it has ever been—event to the surprise of some of the measure's strongest advocates.

The first breakthrough came at the end of partisan haggling in the Senate, when an omnibus compromise bill emerged.

Meanwhile, in the House, things were touch and go when it looked like Ed Markey (D-MA) and Robert Matsui (D-CA) would be able to bring the markup process and the restructuring of AT&T to a scorching halt. They failed in their attempt to stall the process, however, and the plan to allow AT&T to compete in unregulated telecommunications fields through fully separated subsidiaries is now in the hands of the parent Interstate and Foreign Commerce Committee.

According to James Broyhill (D-NC) who authored the major amendment on restructuring the telephone monopoly, Bell would be given four years to spin-off its assembly of terminal equipment; applied research, as they call it, would be transferred to the subsidiary within five years; sub-assembly for un-regulated products would have to be transferred within seven years; and all final assembly of unregulated products would have to be under the fully separated subsidiary within 10 years.

Strong feelings on the subject became apparent almost immediately when Chairman Lionel Van Deerlin (D-CA) gaveled-in the subcommittee.

What emerged from the House subcommittee deliberations will have to be reconciled with the Senate subcommittee's plans for AT&T, should the bills eventually go to a vote. S. 2827 also calls for the creation of "fully separated affiliate mechanisms" allowing dominant carriers to move into unregulated fields with the purpose of broadening services available to consumers but lessening the prospects for cross-subsidization.

Perhaps the most significant difference between the two pieces of legislation is that the House subcommittee after years of frustration in trying to revamp the entire Communications Act has settled upon addressing the more pressing needs of telecommunications (the AT&T monopoly) and not the problems of the full spectrum. The Senate subcommittee, meanwhile, continued to address broadcasting and other communications industries in what Hollings referred to as "thorough and fair treatment of an exceedingly complex field."

Not everyone is in agreement as to what is fair, however. Such is the political process. Subcommittee staffers, particularly those in the Senate who have nime to recover from the drawn out negotiations leading to the development of the compromise bill, say they have been beseiged by lobbyists seeking changes. Some of the things the Senate bill does, in addition to unbundling Bell, is keep the telephone company out of traditional cable television services in its own service area, and it also puts the burden of proof on broadcasters seeking relief from economic harm.

The Senate bill also exempts cable television from common carrier status except when it engages in providing services generally offered by "carriers." The House bill also attempts to exclude cable from common carrier status as well as prohibit dominant carriers like AT&T from providing cable service in their own service areas.

Among the initial members of this coalition are: Central Telephone, C.W.A., Continental Telephone, Electronic Funds Transfer Assn., I.B.E.W., I.C.A., and United Telecommunications, Inc.

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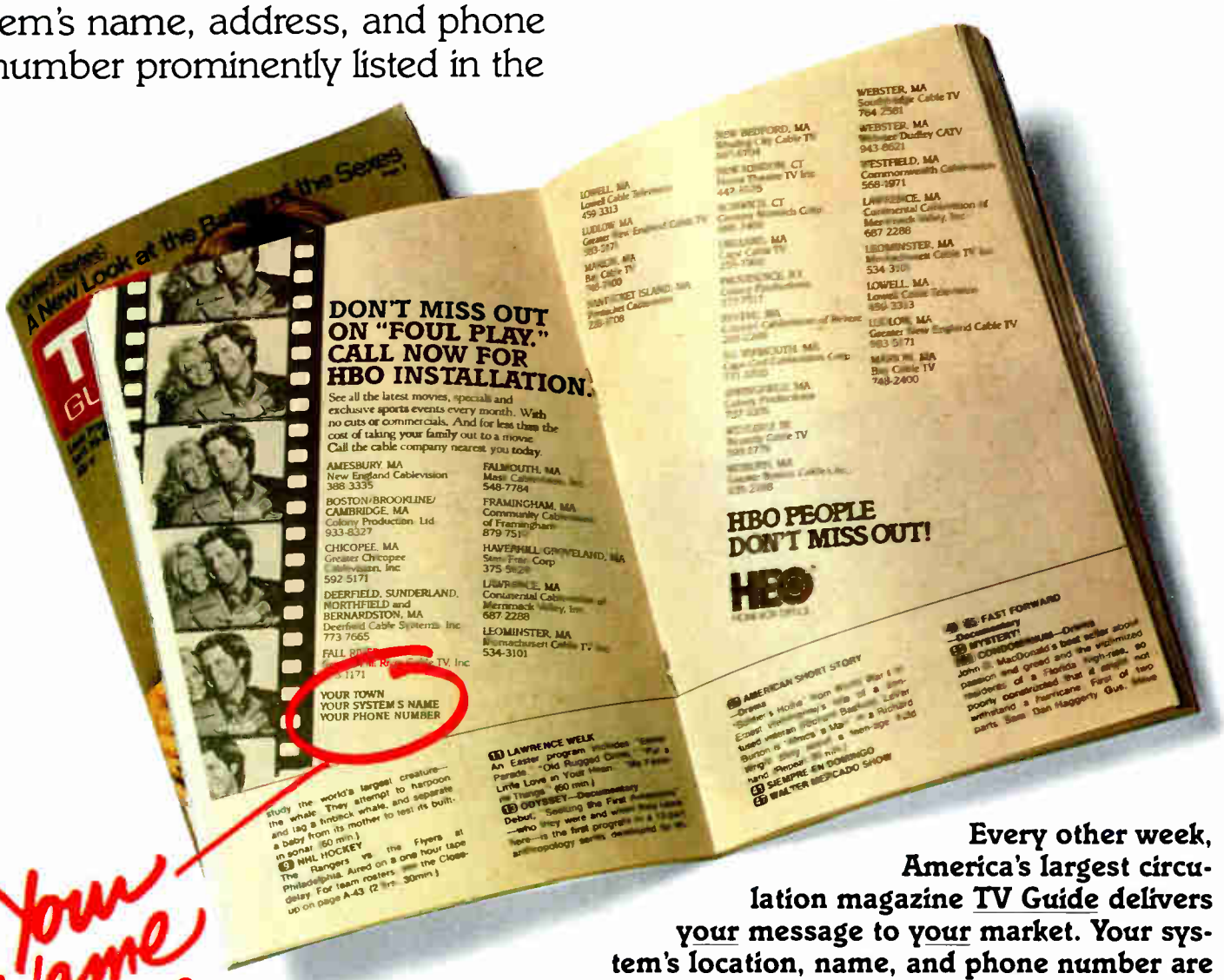

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Now, when your market wants HBO, they'll know you're the one to call—and how to reach you immediately. Because HBO, and only HBO, is putting affiliate listings in all 101 regional editions of TV Guide. That means all HBO affiliates get maximum exposure where it counts most—in their own local markets!

*AHF Marketing Research, 1980.

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Instant demand, instant results. That's what HBO's new $2 million TV Guide advertising program delivers—FREE. And only HBO—the best foundation pay TV service—makes such a massive commitment to your success.

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1980 NCTA Wrap-Up

By Gary Witt, Executive Editor

It was another record year for the NCTA Convention. This year's show—the 29th annual one for the NCTA—spotlighted the theme "Promise and Performance—Visions of the '80s." A spokesman for the NCTA reiterated that the theme's emphasis was on the relationship between the promise of the decade before us, and the performance necessary to meet the technological, economic, political, and regulatory challenges of that decade.

This year's convention was billed as the world's largest display of cable hardware and software ever. And with over 80,000 square feet of display area set aside for approximately 200 individual exhibitors, and attendance exceeding the 8000 mark, there is absolutely no doubt that indeed this cable extravaganza was the largest ever.

Technical sessions were held daily, and included topics covering the entire spectrum of engineering developments within the industry, from 400 MHz and addressability to new devices and techniques for increasing the efficiency of a system.

The first tech session centered on "Technological Change: The FCC Perspective," and featured remarks by Chris Weaver, NCTA Vice President of Science and Technology; Hank Cicconi, Vice President, Engineering, Sammons; and Cliff Paul, Senior Electronics Engineer for the FCC's Cable Television Bureau. Discussion focussed sharply on the changing role and emphasis of the FCC.

Immediately following Paul's discussion was a separate session on the new distribution technologies, specifically 400 MHz. Panelists included Mike Jeffers from Jerrold, George Luettgenau from TRW, James A. Hart from Scientific-Atlanta, and James Palmer from C-COR. Frank Bias from Viacom served as moderator.

George Luettgenau began the presentation by discussing the use of hybrids, and available technology vis-a-vis composite triple beat occurring in the extension of bandwidth to 400 MHz. Using available hybrids, noted Luettgenau, a spacing of 435 dB is possible in trunk lines. New silicon units can stretch this figure to 550. And recent developments indicate that the number can soon be extended to 645.

Luettgenau was followed by Jim Hart from Scientific-Atlanta, whose presentation was more general in nature, relating to the prospects for future development, and the technological imperative of 400 MHz.

Following Hart was a discussion by Mike Jeffers, Vice President of Engineer/ing for Jerrold. Jeffers examined some of the improvements in transmission capability which are necessary to facilitate the shift to 400 MHz utilization. Among the techniques addressed by Jeffers were phase lock, sync lock, sync suppression, and a combination of all three.

Jim Palmer, President of C-COR Electronics, was next on the agenda, with a presentation which included some rather severe criticism of the management of the larger suppliers of 400 MHz equipment. One point Palmer made was that the turnover of engineers working with major cable TV hardware manufacturers is so high that it often serves to impede productivity; at the very minimum, said Palmer, high turnover in personnel results in a lack of stability, which in turn adds to a manufacturer's inability to meet production schedules and to deliver goods on time. Much of Palmer's criticism fell on management practices at TRW, but Palmer also noted that his comments were by no means limited to TRW, and in fact could apply in various ways to all of the major manufacturers.

The technical breakout session followed, entitled "Considering Alternative Distribution Technologies: Which One for You?" Panelists included Archer Taylor of Malarkey Taylor; Austin Coryell, project engineer for ATC; Tom Polis from Comcast; Jim Stilwell from Times Mirror; and Israel Switzer. After the heated discussion initiated by Jim Palmer at the previous session, one would have expected more fireworks to fly at the breakout session; however, the latter session proved to be surprisingly lacking in controversy. One factor here was scheduling—after each of the panelists made his opening remarks, there was little time, and apparently little inclination, for serious, heated debate.

The afternoon closed with a review of the potential for audio services using cable TV systems. Hosted by Raleigh Stelle from Texscan, the panel included Ned Mountain, Senior Engineer for UA-Columbia, and Thomas Keenze, chief Engineer for United Video.

The following morning, Tuesday the 20th, began with a breakfast session entitled, "Information Technolo-

gies for Cable Television: Standards and Techniques." Panelists included Thomas Albright, Senior VP of the Printer Terminal Corporation, Joseph Blineau from Antiope Videotex Services, John Lopinto, Systems Engineer for HBO, and Harold W. Katz, Market Development Manager for Interactive Systems Inc. (a division of 3M). The session was chaired by Dr. Gary S. Tjaden from Cox Broadcasting.

Mr. Katz discussed standards for data transmission modem interface in relation to cable system operation. In addition, he touched on channel allocation, the use of 6 MHz bandwidth in data transmission configurations, modem standards and parameters, and the use of channel pairing.

The final technical session of the morning involved residential and consumer applications for cable TV informational technology. On hand were Thomas D. Smith from Scientific-Atlanta, Cliff Schrock from CableBus Systems, Robert Tenten of Manhattan Cable, and Charles Dages and Ken Coleman, both from Jerrold.

Smith and Schrock both discussed separate aspects of home alarm systems, from a marketing standpoint as well as economic. Dages and Coleman, on the other hand, were present to discuss PlayCable, by Intelevision, the new system of video games engineered by Jerrold in conjunction with Mattel. It was explained that, although Jerrold is working on a two-way interactive version of PlayCable, the present configuration is simply a software product which creates the illusion and perception of interaction by means of an on-location microprocessor.

The afternoon of the 20th, in what Norm Weinhouse of Hughes Microwave dubbed "the shortest technical session in history," the NCTA Subcommittee on Satellite Standards gave a presentation on its proposed operating practices and standards with respect to satellite transmissions.

Noting that "anyone who has monitored the output of satellite earth stations can instantly appreciate the need for some standardization," Weinhouse went on to say that "there are non-uniform levels coming out of the satellite receivers, both video and audio. There is inefficient use of subcarriers. RCA established deviation standards some time ago; plus or minus 10.75 MHz deviation for the video and plus or minus 75 kHz for the audio. But these are wide variations, especially in the audio." And, Weinhouse continued, there have been different interpretations of the precise meaning of these variations.

The next technical session was a breakfast meeting on the 21st dealing with the subject of addressable security systems. Present at the session were: Tom O'Brien from Jerrold, Charles Stern from Security Cable Systems, and Al Clark from Cybertech.

Tom O'Brien's presentation centered on alternate programs and services for cable, and the role of addressability in developing them. One problem in this field is that, although the use of sync suppression is well recognized as an effective way of achieving addressability, with the proliferation of new services the equipment necessary is rapidly becoming expensive and unwieldy. O'Brien noted that in order to combat this, manufacturers must develop entirely new technology. He then followed through with a technical explanation of how this might be done.

"The strategy necessary to produce higher cost-effectiveness in newer designs," said O'Brien, "hinges on being able to exploit the advantages of integrated circuits, particularly microcomputers and read-only memories. These devices hold the potential for improving the efficiency of circuit design, lowering the cost, and generally making everything better—from the subscriber terminal all the way up to the head-end computer."

Following O'Brien's presentation, Charles Stern of Security Cable Systems, Atlantic City, New Jersey, delivered a paper on a new "poach-free" method of cable broadcasting. Apparently, engineers at SCS have developed a system which does not require the installation of any hardware, other than the cable itself, on the subscriber's premises. "The unique aspect of the Security Cable Systems development lies in its 'tap-off,' which acts as an electronic dam; that is, it prevents the secure channel signal from entering the down-lead until such time as a signal from the headend in effect raises the floodgate, allowing the pay program to flow into the down-lead."

Stern emphasized that he is not an engineer, and his talk was non-technical. However, he did say that copies of the patents involved in the new cable security system are available from the company itself.

The next speaker was Al Clark, President of Cybertech, who examined the problem of coordinating billing procedures with addressability by means of a single centralized computer. Clark's emphasis was on the issues facing a consumer in the purchase and application of hardware.

Concurrently with the session on addressable systems, there was a separate tech session dealing with the subject of satellite scrambling and alternate security applications. Chaired by Early Monroe, this latter discussion included participation by Al Davis from HBO, John Bacon from Scientific-Atlanta, and Cliff Paul from the FCC. One of the central questions before the panel was whether or not the airwaves should be free to anyone willing to invest in reception equipment.

Al Davis began the forum discussion by stating that, although no one really wants satellite security to be necessary, the realistic approach is to investigate it as a possibility for future application. Davis went on to note that the very notion of satellite scrambling is frought with problems and obstacles. "Some of these problems," Davis commented, "are strictly logistical. Say you require four or five thousand decoders. These all have to be in place before you can throw the switch to 'scramble.' Depending on the manufacturing facilities involved, it could take several months to get the number of decoders you require. And by the time you get them, earth stations have been installed every day, every week, every month. So you have this catch-up; it could take you a year and a half after you decide to scramble before you can throw the switch and be ready."

An additional problem which Davis pointed to is the fact that the added decoder is simply one more piece of equipment which can malfunction. Redundancy will be necessary to prevent down time, and as a result system costs will double. Furthermore, according to Davis those costs are indeed substantial: decoder cost estimates presently range as high as $25,000.

The next speaker was John Bacon from Scientific-Atlanta, who chose to approach the problem of scrambling from a non-technical perspective. Bacon asked the simple question, "Are the airwaves free, and if not, should they be?" The answer was by no means simple. In fact, Bacon stated frankly that he doesn't know. "I'm not a

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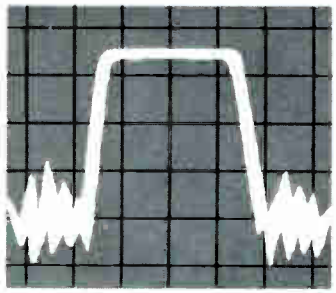

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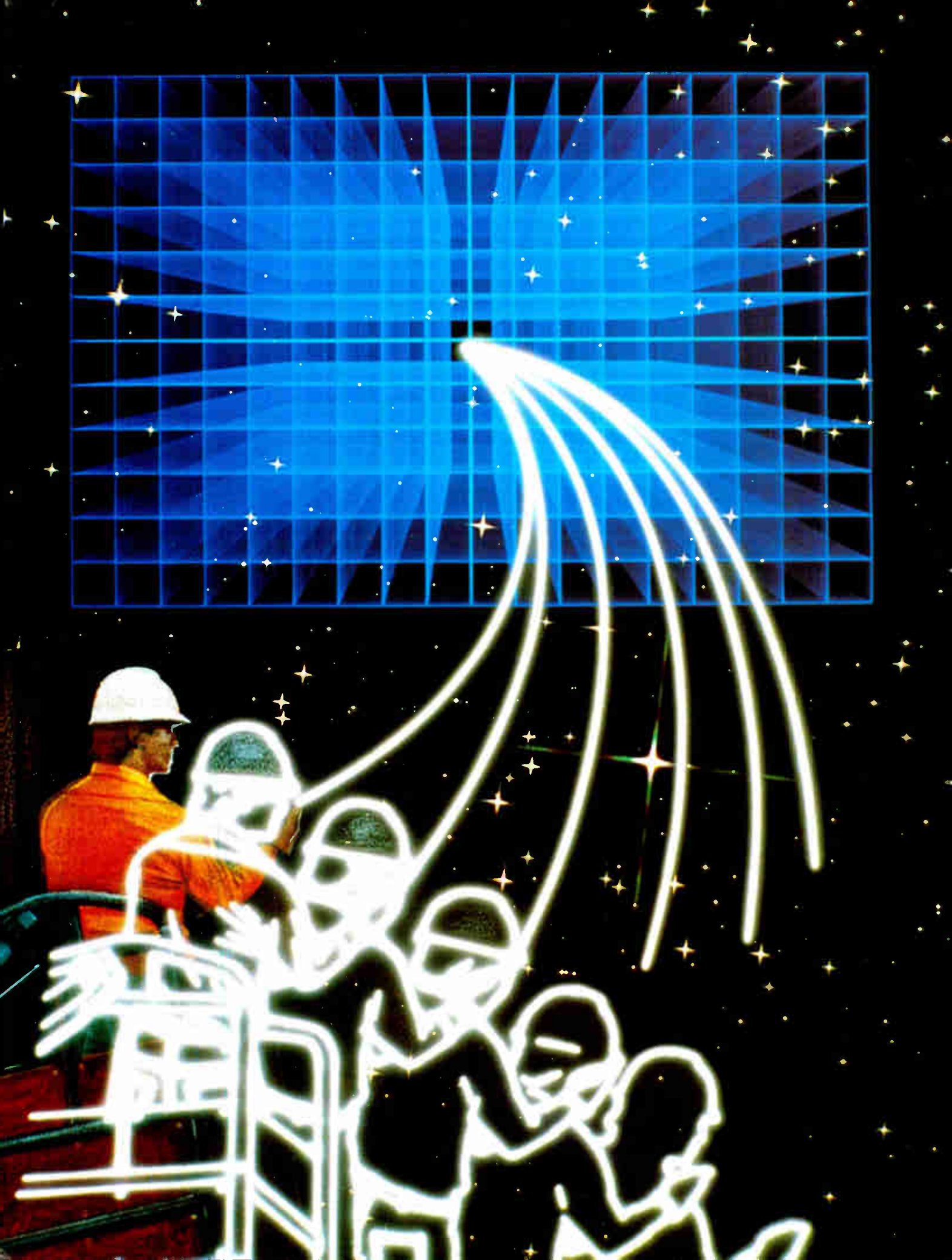

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communications lawyer," he remarked, "although I've met a lot of those that don't know either." Quoting from the October 1979 deregulation order of the FCC, Bacon noted that the security provisions of section 605 remain applicable despite deregulation. So scrambling is simply an alternative to 605 protection. But Bacon argues that "scrambling of package video programming will penalize us all, in terms of the cost of the programming, system reliability, industry logistics, hardware costs, technical quality, and possibly consumer acceptance."

Bacon says that there are non-technical ways available to secure programming. Instead of spending money to prevent people from receiving the services, the cable industry, says Bacon, should be "taking proactive steps to capitalize on these opportunities" which inhere in the demand being felt for the services.

Immediately following Bacon, Cliff Paul from the FCC gave his presentation on section 605 and the deregulation order. Paul reiterated that scrambling is an option under both 605 and the FCC order. However, he said that as a matter of his own personal opinion, "you're not really going to get any truly secured system until you get away from the analogue signal. Analogue is easy to record, it's easy to digest, it's easy to analyze, and it's easy to break." Paul also noted that a number of systems were being presented at the show for encrypting the analogue signal. Still, he urged that the solution to security must be in digital technology—but only after the initial decision is made with regard to the issue of scrambling per se.

In the question and answer period which followed, Fred Hopengarten, President of Channel One in Newton, Massachusetts, offered support for John Bacon's view of expanding market opportunities, and then posed the following question to Cliff Paul: what is the distinction under 605 between common carrier reception by a HAM at 4 MHz and common carrier reception at 4 GHz? Paul replied that there was no distinction, and that both were illegal. He later clarified this to the extent of explaining that licensed HAM operators were excluded from certain types of broadcast reception. Nevertheless, the question remains. Under the law, does reception of satellite video transmission, without re-broadcast or redistribution of the signal, constitute a violation of 605? Paul's position is clearly yes. But it is equally clear that Hopengarten disagrees.

In a news release distributed immediately prior to the opening of the show, Channel One announced that Hopengarten had been removed as a speaker from the very panel at which he posed his question. Hopengarten blames HBO for exerting pressure on the NCTA to censor him. According to the Channel One press release, upon learning that an HBO representative was to appear on the same program with Hopengarten, HBO spokesman Glenn Britt objected, and then succeeded in convincing NCTA Senior Vice President Kathryn Creech that Hopengarten should not be given the opportunity to express his views as a panelist.

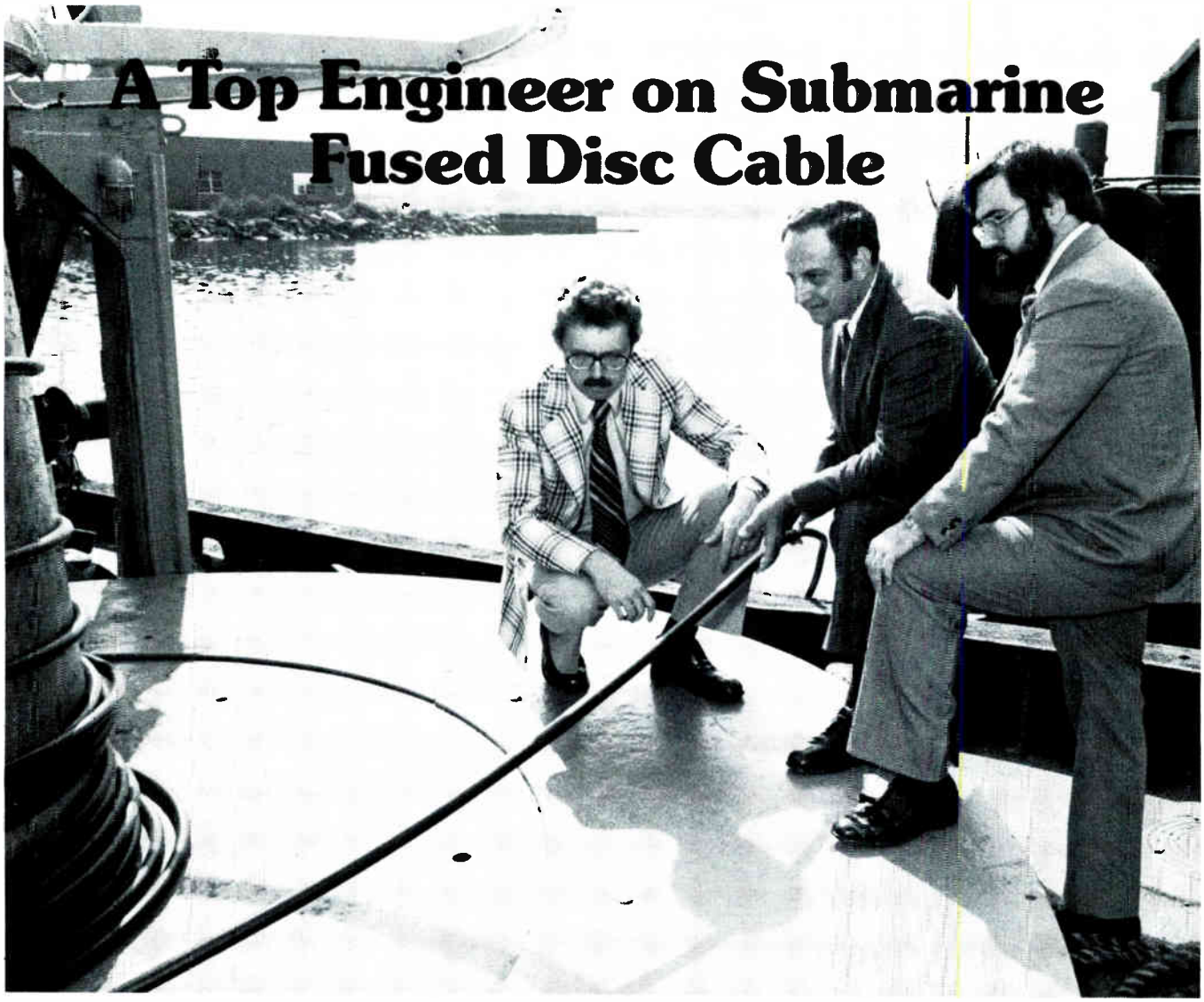
Asked to respond to Hopengarten's charges, Andy Litsky of the NCTA replied: "That is patently absurd. To imagine for a single moment that we would yield to undue pressure from any one member organization is completely ridiculous. HBO does not run the NCTA. Nor are they trying to run the NCTA. The fact is that in looking over the views which Mr. Hopengarten advocates, we simply felt that it would be inappropriate to include them on the panel. It would not have served any constructive purpose whatsoever."

For the full text of Hopengarten's proposed paper, see page 91 of this issue.

Following Hopengarten's question, Norm Weinhouse of Hughes Microwave stepped up to the microphone to ask about possible ramifications of reduced satellite orbital spacing, in view of the incredibly heavy demand for additional transponders and more satellites. Cliff Paul responded by saying that when the industry as a whole decides that the spacing should be narrowed, then the FCC will probably deal with that demand in a manner similar to its deregulation of earth stations—namely allow the move, and let the industry as a whole suffer if it turns out to be a mistake."

In general, the tech sessions were all extremely well attended, averaging between 150 and 250 participants. The dialogue created was at times exceptionally stimulating and lively. There were surprises; the seemingly routine sometimes exploded in controversy. But the overall tenor of the meetings was extremely constructive and positive.

A Top Engineer on Submarine Fused Disc Cable



Richard M. White, Vice President, Engineering for Vision Cable Communications, Inc. of New York, N.Y. had this to say in a recent letter to us:

"...Thank you and your associates for the excellent technical support supplied by General Cable through all phases of design and construction of our recent submarine cable crossing in our Bergen County, New Jersey system.

"Our primary concern was to install a cable with superior mechanical strength and high specific gravity while still retaining the same electrical characteristics as your standard Fused Disc Cable.

"Your cable design incorporating helically applied round copper wires under the jacket provides an excellent optimization of these criteria and results so far have been highly satisfactory.

"Further, I was delighted at your ability to provide Fused Disc III cable for application at 400 MHz and beyond. VCC has been a leader in the development of 400 MHz systems and two-way services with one 400 MHz system in the pre-construction stage already and with several franchises pending where we have specified 400 MHz operation."

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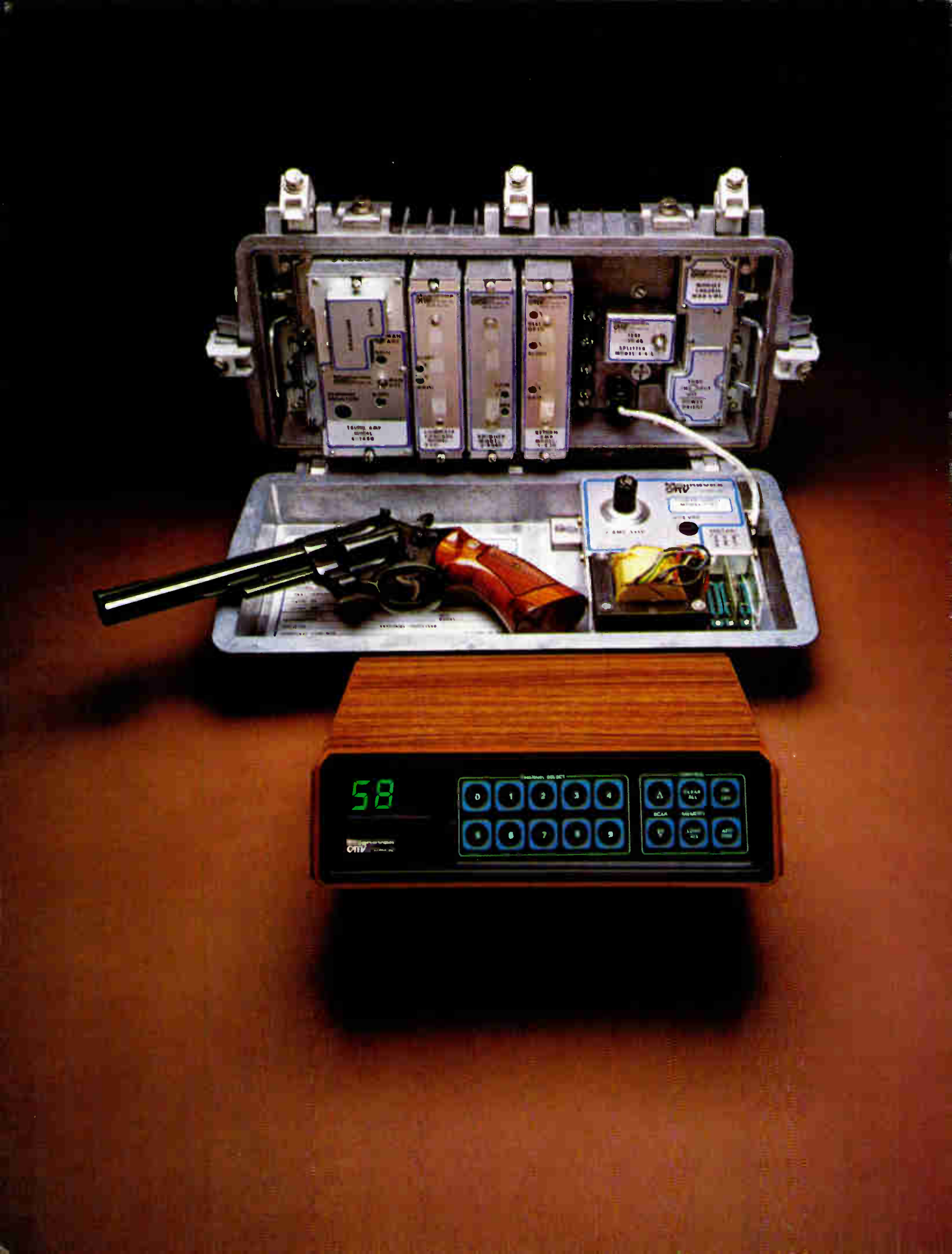
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MAGNAVOX QUALITY CONTINUES

C-ED Tech Review

This special July tech review features the various types of equipment displayed at the National Cable Television Association's 29th Annual Convention, May 18-21. In addition to the new products unveiled at the show, we have included top-of-the-line equipment from major manufacturers.

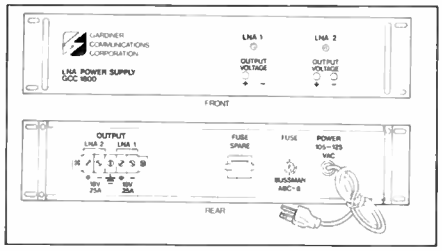
Below is a handy reference for locating specific equipment for your requirements.

Power Supplies/ Test Equipment

GCC 1800 LNA Power Supply From Gardiner

The Gardiner Communications Corporation LNA Power Supply, Model GCC 1800, provides both adequate power and unique three-stage protection circuitry for your low noise amplifiers. Power surges account for most externally-caused LNA failures. The GCC 1800 is designed to meet or exceed proposed IEEE standards for surge-withstanding capability. All components are UL approved. Results of tests conducted by Lightning Technology, Inc. are available on request.

DC LNAs presently in use require +12 or +15 volts, depending upon the manufacturer. Twelve volt storage batteries with regulated trickle chargers are widely used for LNA power. Until now, this has been the best way to provide both power and surge protection. Line losses, however, can reduce the voltage actually delivered to the LNA. And the problem of delivering +15 volts and keeping two storage batteries properly charged has been troublesome.



The GCC 1800 has two isolated +18 volt DC circuits. Each LNA is separately protected.

In addition to the surge protection circuitry, the unit has an automatic reset circuit breaker which will trip and reset itself in the event of an overload. No trip to headend to reset it manually. For further information, contact Gardiner Communications Corporation, 1980 South Post Oak Road, Suite 2040, Houston, Texas 77056, (713) 961-7348.

Powervision CATV Power Supply

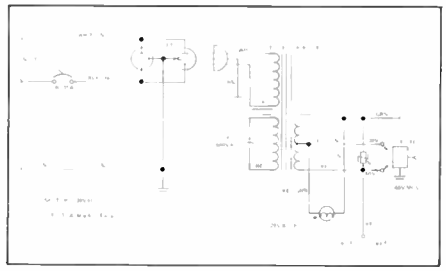
The CATV PS 750B power supply is used to supply 60V or 30V to the amplifiers of the CATV distribution system. It will operate from a conventional 95-130V AC source, providing a current capacity of 14 amperes. The unit is modular in design, creating a new convenience to component replacement.

Input protection is provided by a 15 ampere circuit breaker. Reset and/or on/off operation is by flip type actuation. Output protection is provided through internal transformer current limiting. Output voltage is restored to normal when the load returns to normal.

Built-in transient protection is provided by fast acting MOV. The MOV provides a reliable, easily replaceable control of transients, caused by lightning or other induced voltages.

Built-in R-F filter box provides additional rejection of unwanted r-f signals present in the AC power path.

Auxiliary outlet is rated at 5 amperes.



The transformer is easily disconnected from the 115V primary power by simply removing the plug. In using a primary plug of this sort, backpowering of the line, a dangerous condition, is eliminated.

The power transformer is impregnated for minimum audible vibrations and for long term durability.

The pilot lite is on during normal operation and monitors both the line voltage and power supply output.

For further information, contact Lester Equipment Mfg. Co., 1044 Pioneer Way, El Cajon, California 92020 or call (714) 588-1272.

Pax Citation: Standby System for the '80s

Small and compact, the Citation provides a regulated 60 volt square wave and up to 720 watts of output power from local AC power lines. When AC power fails, the Citation switches to battery power for sufficient time to cover most emergencies. In remote locations, where additional standby time is required, an optional auxiliary battery box provides a total of three additional hours of standby time at full rated load.

In residential areas served by underground utilities, a skirt is available to allow the unit to be mounted near ground.

The heart of the Citation is in its computer age microcircuit regulator. This sophisticated device is programmable to provide: pulse width output voltage regulation; electronic short circuit shut-down; overload protection; and "soft start" power-up circuitry.

In addition, the Citation also supplies: adjustable time delay from standby to primary power return; status monitor output load meter; and battery load voltage shut-down. A closed-loop feedback system provides voltage regulation in the inverter mode. A true rms detector continuously samples the inverter output voltage and provides a feed-back signal to maintain a constant 60 VAC output.

There are three status lamp modes: In the inverter mode, it provides a flashing signal; in the AC mode, it gives a continuous glow; and no light indicates the line is unpowered.

The battery charger is completely adjustable. Float mode operation allows use with lead cadmium and lead calcium batteries. Cycle charge mode, which brings batteries to full charge once a day, then turns off, is for extended battery life when using lead antimony or deep cycle marine batteries.

The citation can be equipped with optional battery heaters that will maintain battery temperature at approximately 65°F and near full battery capacity under all weather conditions.

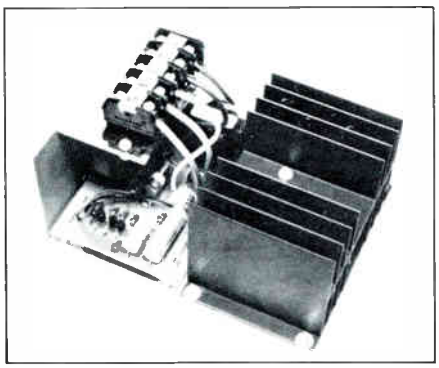
For further information, contact Control Technology, 620 Easy Street, Garland, Texas 75042, or call (214) 272-5544.

ComSonics' Armor Surge Protection System

The Armor Mark III is a self-protected device for providing surge overvoltage protection at each powering location. Solid state design avoids the problems normally associated with earlier electro-mechanical devices.

Each unit is supplied with mating interconnecting plugs, and at extra cost, a prewired harness may be purchased. For those instances when the existing power supply housing is too small for direct insertion, an optional waterproof container for housing the Armor Mark III is available.

Each Armor Mark III, from ComSonics, Inc., contains a present time delay which ultimately controls time from primary line application to constant voltage transformer output. The switching triac fires at zero crossing thus minimizing RFI generation.



Control circuit self protection is provided by a built-in Armor Mark V, triggered when primary voltage reaches three times normal. The constant voltage transformer output will be disconnected for the duration of the overvoltage condition, after which the time delay function restores normal operation. For further information, contact ComSonics Inc., P.O. Box 1106, Harrisonburg, Virginia 22801 (703) 434-5965.

New Product Line from Texscan

At the Dallas Show, Texscan and its Theta-Com division announced a total of 16 new cable TV products.

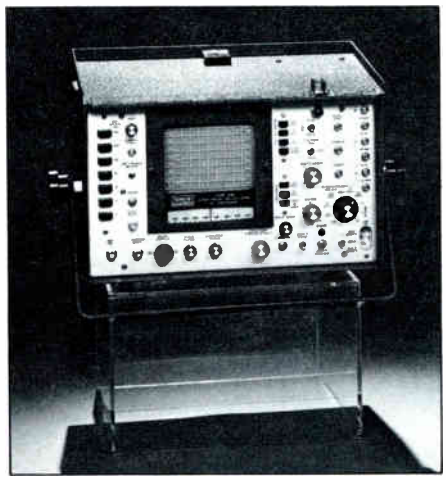
Theta Com introduced the all new "T" series of modular amplifiers in frequency ranges up to 400 MHz as well as line passives to 400 MHz, new MDS converters and block converters. At the same time, Texscan announced a complete line of 400 plus MHz test equipment, including spectrum analyzers, sweep systems, signal level meters, counters, and an all new installer's meter.

Texscan also unveiled it's "vital signs" status monitors system, a microprocessor controlled system providing amplifier interrogation and remote spectrum analyzers.

Texscan's new Installer I, for example, is a rugged instrument designed to be used in the field on a day to day basis where it will be subject to considerable abuse. It's packaged in a high impact plastic case with recessed front panel and a shoulder strap for hands—off measurement. The unit is ideal for CATV, or MATV installation applications. Installer I features a true peak detector eliminating errors due to depth of video modulation. The built-in charger and rechargeable ni-cad batteries, audible battery reminder and built-in speaker are supplied as standard features.

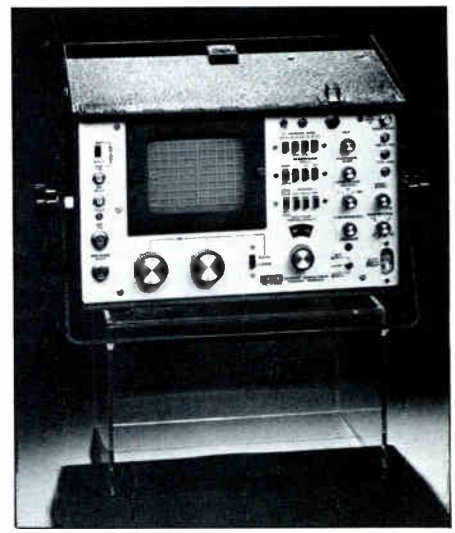
Another Texscan product is the VSM-1A, a second generation, battery-operated, portable spectrum analyzer. The VSM-1A is capable of displaying more than 60 channels of video coverage with a sensitivity of -46 dBmV.

The VSM-5B is a third generation battery operated spectrum analzyer designed specifically for applications in the cable television environment. This new instrument features laboratory performance in a field portable package with -55 dB sensitivity & 200 Hz stability with phase lock.



The 9900D from Texscan is a versatile instrument composed of a sweep generator, display oscilloscope, return loss bridge and attenuators. The 9900D provides bench sweep capability in a battery generated, field ruggedized, portable package. The size is 8" x 13" x 10.5" and the weight, including battery, is approximately 25 pounds.

Applications of the new 9900D include: amplifier alignment, cable sweeping for insertion loss and return loss, sweep testing of active passive devices, detecting illegal hookups by interpretation of return loss patterns, and numerous other sweep measurements.



Texscan's model 7272 signal level meter is a frequency selective voltmeter covering the range of 5 to 405 MHz. This frequency coverage requires no plug-in adaptors.

The Texscan leakage monitor is a system designed to detect signal leakage from CATV or other coaxial communications systems. Utilizing frequency diversity monitoring techniques, the "bloodhound," Texscan model FDM-2, provides protection of two major frequency bands, 108-136 MHz and 217-400 MHz.

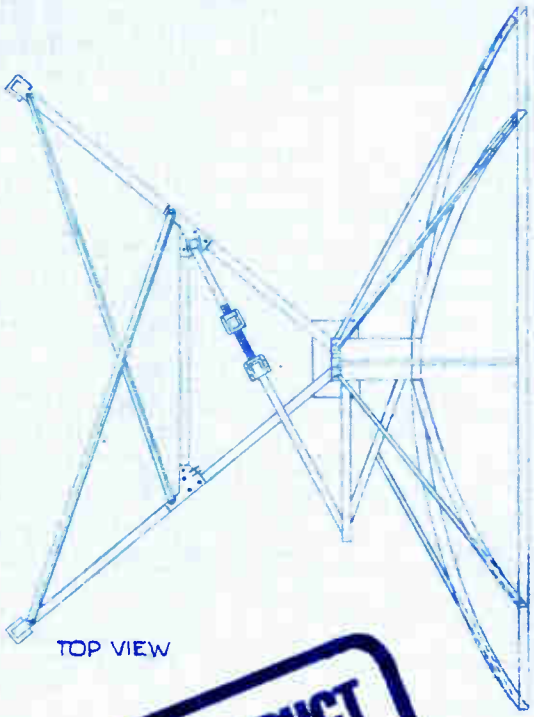
The transmitter portion of the system is a rack mount device for permanent head end installation. It transmits two modulated test signals into the system at appropriate levels.

For further information on the full line of Texscan products, contact Raleigh B. Stelle, sales manager, Texscan Corp., 2446 N. Shadeland, Indianapolis, IN 46219.

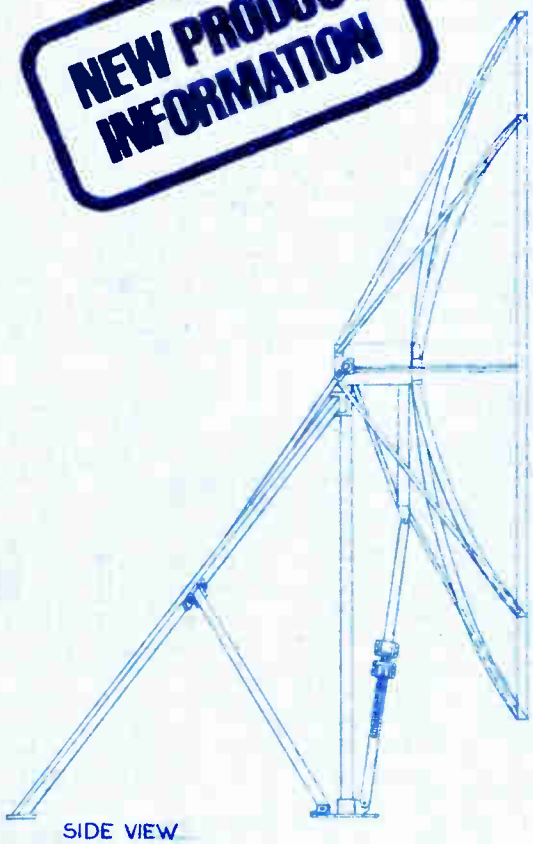
Lectro Products CATV Power Supply

This standby power supply was designed, according to spokesmen for Lectro Products, for the best reliability obtainable at the lowest possible cost. This was accomplished by using a simple reliable design without troublesome problem-causing unnecessary extras while using features that add to reliability: surge protection, metered outputs, and forced air cooling. Many

Gardiner's new 5.6 meter antenna: A classic case of "more for less."



NEW PRODUCT INFORMATION



More gain, more surface, greater efficiency. No increase in price.

Only Gardiner Communications can deliver this much performance in an earth station package for *less than $10,000.**

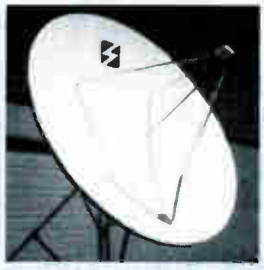
A whole new antenna design
Gardiner's petalized fiberglass antenna is a first. Eight tough fiberglass petals with incredible surface tolerance dramatically improve reflector efficiency. Designing for transmit capability has produced what we believe is the best fiberglass receiving antenna ever. Because of the critical tolerances required for transmission, Gardiner design includes a unique tension collar to provide additional fine tuning or "peaking" capability.

More surface area
Changes in transponder utilization, new proposed footprints and use of different satellites persuaded Gardiner that more surface, not less, was the way to go to assure you enough margin to deliver consistently good pictures, no matter what happens 22,300 miles away. Gardiner's new antenna delivers 55% more surface than a 4.5 meter antenna; 25% more than a 5 meter.

New feed design
The feed for the Gardiner 5.6 dramatically improves polarity isolation and contributes significantly to the higher gain — greater than 45dB.

Reliable electronics to complete the package
When Gardiner acquired the telecommunications product line of Scientific Communications, Inc., we acquired proven equipment: the workhorse 505 LNA and the compact, modular SR4000-1 and SR5000 satellite receivers. All the major components of our earth stations now come from Gardiner production lines.

Get more for less from Gardiner.
You won't find another earth station package this good for under $10,000. Find out about getting more for less today. Write or call Gardiner Communications Corporation, 1980 S. Post Oak Rd., Suite 2040, Houston, Texas 77056. Call toll-free 1-800-231-2602. In Texas, call 1-800-392-9646.



*Plus freight, installation and any applicable tax. F.O.B. Garland, Texas

Gardiner Communications Corporation
The earth station specialists

For one-way or two-way systems

NEW 400MHz DIRECTIONAL-COUPLER TAPS

SD Series Taps, Model SDT-400

featuring

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- ☐ Low Insertion Loss Across Band
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of these features are not found on the more expensive, less dependable supplies. These supplies have been used in some of the heaviest lightning areas in the country and have maintained an amazingly low failure rate.

For further information, contact Communications Distribution Corporation, P.O. Box 567, Athens, Georgia 30601, or call (404) 353-1159.

Mid State Communications Demonstrates Two New Products

At the Dallas Show, Larry Dolan, President of Mid-State Communication, unveiled two new signal level meters—the SAM II D and the SAM Jr. The SAM II D is a computer controllable version of the SAM II. A simple toggle switch converts the meter from the standard SAM II operation to the computer controlled mode. All required analog to digital control circuitry is built into the SAM II D. The SAM II D also includes a probe to measure temperature at the remote site. The front panel DB-25 connector accepts and provides the required data in RS-232 format.

The standard SAM II digital tuning circuitry is expanded to also convert the meter sigals to the digital format required. The popular RS-232 format was chosen to permit the use of the SAM II D with both low cost micro computers or large computer installations. The SAM can be accessed by telephone lines or two way cable systems by selecting proper interface unit.

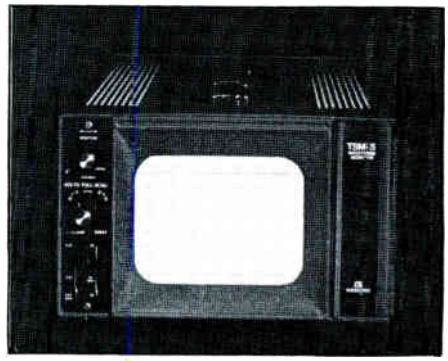
Complete documentation is the key to maximum utilization of computer controlled devices. The documentation package provided with the SAM II D contains the information required by a programmer. With this information, a program can be written to instruct the SAM II D to make the measurements you require. A program is included with the documentation to operate the popular Radio Shack TRS-ip micro computer.

The SAM Jr. is a new meter that fills in Mid State's line of signal level meters. The Jr's capabilities fall in between the LM-13 installers meter and the SAM I full performance meter. The basic electronic design is quite similar to the SAM I and SAM II which are very high quality and popular meters. The SAM Jr. has the same RF front end as these other two meters with only a slightly relaxed amplitude accuracy specification. This is very important as the RF front end is a prime factor in meter accuracy and reliability.

The mechanical design parameters take into account the rough treatment that field meters receive. The case is a high quality drawn aluminum enclosure. This case is also fitted with D-rings which adapt to the popular SKY-1 strandhook. The printed circuit board is a military type, G-10 fiberglass board. The aluminum front panel is Lexan clad, with the nomenclature back printed to assure years of use. The front panel calibration control and rechargable batteries were used to minimize the need to remove the instrument from its case. For further information, contact Mid State Communications, P. O. Box 203, Beech Grove, Indiana 46107, or phone (317) 787-9426.

TSM-5 Video Waveform Monitor

Videotek is proud to present TSM-5, the first in a series of professional video test equipment. The TSM-5 is a video waveform monitor which provides bright, sharp, easy-to-observe video waveform displays on a five inch CRT. The TSM-5 is compact, and mounts in 5¼ inches of vertical rack space and one-half 19 inches of rack width space. It features standard NTSC 525 lines, 30 frame (60 Hz field rate) scan, standard PAL 625 lines, 25 frame (50 Hz field rate) scan, selectable A/B video looping BNC inputs, AC or DC coupled. Output is separately buffered video out 1VP-P into 75 ohm termination. Sync allows selectable internal or external input. Flat, ire, chroma or differential gain filters are available, and time base figures at two-line, expanded two-line, two-field or expanded two-field. The unit includes a nine pin access connector for monitoring color processing amplifier waveforms. DC restoration is selectable. Other features include high voltage regulation and 100% solid state circuitry. For further information, including specs, contact Videotek. Inc., 125 North York Street, Pottstown, Pennsylvania 1964/(215) 327-2292, 9625 North 2lst Drive, Phoenix, Arizona 85021/(602) 997-7523.



Series 50 Optical Time Domain Reflectometer

The new Series 50 System from Times Fiber Communications comes in a variety of configurations to satisfy the needs of a broad range of end users. All units provide user-oriented features, like dual pulse width settings for optimum backscatter/attenuation and length readings. With a break sensitivity (70 dB loss . . . end enhanced) needed for in-depth troubleshooting.

The Series 50 offers plug-in compatibility with Tektronix 500 Series mainframes or stand alone interfacing with other wide bandwidth oscilloscopes. It's also available as a portable field model with the Tektronix 515 Traveler mainframe. A diversity of connectorized optical interfaces is available, with a new coupler that is not only efficient, but is designed to minimize mode selectivity.

An avalanche photodiode dector replaces the usual photomultiplier tube, optimizing spectral response and overloading characteristics. Plus, it allows a substantial cost reduction. The Series 50 delivers precision measurements in a lightweight compact unit.

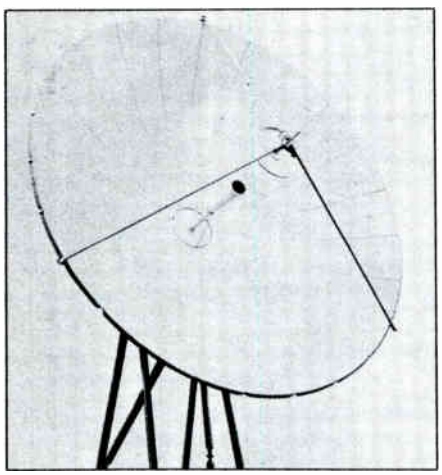
For further information, contact Times Fiber Communications, Inc. Attention: Fiber Optic Sales and Service, 358 Hall Avenue, Wallingford, CT 06492, (203) 265-8637.

Earth Stations

5 Meter Satellite TVRO Antenna System

Designed specifically to meet the growing demand for small, economical antenna systems for television receive-only and special application satellite communication earth terminals, the Model 807-6-5M-1 Antenna System offers a unique combination of high efficiency and compact packaging. Extremely light weight and low shipping volume make the system ideal for transport to, and handling at, remote locations, congested areas, or points of difficult access such as rooftop installations.

The system consists of the 5 meter (16 foot) parabolic reflector, cassegrain feed and an elevation/azimuth mount which provides 360° adjustment in azimuth and 5° to 90° in elevation.



The reflector consists of 24 stamped aluminum petals, brace struts and an aluminum center hub. The reflector is protected by a white, optically-diffusing surface paint that minimizes thermal factors created by solar heating of feed or parabolic subsystem. Assembly holes are precision drilled to facilitate accurate and trouble-free construction without the use of a template or theodolite at the site.

The cassegrain feed and ortho mode transducer insures optimum gain and dual polarized operation.

Designed with no component weighing over 150 pounds rapid on site installation without the need for a crane is assured, whether installed by the user or in conjunction with experienced Comtech supervision.

For further information, contact Comtech Data Corporation, 613 S. Rockford Dr., Tempe, AZ 85281, (602) 968-2433.

Introducing A New Low-Cost Television Modulator With High-Cost Modulation

Microdyne's new 1000 TVM Modulator provides a high quality vestigial sideband television signal. The new low cost 1000 TVM also has many high cost features including audio/visual metering. The output channels can also be easily changed by simply replacing the output converter pc board. Microdyne's 1000 TVM will readily interface with any 600 ohm balanced audio source (normally OdBm), and 75 ohm negative sync (normally IVp-p) video source.

Features of the unit include: video/audio metering; all spurious responses 60 dB down; saw IF filtering; front panel RF monitoring +60 dBmV output level; TV output channel change by replacing p.c. board; peak white level clamping; and optional IF loop through. For further information, contact Microdyne Corporation, Marketing Department CAT 1580, P.O. Box 7213, Ocala, FL 32672, (904) 687-4633.

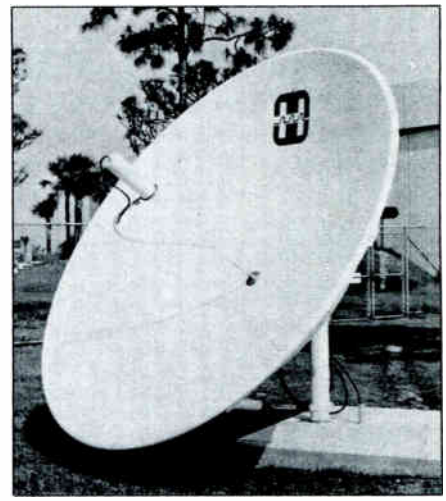
3.7 Meter TVRO Earth Station from Harris

Harris Corporation introduced its 37-meter TVRO earth station that features high eficiency prime focus fed for satellite reception, coupled with a high quality 3.7 meter (12 foot) antenna which delivers 42 dB of gain at 4 GHz.

A Harris-developed 120 degree K low-noise amplifier is mounted directly on the feed. (A dual-polarization version is available.) And, this small system also has an advanced tracking filter threshold extension demod in the Harris model 6522 receiver. The receiver delivers quality video with low signal inputs.

Harris Satellite Communications Division displayed the model 6522 Satellite Video Receiver for CATV and similar applications. It is a dual-conversion receiver and has a newly-developed tracking filter. Threshold Extension Demodulator (TED) provides an extra margin of picture quality under low level signals. The TED allows use of lower cost LNAs.

For fixed channel assignment, a



crystal controlled version of the receiver is also available. Crystals are changed through a front panel access opening. No readjustment is required after crystal change. Optional features such as additional subcarrier demodulators can be added at any time by installing plug-in cards. For further input, contact Harris Corporation, Satellite Communications Division, P.O. Box 1700, Melbourne, Florida 32901, (305) 724-3000.

Lindsay Introduces 3.6 Meter Satellite TVRO Antenna

The Lindsay 3.6 Meter earth station antenna features excellent gain and sharp directivity at a moderate cost.

The antenna utilizes pre-assembled, high tensile aluminum petal construction, mounted to self-aligning rings. The design allows for easy assembly in the field and keeps transportation cost down to a minimum.

The antenna uses a triangle mount to reflector attachment to provide maximum rigidity. The antenna also features 90 degree elevation adjust-

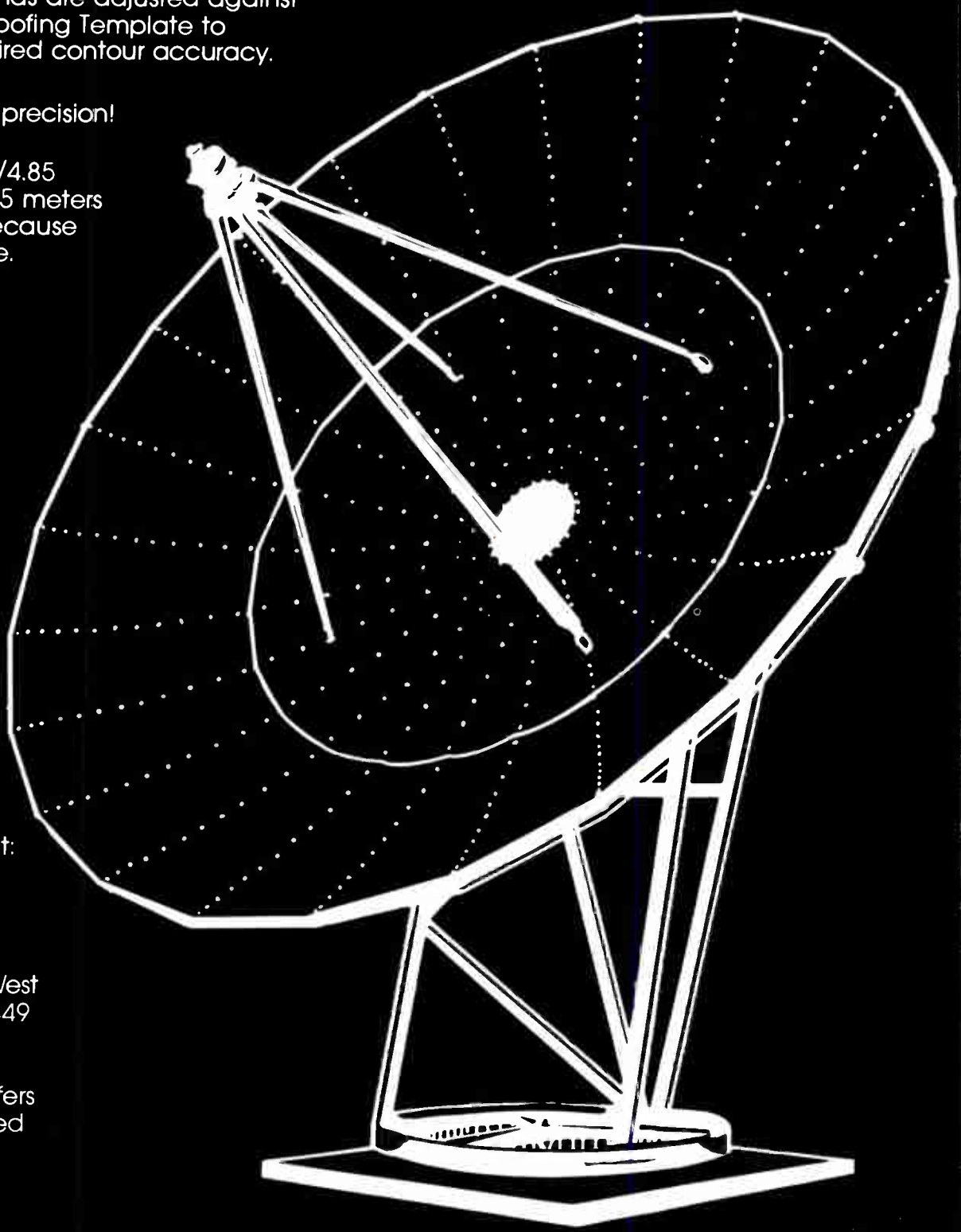
PARAFRAME™

Even before your Paraframe™ ET/4.85 Earth Station Antenna is aimed, you'll know it's going to render maximum real world gain. That's because . . .°

Paraframe antennas can be proofed on site while you watch. Paraframe antennas are adjusted against the Paraframe Proofing Template to achieve the required contour accuracy.

You can see the precision!

The Paraframe ET/4.85 provides a full 4.85 meters of gain on site because it's proofed on site.



For details contact:
Jim Vines or
Bob Christofanelli
Paraframe, Inc.
P.O. Box 423
1000 Sunset Drive West
Monee, Illinois 60449
(312) 534-7435

Paraframe also offers exclusive, protected earth station dealerships.

ment with full polar tracking capabilities.

For further information, contact Lindsay Specialty Products Limited, 50 Mary Street W., Lindsay, Ontario, Canada K9V4S7, (705) 324-2196.

Compact Video Presents The COMPACT 42

Compact Video Systems, Inc., sales division, presents its newest design in mobile-video technology—the transportable up-link Earth Station-COMPACT 42.

Easily and simply, the earth transmitting station five-meter collapsible dish antenna unfolds. Align with the satellite, test for transmission, and you're on the air, the ultimate in on-location video production.

The 42-foot fifth wheel trailer functions as a fully self-contained earth station, that can even transmit directly to the hundreds of five-meter receive-only stations.

In constructing the COMPACT 42, Compact Video Systems redesigned the exclusive Scientific-Atlanta five-meter dish to fold down for easy transportation. In addition, COMPACT invented space-age stabilizing legs to secure the dish and guarantee correct alignment and a stable signal. The legs use the trailer weight as part of a ground mounting system designed to operate in wind loads up to 60 MPH. The entire system has been designed to be set up by one man.

For further information, contact Compact Video Systems, Inc., 2813 W. Alameda Ave., Burbank, CA 91505, (213) 843-3232.

Prodelin's New Segmented Earth Station Antenna

At the Dallas Show, Prodelin was demonstrating its new segmented

earth station dish. According to information available from the company, the new antenna is available immediately in major quantities; 100 units per day capacity. In addition, warehouses on both coasts assure rapid delivery. Parts for the unit are all 100 percent interchangeable. Segments automatically self-align, and no special tools are needed to erect the dish. The 10 foot diameter antenna weighs only 140 pounds, and its shipping volume is under 60 cubic feet, allowing for substantial savings in shipping costs. All materials used have been tested and approved in accordance with MIL STD 810 B. Spokesmen for Prodelin say the unit handles the roughest weather, including hurricane force winds and beyond—up to 125 MPH.

For further information, contact Prodelin, P.O. Box 131, Hightstown, New Jersey 08520, (609) 448-2800, or 1350 Duane Avenue, Santa Clara, California 95050, (408) 727-4720.

Satellite Earth Terminal Accessory Components

The new Model A10021 bias tee enables the user at the satellite earth station to DC power the low noise amplifier through the RF output coaxial cable. This product eliminates the need for separate cabling to provide power for the LNA thereby reducing system cost and improving reliability. The model A10021 bias tee connects between the RF coaxial cable and the new Amplica Amplivider model A10023.

A special biasing technique can be incorporated into the line driver to permit biasing the antenna LNA through the RF cable. The line drivers ACD-352202 and ACD353302 feature this special bias function and are compatible with low noise amplifier series 700C-4 and bias tee A10021. For further information, contact Amplica, Inc., 950 Lawrence Dr., Newbury Park, California 91320, (805) 498-9671.

5.6 Meter Petalized Fiberglass Antenna

Gardiner's petalized fiberglass antenna is a first. Eight tough fiberglass petals with incredible surface tolerance dramatically improve reflector efficiency. Designing for transmit capability has produced what Gardiner believes is the best fiberglass receiving

THIS IS THETA-COM'S MDS CONVERTER MODEL No. TCC-1

IT HAS AN ULTRA STABLE CRYSTAL CONTROLLED OSCILLATOR...A BOON TO MULTIPLE TV SET HOOK-UPS WHICH CAN BE INDEPENDENTLY FINE TUNED.

SPECIFICATIONS

Frequency — In	2.1-2.2 GHz
— Out	Any VHF Channels 2-13
Gain	30 dB Min.
Noise Figure	5.5 dB
Temp. Range	-40 to +140 degrees F
Output Test Point	-20 dB
Max Output Level	+55 dBmV
Min Input Level	-56 dBm for 45 dB C/N
Operating Voltage	25 VAC
Housing	Aluminum
Mounting	Mast or Tower using standard Stainless Hose Clamps
Dimensions	3" x 6" x 8" W x D x H

THIS IS NO DRIFTER

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THETA-COM CATV Texscan

Theta-Com: 2960 Grand, Phoenix, Arizona 85017, P.O. Box 27548, 85061, (602) 252-5021, (800) 528-4066 TWX: 910-951-1399

Texscan Corp: 2446 N. Shadeland, Indianapolis, Indiana 46219, (317) 357-8781, TWX: 810-341-3184

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MDS CONVERTER
MODEL NO. TDC-1
LIKE IT'S COMPANION
IT ALSO HAS AN
ULTRA STABLE
CRYSTAL CONTROLLED
OSCILLATOR

Specifications:

Frequency In	2.15—2.16 GHz
Frequency Out	Channels 2—6
Gain	20 dB Min.
Noise Figure (Single Sideband)	8 dB
	(5 dB Double Sideband)
Temperature Range	-40 to +140 Degrees F
Output Test Point	-20 dB
Operating Voltage	30 VDC Nominal
Housing	Aluminum
Dimensions	2.5" x 7.3" x 7.8"

ASK ABOUT OUR LOW, LOW PRICE

ECONOMICAL

Texscan THETA-COM CATV

Texscan Corp: 2446 N. Shadeland, Indianapolis, Indiana 46219, (317)357-8781, TWX: 810-341-3184

Theta-Com: 2960 Grand, Phoenix, Arizona 85017, P.O. Box 27548, 85061, (602)252-5021, (800)528-4066 TWX: 910-951-1399

antenna ever. Because of the critical tolerances required for transmission, Gardiner design includes a unique tension collar to provide additional fine tuning or "peaking" capability. The reflector and feed combination will adapt for transmitting audio and data.

When Gardiner acquired the telecommunications product line of Scientific Communications, Inc., they acquired proven equipment: the workhorse 505 LNA and the compact, modular SR-4000-1 and SR-5000 satellite receivers. All the major components of our earth stations now come from Gardiner production lines. For further information, contact Gardiner Communications Corporation, 1980 South Post Oak Road, Suite 2040, Houston, Texas 77056, (713) 961-7348.

New Products from Hughes

The Hughes model IDC-472 downconverter is used in conjunction with the model SVR-463 receiver. The downconverter's function is to block convert the entire band 3700-4200 MHz to 950-1450 MHz for input into the receiver.

The IDC-472 downconverter is compatible with both horizontal and vertical polarizations. To accomplish this, a 20 MHz offset switch is included in the design. This offset function may be either locally or remotely controlled.

In addition, Hughes also demonstrated a system by which operators can protect satellite pay channels using a second receiver. By adding a Hughes redundant sensing and switching unit with power supply, a non-pay receiver is returned to take over the pay channel (with no signal going to the non-pay modulator), in the event the pay receiver malfunctions.

After a pre-set time delay (one to nine seconds) the sensing unit will activate video, audio and alarm relays upon A) loss of sync pulses, B) when the noise increases to a pre-set carrier-to-noise (C/N) ratio, or C) composite video level drops by 6 dB. When proper operation is restored everything is reset automatically.

Set the pay channel number on the thumbwheels. When the pay receiver fails, the second receiver is returned to tl is channel. The unit has extra contact closures for alarms or external sensing devices. For further information, contact Hughes Microwave, P.O. Box 2999, Torrance, California 90509, (213) 534-2146.

Video/Production

COMPUVID
Data Display Systems

The COMPUVID Display System contains only two printed circuit modules (video and control) which are interchangeable providing ease of maintenance. A third circuit module slot is available for memory expansion. LEDs indicating power on and input data can be seen through the front panel window.

For further information, contact Computer Video Systems, 3678 West 2150 South No. 2, Salt Lake City, Utah 84120 (801) 974-5380.

TBC—Synchronizer
For Type C Format VTRs

The VW-2 from ADDA has been designed to meet the need for high quality, economical time base correction and dropout compensation for type "C" format as well as ¾- and ½-inch VTRs. Features of the VW-2 include: full 525 lines of time base correction to prevent vertical blanking problems; detection to prevent illegal blanking, color phase inversion, vertical stepping, video breakup, and wrong field edits; heterodyne or direct color processing; vertical blanking control—adjustable between 15-21 lines; horizontal blanking fixed at 10.8 usec.; velocity compensation in the synchronize and heterodyne TBC mode; adjustable chrominance-to-luminance delay of ±200 nsec; separate jittering 3.58 MHz output to eliminate heterodyne processor for maximum signal quality; advanced vertical output to minimize video delay for multiple generation editing; and a high degree of transparency in synchronizer or TBC mode; bandwidth exceeds 2.4 MHz in heterodyne TBC mode.

For further information, contact ADDA Corporation, 1671 Dell Avenue, Campbell, California 95008, or call (408) 379-1500.

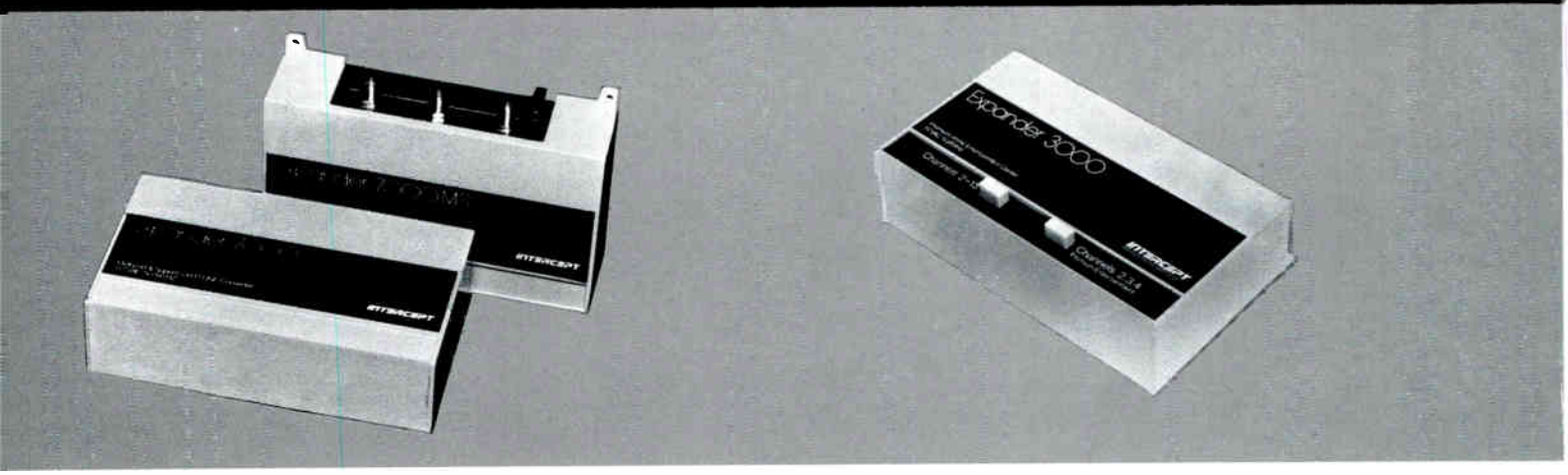
VE-6 Satellite Video Exciter

The VE-6 is a versatile and compact video earth station exciter which delivers up to +21 dBm output in the 5.925 to 6.425 GHz (C-band) satellite

(Continued on Page 61).

EXPANDER 7000, 7000 MS MID AND SUPER BAND TO UHF BLOCK CONVERTERS

EXPANDER 3000 MIDBAND TO VHF BLOCK CONVERTER



- Three Expander models to choose from for the most economical way of expanding any 12 channel system
- Low noise figure for clear, crisp pictures
- Multiple television sets may be fed from one Expander 7000 or 7000 MS
- Solid state circuitry insures low maintenance and long life

The Expander series of block converters is an economical way of adding up to 18 additional channels to a 12 channel system. There are three expander models to choose from to suit the proper system application.

The Expander 7000 will convert incoming midband Channels A-3 thru H by mixing them with a crystal controlled local oscillator which up converts these signals to UHF Channels 14 thru 24.

The Expander 7000 MS will convert nine midband Channels A thru I to UHF Channels 47 thru 55 and nine superband Channels J thru R to UHF Channels 63 thru 71.

Both Expanders have extremely low noise figures and adequate gain to provide quality pictures even with older model UHF televisions.

The Expander 3000 in the premium entertainment mode will convert midband Channels G, H and I to VHF Channels 2, 3 and 4. When the front panel push button is pressed for basic service, the unit allows feed through of standard VHF channels.

Channel Conversion Chart

Input Channel	Output Channel		
Input Channel	Expander 7000	7000 MS	3000
A-3*	14		
A-2*	15		
A-1*	16		
A		47	
B	18	48	
C	19	49	
D	20	50	
E	21	51	
F	22	52	
G	23	53	2
H	24	54	3
I		55	4
J		63	
K		64	
L		65	
M		66	
N		67	
O		68	
P		69	
Q		70	
R		71	

*If channels A3 thru A1 are used, spurious signals may be created in some of the other midband channels.

Due to the frequency of the L.O., Channel A cannot be used.

Specifications

Expander 7000

	VHF	UHF
Gain	– 1 db	+ 5 db**
Flatness	± .5 db	± 1 db
Frequency	50-300 MHz	470-536 MHz
Noise Figure		8 db
Return Loss	10 db	12 db
L.O. @ Input	– 10 dbmv	
L.O. Frequency	368 MHz	
Cross Modulation	7 Channel @ – 60 db @ 12 dbmv input	
Power Requirements	30 MA @ 117 VAC 60 Hz	
Connectors	75 OHM standard "F" female	

**Approximately – 3 db less gain for Channel H conversion

Expander 7000 MS

	VHF	UHF
Gain	± 0 db	± 1 db
Flatness	± .5 db	± 1 db
Frequency	50-300 MHz	668-818 MHz
Noise Figure		8 db
Return Loss	12 db	13 db
L.O. Frequency	548 MHz	
Input Channels	2-6, A-1, 7-13, J-M	
Output Channels	2-13, 47-71	
Cross Modulation	–60 db @ 12 dbmv Input	
Power Requirements	25 MA @ 117 VAC 60 Hz	
Connectors	75 OHM standard "F" female	

Expander 3000

Gain	4 db ± .5 db
Flatness	± .25 db
Frequency	50-300 MHz
Noise Figure	8 db
Return Loss	15 db
Mode Isolation	> 65 db
L.O. Frequency	102 MHz
Input Channels	2-6, G-I, 7-13
Output Channels	2-13 Cable Mode 2, 3, 4 Premium Mode
Cross Modulation	– 60 db @ 12 dbmv Input
Power Requirements	25 MA @ 117 VAC 60 Hz
Connectors	75 OHM standard "F" female

INTERCEPT

Intercept Corporation, 215 Entin Road, Clifton, New Jersey 07014 Telephone 201-471-2212

(Continued from Page 43).
communications band. An internal frequency synthesizer provides complete frequency agility across the band in 0.25 MHz steps. The synthesizer is controlled locally with a front panel thumbwheel switch or remotely via a BCD interface.

The exciter processes, modulates, and upconvents a single video baseband and three 15 kHz program channels operating at subcarrier frequencies of 6.2, 6.8, and 7.5 MHz. The video composite signal directly modulates a UHF carrier. A single mixer stage then upconverts to the output frequency.

For further information, contact Microwave Associates Communications, 63 Third Avenue, Burlington, Massachusetts 01803, or call (617) 272-3100.

Flexicaster Memory

The model 79-MC-2 Flexicaster is the latest version of MSI Television's microcomputer memory controllers. Flexicaster is used in applications requiring more memory than 112 lines provided by the Flexi-Kim and more sophisticated control situations such as News Selection, Data Guide, and Events programming applications as well as non-duplication switching control. Flexicaster can be used equally well as a standalone single channel memory addition or to provide data and control for up to eight separate character generator channels. Offers 50 to 800 pages of solid-state RAM memory without use of Disk memory unit.

The Remex Disk System is designed to provide flexible magnetic disk storage capability for microcomputer systems. When used with the MSI FLexicaster, the disk system may be operated with one or two disk drives (900 page capacity for single drive or 1800 page capacity for dual drive system.) The Remex system uses off-the-shelf disk cartridges and has the capability for formatting its own cartridges. The formatter P.C. card uses a Motorola 6800 microprocessor as its central processing unit. For further information, contact MSI Television, 4788 South State Street, Salt Lake City, Utah 84107, (801) 262-8475.

Ampex Introduces the New VPR-2B VTR

Ampex introduced the first practical videotape recorder in 1956, and the company has been a leader in recording technology every since. The VPR-2, unveiled in 1978, has rapidly established itself as the premier VTR of the broadcast industry. Now Ampex presents the Type "C" format VPR-2B.

Popular acceptance of the type "C" format in the worlds of entertainment, industry and education has increased worldwide use of the Ampex VPR series recorders. The VPR-2B features include: SMPTE/EBU 1-inch type "C" format; small, compact VTR; rugged, reliable VTR transport; a full line of VTR configurations—from tabletop and rackmount to full studio console with monitor bridge; lightweight for easy mobile use on location; frontal access for major mechanical assemblies and servicing of printed circuit boards behind a convenient hinged panel; flexible and accurate editing; built-in editor with automatic search-to-cue to add more creative, and for simpler and faster production work; individually replaceable video and sync head assemblies; and full remote control capability.

For further information, contact Ampex Corporation, 401 Broadway, Redwood City, California 94063.

New Message Generator Module from Channelmatic

The CMG-3008A is an eight-page color message generator which will display up to an eight-line fixed message on a color background. Up to eight different messages can be stored in its non-volatile memory. The page displayed can be selected with either a switch, a jumper arrangement, or by applying a three-bit B CD code to the page select inputs.

The generator has a custom-designed font, which includes upper and lower case letters, numbers and all common symbols. The attractive bold characters are 18 lines high to provide maximum legibility. Up to 32 characters can be programmed per line for a total message length of 256 characters per page.

For further information, please contact Channelmatic, Inc., 2232 Lindsay Michelle Drive, Alpine, California 92001, (714) 445-2691.

Integrated Basic Message System

The BEI Marquee is a microprocessor with large scale, integrated circuits for fewer components. All components are built into the keyboard housing, and it contains a Heathkit® digital weather computer for local weather instrumentation.

The CG-800 basic message system

includes: a microprocessor, controller keyboard and interface, 32 lines of 32 characters, crawl line with 1,000 characters, and RS-170 color sync. Standard features include: automatic centering, crawl line with elastic length, random display of pages, page-by-page display time. The memory for the CG-800 is divided into three areas: the title line memory, page display memory and crawl line memory. There is a four color colorizer, an interface adapter board, a news wire interface, an NOAA weather interface and weather instrumentation. For further information, contact BEI, 15315 South 169 Highway, P.O. Box 106A, Olathe, Kansas 66061, (913) 764-1900.

New Color Bar Generator

Video Data Systems introduced its BCB-100 background/color bar generator at the 1980 NCTA convention in Dallas. The BCB-100 features 70 percent saturated NTSC color bars, black burst, seven shades of gray background and can select any of 336 background colors.

It is a multi-purpose device with an EIA output signal selectable by three thumbwheel switches. The unit has a self-contained NTSC sync generator and provides an NTSC composit output. It is a general purpose signal

source usable as a color bar source for VTR and monitor set-up; sync track source for videotape track recording in preparation for editing; color background and sync source for tilting generators; and general purpose signal source.

For more input, contact Video Data Systems, 40 Oser Avenue, Hauppauge, New York 11787, (516) 231-4400.

EduTron Video Time Base Correctors

The ccd-2h series time base corrector is available in both NTSC and PAL. It is a broadcast quality time base corrector that will work with non-segmented, capstan servo and non-capstan servo, heterodyne VTRs. By using the latest technology in charge-couple-device analog memory, the ccd-2h offers excellent performance at a realistic price. The ccd-2h series is available in six different models. Operators can pick the model that best fits each application and budget. If requirements change at a later date, the ccd-2h can easily be upgraded to another model.

The ccd2h-2/ccd2h-2P has the same features of the ccd2h-1/ccd2h-1P with the addition of a RS170A (NTSC) gen-lock sync generator. This can be used to drive cameras and other video equipment in studios that do not have a sync generator. The ccd2h-3 has the same features of the ccd2h-1 with the addition of a comb filter and an adaptive noise averaging filter. This will give 10 dB of chrominance and luminance noise reduction, vertical and horizontal enhancement, and a drop out compensator. The ccd2h-4 has the features of both the gen-lock sync generator on the ccd2h-2, the comb filter, and the adaptive noise averaging filter on the ccd2h-3. For further information, contact Edutron, 11903 U.S. Highway 19, Roswell, Georgia 30075.

QuantaVision

QuantaVision™ is an automatic local origination system combining a mass-memory information display of hundreds of character generator pages with 19 random access video cassettes. The system provides programmable control over information and video sources with a single microcomputer controlled character generator and a single microcomputer controlled cassette player/changer.

The QuantaVision system includes: A QUANTAFONT™ Teleproduction Graphic Titler which acts as the system manager; a dual disc storage system for random access to mass memory display pages; and a videocassette player/changer for multiple cassette display from a single VCR which is not incldued. For further information, contact System Concepts International, 16006 Waterloo Road, Cleveland, Ohio 44110, (216) 692-3410.

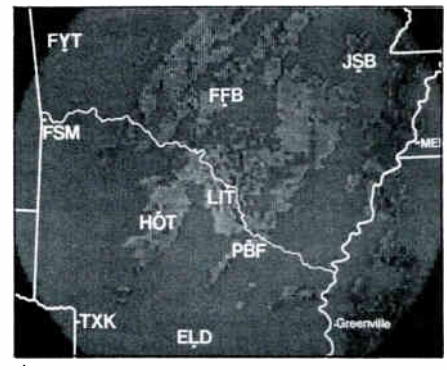
Arvin Tel-Weather™ Systems

The National Weather Service (NWS), part of the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce, operates 116 weather radars whose outputs are made available, at no cost, to professional communicators. this places a highly sophisticated, multi-million-dollar weather-radar network at your service.

Arvin has developed a complete line of equipment that provides phone-line access to any NWS weather radar and converts the radar information into TV pictures. These reasonably priced, easy-to-use weather-radar systems use state-of-the-art technology for the communications industry.

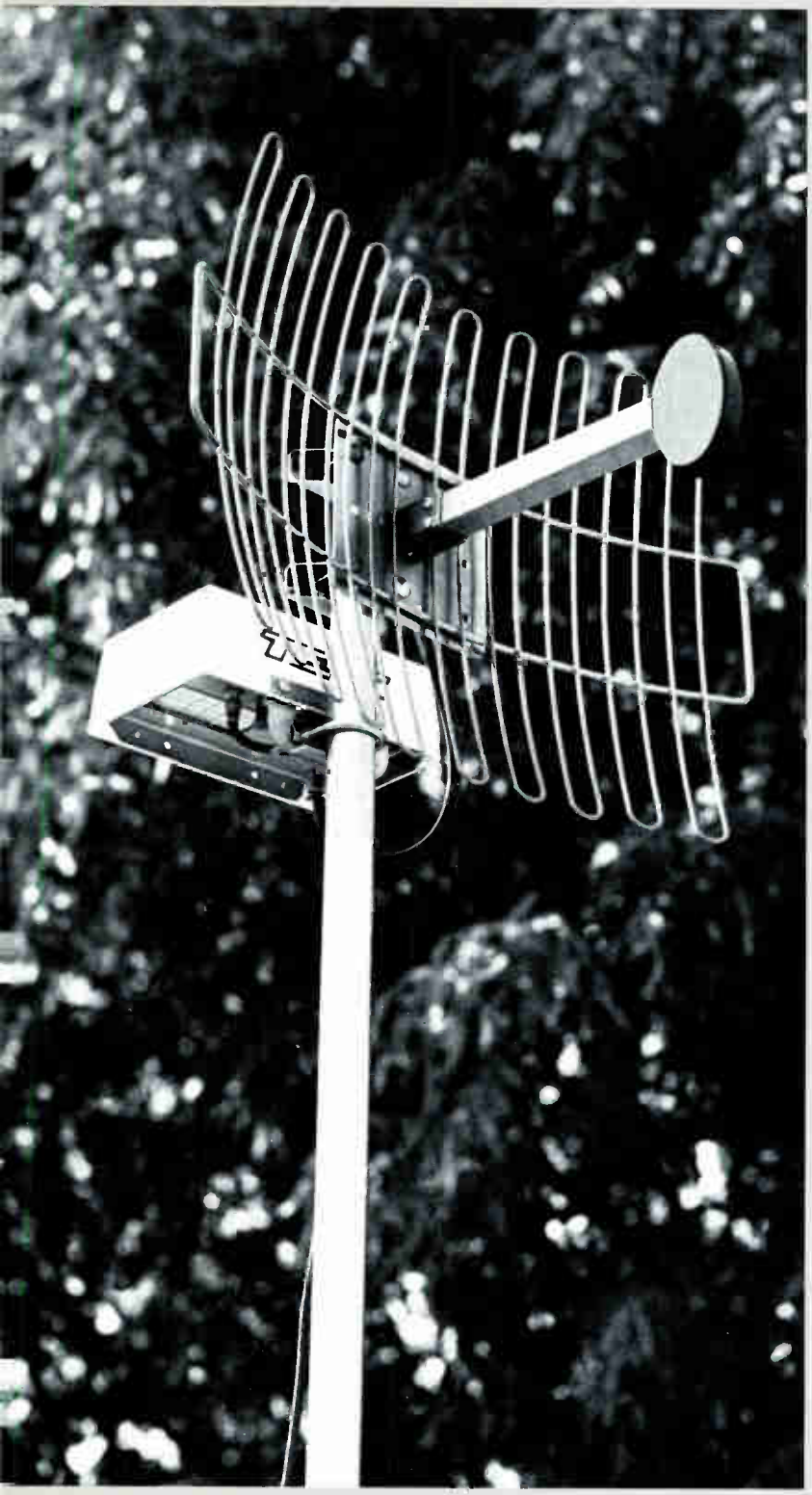
Both the Tel-Weather™ TW1 and the Tel-Weather™ TWIA receivers are designed for connection to any WBBR (weather bureau) facility by a dedicated C-2 phone line. An optional internal printed-circuit board (Type DDD-1) permits simple, dial-up phone-call connections to all 37 WBRR facilities (one at a time).

Wherever regions of precipitation are displayed on the weather radar, these regions are colored to represent the intensity of the precipitation. With the TW1, precipitation extremes are indicated by blue (zero) and yellow



TEST TODAY

THE MDS ANTENNA . . .



New from TEST, one of the many products that mark TEST TODAY.

During the last two years, we at TEST have worked with MDS operators across the country to develop the products needed now and in the future.

MDS operators have asked for an antenna that is rugged, has low wind loading, is cost effective, and is designed for easy installation.

We are proud to present TEST's lightweight MDS ANTENNA which is made of corrosion resistant steel and is designed to be strong, easy to assemble and erect.

The TEST Antenna is designed for long life and trouble free service, with a dipole that is pressure tested to keep water out. The end result is a system that will keep working even in the most extreme weather conditions.

Available in 3 sizes, the TEST Antenna meets your medium, high, and extra-high gain requirements.

Maxi-Combo Downconverter Option

TEST's new Maxi-Combo Downconvertors are designed to attach to the antenna (in place of the dipole) to form a single, easy-to-install assembly, and are available in Standard Performance and Low Noise models.

From Close-In to Deep Fringe reception areas, TEST has your equipment requirements covered.

Details and performance specifications on this and all products are available on request, please call (213) 989-4535.

TEST

Tanner Electronic Systems Technology, Inc.
16130 Stagg Street
Van Nuys, California 91409

(maximum) regions, with intermediate precipitation intensities represented by shades of blue and yellow. With the TW1A, precipitation intensities are shown as green, blue, magenta, and yellow regions.

The weather-radar map obtained from a WBRR facility usually includes the principal cities and geographic features of interest in the area scanned by the radar (as well as circles indicating range from the radar). An optional character generator (Type TWGC) permits addition to the map of any supplementary information desired.

The TW2 Direct Digital System, which incorporates a transmitter and a receiver, is capable of providing access to any weather radar system, including the 116 systems operated by the National Weather Service. For further information, contact Arvin, 4490 Old Columbus Road, N.W., Carroll, Ohio 43112, (614) 756-9211.

TV Channel Modulator Model HE-M from Triple Crown

The Model HE-M is a video/audio TV modulator designed for operation in North American TV systems. It is comprised of two basic assemblies. They are: baseband to IF modulator (41-47 MHz) and IF to output channel converter.

The complete equipment modulates baseband video and audio signals (separate audio or composite video/audio) to IF frequencies and converts to desired TV output channel within the band 5-300 MHz. The video is amplitude modulated on a 45.75 MHz carrier originated in a crystal controlled oscillator within the unit. The proper modulation requires a negatively oriented video input signal at a level of 1.0 V p.p. The video wave form is available for monitoring via video test point. The two LEDs (video mod low and high), when adjusted for equal brightness, indicate correct modulator bias for 87.5 percent modulation with 1.0 V p.p. of video input level (or .75 V p.p. at video test point).

For further information, contact Triple Crown Electronics, 42 Racine Road, Rexdale, Ontario, Canada M9W 2Z3, or call (416) 743-1481.

RTS Systems In-Line Microphone Preamplifier

The RTS 1400 microphone preamplifier is an extremely versatile tool for studio and production work. Its well-planned features, rugged construction and excellent specifications make it a professional problem solver, an audio "adapter" with countless applications. For further information, contact RTS Systems, Inc., 1100 West Chestnut Street, Burbank, California 91506, (213) 843-7022.

Radar Data Remoting System from Enterprise

Enterprise radar data remoting systems are comprised of a transmitter as well as a data receiver and are designed for use on a dedicated closed C1 telephone line or by an optional telephone dial-up voice grade telephone line.

EEC installs the systems transmitter at the customer desired weather radar station which provides the most area coverage. The transmitter converts azimuth angle, elevation angle, time, range and video data into digital information and stores it in memory. After 360 degrees of data has been stored, transmission begins via modem. The data is sent to the remote location at a speed of 2400 BAUD, with about two minutes required for transmission. The radar data receiver at the remote location accepts the incoming data and stores it in memory. The data is then formatted and displayed in color on a television monitor. The radar data receiver retains and continues to display the latest weather information received.

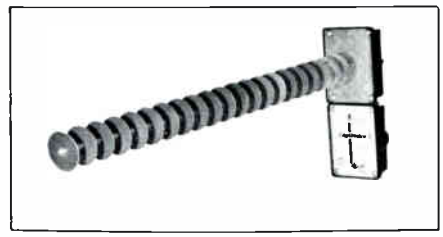
For further information, contact Enterprise Electronics Corporation, P.O. Box 1216, Enterprise, Alabama 36330, (205) 347-3478.

MDS Equipment

Lindsay Displays MDS Down Converters

At this year's National Cable Television Association's meeting, Lindsay Specialty Products, Ltd., displayed its hide away MDS down converter model PK 2121. Mechanical specifications include: aluminum housing of 1 inch OD by 14 inches; an output with type F female fitting; it weighs 12 ounces; and enables direct mounting facilities to the PK 2121 antenna series.

Lindsay also introduced its captivator I model L-1000. This model's mechanical specifications include: a die-cast aluminum housing with the dimensions of 4.5 inches by 3.5 inches



by 2 inches; it weighs one pound, has type F female fitting and a sprayed electrostatic polyurethane finish. The electrical specifications include: frequency in of channel 1 or 2; frequency out of channels 2, 3 or 4; a gain of 24 dB, a noise figure of 6 dB; an operating voltage of 12 to 16 DC; and a test point of -20 dB. For more input, contact Lindsay Specialty Products, Ltd., 50 Mary Street West, Lindsay, Ontario, Canada K9V4S7, (705) 324-2196.

Emcee Announces Television Transmitters

Emcee Broadcast Products, a division of Electronics, Missiles & Communications, Inc., announced its MDS television transmitter 2150-2162 MHz models TTS-20, TTS-20 SCA and TSA-100A at the NCTA convention. Each transmitter is calibrated from 1 to 20 watts peak visual power, enabling the user to overcome system losses while maintaining rated power at the antenna input connection.

Features include: color or monochrome transmission; all solid state circuitry except aerospace type triode final amplifier; modular design; economy of operation; LED indicators; they are designed to accomodate remote placement of modular and control panel; oven controlled crystal oscillator; individually calibrated peak output power metering; and equipment designed for 19-inch rack mounting. For further information, contact Emcee Broadcast Products, P.O. Box 116, White Haven, Pennsylvania 18661, (717) 443-9575.

New MDS Antenna From T.E.S.T.

Tanner Electronic Systems Technology, Inc., displayed its lightweight MDS antenna at the NCTA convention. Made of corrosion resistant steel, the Test antenna is designed for long life and trouble free service, with a dipole

(Continued on Page 69.)

From earth station antennas to complete electronic packages...

WE HAVE IT ALL!

One-source service from ANIXTER

Immediate "off-the-shelf" delivery of earth station antennas and electronics equipment from our computer-linked warehouse stocks.

- **Anixter-Mark 5** meter TVRO dish with easy-to-install petalized construction, dual feed and optional uplink conversion capabilities. FCC approved.
- **Microdyne** (X1S or X24) 24-channel tuneable receivers.
- **Scientific-Atlanta** 6602 24-channel tuneable receivers.
- **Amplica** 100 and 120 degree L.N.A.'s.
- **Blonder-Tongue, Catel, Jerrold, Microdyne, Scientific-Atlanta** modulators.

Choose from Anixter-Pruzan's "on-the-shelf" inventory and mix and match the components you need.

Atlanta	Chicago	Houston	Irvine, CA.	New Jersey	Seattle	St. Louis
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(800) 241-5790	(800) 323-6645	(800) 231-5006	(800) 854-0443	(800) 631-9603	(800) 426-4821	(800) 325-8058

Everything you need for CATV and PAY-TV

ANIXTER®

PRUZAN DIVISION

You ought to be in pictures.

We're in pictures, and nothing but, 24 hours a day. We're THE MOVIE CHANNEL. We built our business on the simple proposition that what cable television viewers want is movies.

The facts: According to VideoProbeIndex*, 90 percent of cable subscribers list movies as the major reason they subscribe.

And that's why you ought to be in pictures.

THE MOVIE CHANNEL lets you offer what your viewers want the most of—without specials, sports, and other programming. What's more, during the last six months, nearly two-thirds of our movies did not appear on either of the other major pay programming services.

THE MOVIE CHANNEL gives you movies around the clock. THE MOVIE CHANNEL schedules on the basis of exclusive QUBE data—putting pictures on when people want to see them.

And THE MOVIE CHANNEL has a truly localized marketing and merchandising program. Nine out of ten of your subscribers want precisely what THE MOVIE CHANNEL shows.

You really ought to be in pictures.

*VideoProbeIndex, Inc.—Cablevision May 1979.

Introducing Wavetek's 400MHz Sweep Recovery System.

While you're putting shows on those new channels for your subscribers, our new Model 1855/1865A Sweep Recovery System will be putting on quite a show for you. It sweeps and analyzes all the way from 1 to 400 MHz and provides alphanumeric readouts on the screen for amplitude and frequency. Meanwhile the viewer's screen stays sharp and uninterrupted, thanks to our high-speed sweep (down to 1 millisecond). At the same time, the picture on your 1865A stays sharp and uninterrupted because it's continuously refreshed. And memory access is now standard equipment. So reruns are instantly available.

Directing this brilliant performance is our microprocessor control. It even takes care of most of the setup procedure that used to take so long.

Of course, the star of any Wavetek show is the price. In this case, just $7,800 for the 1 to 400 MHz Model 1855/1865A. But if all you need is the 350 MHz version, you can knock off $700. To get the complete picture, just write or call: Wavetek Indiana, P.O. Box 190, 66 North First Avenue, Beech Grove, IN 46107. Toll-free 800-428-4424. In Indiana, phone (317) 783-3221.

WAVETEK®

When your subscribers have 52 channels to watch, so will you.

(Continued from Page 64.)

that is pressure tested to keep out water. Available in three sizes, the Test antenna meets medium, high, and extra-high gain requirements.

Test also showed its maxi-combo downconverter option. The new maxi-combo downconverters are designed to attach to the antenna (in place of the dipole) to form a single, easy-to-install assembly, and are available in standard performance and low noise models.

Test also displayed its new MDS receiver line with a low-noise receiver that also provides the stability of a crystal oscillator. State-of-the-art digital electronics permits this crystal stability while avoiding inefficient multiplier chains and filters.

The LNBX is powered by a fixed voltage set-top supply; the only control requiring subscriber handling is the built-in AB switch, which selects either premium programming or the signals available on the subscribers antenna.

And finally, Test displayed its Test-Com. Combining Test's downconverter electronics with a proven antenna design, the TEST-COM permits the addition of antenna directors of 5 or 7 dB gain to extend the range of this popular combo convertor cover a larger market area while retaining the ease of installation possible with these single piece units. Power and tuning of this unit is provided either by Test's Fine Tuner (MDSPT) or automatic (FLL) power supplies.

A fundamental frequency VCO provides spurious-free performance and is fully temperature stabilized. An efficient pre-selector filter reduces interference from radar and other microwave sources. For more input, contact Test, Tanner Electronics Systems Technology, Inc., 16130 Stagg Street, Van Nuys, California 91409, (213) 989-4535.

Dynacom Introduces Digicode for Overseas STV

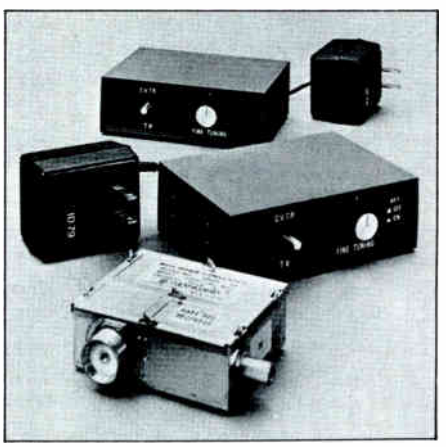
Dynacom International, Inc., a company providing English-language programming to English-speaking individuals living in foreign countries as well as offering a complete package of video broadcast services in the international marketplace, introduced at the NCTA convention its Digicode system.

The system is an over-the-air encoder/decoder system providing many of the features of an addressable system in overseas STV operations. The system is made up of an encoder installed at the transmitter site and a decoder at all viewing locations. A ticket module is used to activate the decoder.

Digicode system specifications include PAL, SECAM or NTSC; it is internally switchable to 110V 60 Hz or 220V 50 Hz; it is not affected by line voltage fluctuations; it provides a high level of security; it provides a ticket module to eliminate billing and collection difficulties; and it is available with twin lead or coax connectors. For more information, contact Dynacom International, Inc., 7194 Clairmont Mesa Boulevard, San Diego, California 92111, (714) 277-6424.

ANCON III from Standard Communications

Standard Communications Corporation introduced its ANCON III system at the NCTA convention to the MDS industry. The ANCON III system is a sealed, fully integrated package which is moisture proof, has an 18 dB antenna gain and includes a one-year warranty to protect the installer from



costs associated with any ANCON III failure. ANCON III is made of two basic components: the integrated and sealed antenna/converter assembly and the power supply.

Features of the ANCON III system include: a high antenna gain of 18 dB ±1dB; a low noise figure of 5.5 dB; a high output level from +4 dBMV to +44 dBMV. An IF output is available for channels 2, 3, 4, 5 or 6; integrated antenna/converter eliminates signal loss in interconnecting cables; and it receives either MDS Channel 1 or 2. For more input, contact Standard Communications Corporation, P.O. Box 92151, Los Angeles, California 90009, (213) 532-5300 (California), (800) 421-2916.

Bogner MDS Receiving Antenna

Bogner Multitenna Corporation of America introduced its MDS receiving antenna in a 21 dB version. The model R21's specifications include: a gain of 21 dB; a frequency band of 2150-2163 MHz. Its size is 20" x 3"; the maximum area to wind is one square foot; the maximum wind torque about mast in 87 MPH wind is 11 feet per pound; in 87 MPH wind + ½" ice is 30 feet per pound; it weighs 3.75 pounds; has a horizontal ½ power beam width of 10°; a vertical ½ power beam width of 20°; maximum (1st) side lobes of -12 dB; it has a maximum level beyond ±90° of -20dB; and a maximum VSWR of 1.2.

Its input connector is a Type N; it has a maximum cross polarization of -30 dB. It's rated input power is 100 watts C.W. It can be mounted either horizontally or vertically. It has an azimuth control of 360° and a tilt control of ±22.5°. It is sealed with drains to keep it waterproof, is aluminum and steel plated, and its off channel rejection cuts off below 1730 MHz. Temperature range is from -30° Farenheit to ±140° Farenheit, and it is lightning protected. For more information, contact Bogner Multitenna Corporation of America, P.O. Box 67, Valley Stream, New York 11582, (516) 997-7800.

Security/Converters

Warner Amex's QUBE III

QUBE III, a new generation two-way interactive cable television console, has been announced by Warner Amex Cable Communications, Inc., and Pioneer Communications of America.

The QUBE III home computer console, can accommodate up to 110 program channels and has the capacity to provide any home service, data information retrieval or video entertainment programming.

It is the most advanced system of two-way communications in the nation, and offers subscribers the ability to interact directly with the programs they are watching

For information, contact Warner

Amex at 75 Rockefeller Plaza, New York, NY 10019, or call (212) 484-6711.

Pay Trap From Microwave Filter

The super pay trap 3700 from Microwave Filter Company, Inc., applies to both audio and video. It does not disturb channels. The traps disable audio while doubling channels available for premium or other services, they do not destroy lower, adjacent channels. The 3700 gives increased allocation freedom.

The 3700 includes: 75 ohms, type F connector F61 std available video notch, 50 dB bandwidth, 300 KHz, 1 dB max 50-300 MHz with temperature variances from -20 to 85 degrees centigrade. For further input, contact Microwave Filter Company, Inc., 6743 Kinne Street, East Syracuse, New York 13057.

Viewstar Cordless Converters

The new Viewstar cordless converters from S.A.L. Communications, Inc., provide 40-channel (VS-40*) or 54-channel (VS-54-*) selections from any distance up to 25 feet without cords to interfere with viewing position. The converters feature: microcomputer technology; 40-channel selection or 54-channel selection; interference free infra red transmitter system; quartz controlled phase lock loop synthesizer; no fine tuning required; no warm up required; programmable 12-hour, 4-digit clock "time on—time off" feature; favorite channel memory and recall; auxiliary plugs for audio control; polarized convenience outlet for TV; and attaches to any TV. For more input, contact S.A.L. Communications, Inc., P.O. Box 794, 10 Hub Drive, Melville, New York 11746.

New Low-Cost 36 Channel Converter

The Standard Component Model SW-2W/3 Multi Channel Converter transforms all input channels to a single output channel. The output frequency is a channel not used by local broadcasters, thus avoiding the troublesome effect of direct pickup. Design considerations of this model are ruggedness, reliabilty and serviceability. The Converter's double conversion design with high-level double balanced mixers eliminates spurious beats and assures excellent picture quality. The band pass filter accepts all channels in the converter's range from channel 2 in the low band to channel W in the super band for a total of 36 channels.

In addition to the above qualities, ease of operation is stressed through the high-speed slide switch channel control which provides for instant channel selection. The casing is molded of high impact plastic and will withstand above average abuse. This converter is available in either a one-piece set-top or cord remote version; UL approval has been granted to both designs. Either channel 2 or 3 can be chosen as output channels or channel 4 on special order.

For further information, contact Satellite Cablevision Equipment Inc., 9144 S. Bishop, Chicago, Illinois 60620, (312) 779-2391.

The New Sylvania 58-Channel, Model 4041 Programmable Converter

The 40-channel Sylvania Pathmaker model 4041 programmable converter has been updated to provide an additional 18-channel tuning capacity, extending its bandwidth to 400 MHz. All of the important features of the original model 4041 have been maintained in this new 58-channel converter with some new ones added. HRC channel assignments are now handled without the need for internal control unit diode programming, with Channels 5 and 6 of such a system now tuned by selecting Channels 55 and 56. Channels 37, 38 and 39 of the old model, which were reserved for pay TV and other special channel applications, are now Channels X, Y and Z (at 301.25, 307.25 and 313.25 MHz) with the pay/special channels shifted to Channels 57, 58 and 59, just beyond the Channel 5 and 6 offset channels, 55 and 56.

For further information, contact Sylvania CATV Transmission Systems, GTE Products Corporation, 10841 Pellicano Drive, El Paso Texas 79935.

The Jerrold 400 Digital Converter

The new Jerrold 400 provides access to up to 58 channels on systems having a 400 MHz bandwidth, for over a 50 percent increase in revenue producing channels. And because the Jerrold 400 is available in both standard and HRC assignments, the Model DSX or Model DRX can be used when existing systems are up-graded to 400 MHz bandwidth. In addition, the attractive styling will give operators the opportunity to sell Jerrold 400 units to subscribers, rather than giving it away as part of the package.

The new Jerrold 400 is loaded with desirable features and benefits: state of the art digital technology, fewer components for high reliability; contemporary styling; high performance standards—no degradation from 300 MHz performance levels; cordless remote—secure infrared transmission technology; in-band pay and addressable options—for multi-level pay services, with or without headend addressable control.

To learn more about the new Jerrold 400 and the other items in Jerrold's line of 400 MHz products, call toll-free (800) 523-6678, or write Manager, Marketing Services, Jerrold Division, General Instrument Corporation, 2200 Byberry Road, Hatboro, PA 19040.

Programmable Video Scrambler

Microtime, Inc., introduced its new programmable video scramble system, designed to provide program security for cable originators and satellite or tape program distributors.

Called the 4001 Video Scrambler, it employs computerized encryption for code generation. A large number of codes are available, with EPROM-guided descramble available only to those authorized to receive the distribution service. For additional security, the EPROM programmer may be changed periodically.

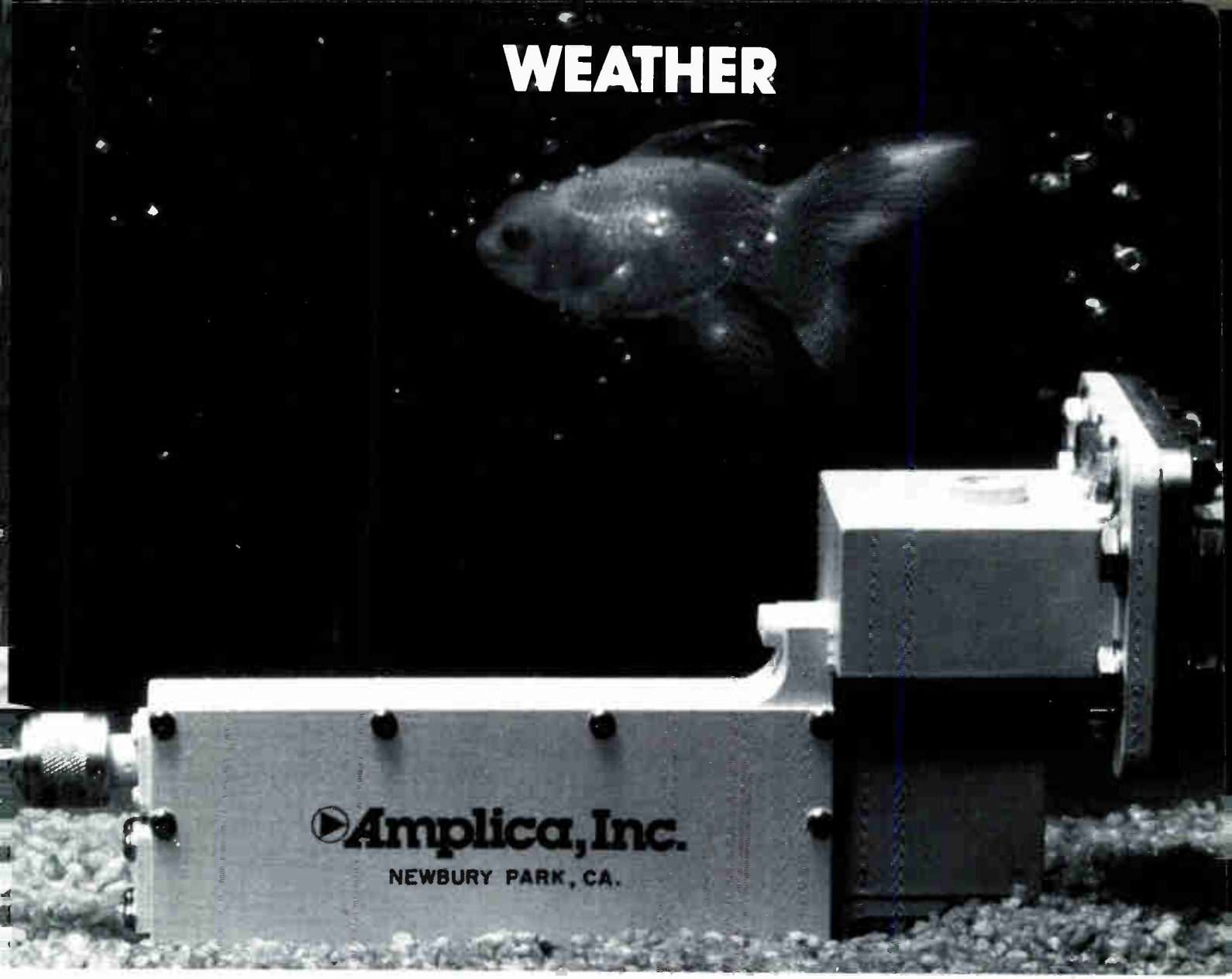
Conveniently packaged in 3.5 inches of rack space, the 4001 Scrambler produces decoded pictures of broadcast quality. Blanking geometry is not affected by the scrambling or descrambling process.

For further information, contact Adda Corporation, 1671 Dell Avenue, Campbell, California 95008, (408) 379-1500.

Cable Equipment

Ruggedized Fiber Optic Cable

At the national show, Belden Corporation displayed a variety of ruggedized fiber optic cables. Built-in impact/crush resistance and high tensile strength in each design protect



PROOF. Amplica's new 100°K and 80°K 700C series Satellite Earth Terminal amplifiers give you better performance and longer life – at competitive (often lower!) prices. They give more signal margin when you upgrade or install your Earth Terminal.

Our amplifiers are so well constructed, with dual sealing of O-rings and silicon rubber, they'll operate even under water – so surely in the worst weather imaginable. And you get better lightning protection from our reverse voltage bias circuits and transient suppression diodes.

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PLEASE SEND ME:

☐ Data sheet on Amplica 700C series amplifiers.

☐ Data sheets on Amplivider, Linedriver and Bias T.

☐ Data sheet on Amplica's redundant LNA system.

☐ An Amplica representative to discuss a special requirement with me.

C7/0

NAME _____

TITLE _____

M.S. _____

Amplica, Inc.

against mechanical damage during installation and use—without sacrificing either flexibility or workability.

These ruggedized cable designs also minimize microbending losses and protect the fiber from environmental stresses.

Optical properties are assured by advanced qulaity control measures, which include 100% attenuation testing of all finished cables. Termination consistency is assured by precise control of critical dimensions.

Standard cables feature flame-retardant materials, including buffer tubes, which are color-coded for easy identification, and light blue PVC jackets. Various colors materials and fibers are available on special order.

For further information, contact Belden Corporation, Fiber Optics Group, 2000 S. Batavia Ave., Geneva, Illinois 60134.

LRC's EFI and EI Connectors Displayed in Dallas

At the national show, LRC Electronics demonstrated two types of connectors, the EFI and the EI. The EI fitting is a marriage of proven connector designs and innovations of current co-axial connector designs. It uses the time proved LRC terminal along with the old stand-by clamp nut in a unique combination that is not only less complex, but better in many ways:

1. The EI entry connector has only two major assemblies as compared to the EFI's three.
2. The EI entry connector has fewer minor parts than the EFI (12 pieces vs. 16 pieces).
3. The preparation of the cable is easier in that the center conductor needs to be only one inch long instead of one and three eights inches.
4. With the shorter preparation the cable does not have to be pulled back as far in order to be inserted in the connector.
5. The sections of the EI fitting are not keyed as are the sections of the EFI.
6. The installation of the fitting is more reliable since there is only one clamp nut to tighten instead of two.

Current RFI testing in progress indicates isolation after three months of at least 160 db, which is equivalent to prior testing results on EMI connectors. Since the EI fitting uses the same design mandrel and clamp nut as these connectors, we believe that continuing independent testing will show at least 150 db of insulation after two years, to match or exceed the performance of the EMI connectors.

For further information, contact LRC Electronics, Inc., 901 South Ave., Horseheads, New York 14845, Phone (607) 739-3844.

EZ-SNAP™ Moulding From RMS

EZ-SNAP™ moulding duct is an entirely new mechanical engineering design utilizing the concept of "side wall pressure" to effectively hold the face plate (moulding duct cover) securely in place.

By designing the base channel with the side walls having a sufficient angular construction and retaining flanges along the upper edges, the face plate is easily and securely "snapped" into place. Some types of moulding duct provide grooves along the inside top edges of the base channel sides to hold the face plate secure. The "tongue and groove" design is not always satisfactory.

Many times, after having been extruded at an extremely high temper-

ature, the face plate (moulding cover) shrinks in the width dimension during the cooling period. When this occurs, the face plate is too narrow to fit into the retaining grooves of the base channel side walls. The results are: the face plate falls out, material is wasted, and labor costs are increased. For further information on the advantages of EZ-SNAP™ moulding, contact RMS Electronics, Inc., 50 Antin Place, Bronx, New York 10462, Telephone (212) 892-1000 - (212) 892-6700 Call Collect — (800) 223-8312 Toll Free.

Line/Headend Equipment

Coherent Headend System From Phasecom

At the Dallas show, Phasecom demonstrated its Coherent Headend System, the heart of which is the HRC System Frequency Synchronizer, Model 2805, which generates a 6 MHz comb of unmodulated reference signals.

To insure the reliability of the SFS, it is fully redundant. In the event of a problem , an electronic switch automatically substitutes the alternate back-up system. Error proof from panel test lights indicate status of both active and back-up systems.

The SFS has eight (8) equal level output ports, each of which may be fed to an eight-way active splitter, (The HRC Unity Gain SFS Divider, Model 2835). Thus, every eight coherent modulators require a Model 2835.

The unmodulated reference signal is fed to a Coherent Modulator, Model 2176, which selects and converts the appropriate frequency to IF, (See block diagram) and modulates it with the desired video and audio signals. These video and audio signals (4.5 MHz audio) are derived from a Phasecom demodulator in the case of an "off-air" signal, or from microwave or local origination sources.

The modulated IF signal is then upcovered using the same local oscillator as was used for the down conversion.

The output carrier,now modulated, is coherent with the input reference signal without the use of phaselock loops. Use of the same oscillator also permits optimal adjustment of the system's carrier phase relationships for the suppression of cross modulation distortion.

This technique is called "direct synthesis" and yields substantial improvements in the stability and performance of coherent headends

The resultant MOD/DEMOD Coherent Headend is ideally suited to the baseband processing, switching and monitoring techniques of today's modern CATV systems. For further informatio contact Phasecom Corporation, 6365 Arizona Circle, Los Angeles, CA 90045, (213) 641-3501.

RCA Introduces New 400 MHz Amplifier Line at National Cable TV Convention

A new line of amplifiers developed for 54 channel capability was introduced by RCA Cablevision Systems at this year's National Cable Television Association Convention, May 18-21.

The RCA Model 452 amplifiers accommodate an expanded bandwidth of from 50 to 400 MHz to meet the cable industry's demand for expansion beyond the 36 channel capacity of existing CATV amplifiers.

Many advanced electrical and

mechanical design features are incorporated in the new amplifier line. They include tested two-way modules, gold-plated RF connectors throughout for the highest reliability, and plug-in hybrids. RCA amplifiers are also protected for optimum performance in adverse weather conditions.

The connector interface will accept the largest one-inch cable center conductor, the shrink boot collar has been expanded for improved surface contact, and the plug-in surge arrestors are mounted directly to the housing connectors.

The RCA Model 452 amplifier group includes a Trunk, Trunk Bridger, Terminating Trunk Bridger and Intermediate/Terminating Bridger. RCA has also developed a Model 450 Line Extender and a 400 MHz series of passive components to interface with the new amplifiers. For further information, contact RCA Cablevision Systems, 8500 Balboa Blvd., Van Nuys, CA 91409.

Century III 3100 Series Feedforward

The Century III Feedforward Super-Trunk amplifier uses the latest advancements in integrated circuits, coupled with a unique method of noise and distortion cancellation, to provide reliability and stability throughout a wide temperature and frequency range; and which will produce an overall system that is relatively free of noise and distortion. This ability to cancel the distortion products of the amplifier allows the implementation of relatively long coaxial cable systems while still maintaining a quality signal at the far end.

For further information, contact Century III Electronics Inc., 3880 E. Eagle Drive, Anaheim, California 92807.

New 5-400 MHz Directional-Coupler Taps

A new family of directional-coupler taps from AM Electronics combines high isolation with low insertion loss across the entire 5-400 MHz band. Other features include: sealed spigots for reliable, moisture-proof service; input and output ports directly in line with strand to eliminate troublesome dog-legs; an umbrella-type cover design to maintain circuit reliability and RF integrity; dual-mounting flexibility for aerial or pedestal installations; and a special "molecular-adhesion" coating to protect against corrosion and to eliminate the pin-hole sources of trouble which are encountered with painted, die-cast housings.

The new 5-400 MHz taps are completely manufactured in the United States.

Detailed information is available from AM Electronics Corp., an affiliate of AM Communications, the CATV construction and service specialists, and Courier-Hooks, the strand-mapping and system-design specialists. Call/write AM Electronics, P.O. Box 505, Quakertown, PA 18951.

C-COR Announces 400 MHz Equipment

At the NCTA convention held in Dallas C-COR Electronics, Inc. announced its line of 400 MHz equipment.

C-COR's 400 MHz equipment includes trunk amplifiers with an operational spacing of 22 dB and distribution amplifiers similar in configuration to C-COR's D-500 series with a bandpass of 54-400 MHz. This equipment has

two-way capability, the reverse system has a bandpass of 5-30 MHz. All main line passives have a frequency response from 5 to 400 MHz.

Shipment of the equipment depends upon the availability of 400 MHz hybrids from the hybrid manufacturers. For further details, contact C-COR Electronics, Inc., 60 Decibel road, State College, Pennsylvania 16801, (814) 238-2461.

Sylvania Stations and Ancillary Equipment

The Sylvania Pathmaker CATV transmission equipment line is in the process of being extended to the 410 MHz frequency limit now required in many new franchises to supply subscribers with up to 53 channels of cable TV entertainment. The CATV Division of GTE Products Corporation is updating its Series 2000 trunk/bridger and Series 3000 line extending station electronics to this new requirement, complete with new 50 to 410 MHz forward amplifier modules, while still maintaining the stations' sub-VHF, to to 30 MHz return or forward transmission capability. A new multi-purpose amplifier station series will also be developed to cover both 50 to 410 MHz transmission and other requirements foreseen for large city franchises such as super band split, status monitoring, bridger switching, data communications and the like. This series, to be designated the Series 5000 Multiservice Amplifier Station, will be able to accommodate up to seven Sylvania pathmaker amplifier/control/monitor modules, two redundant, plug-in power supplies, and two auxiliary modules for switching applications of this new station series. The first to be developed will cover 50 to 410 and 5 to 30 MHz transmission applications with built-in update provisions.

Modules to be initially developed include: the dual-hybrid Model 154 trunk amplifier model; the Model 214 bridging/distribution amplifier module; and the Model 330 Total Automatic Control Module which will be designed to operate on any selected slope and level pilots up to 300 MHz. Equipment to be updated includes the Model 802 housing, the Model 505, 506, 541 and 544 base plates, the Model 750 Diplex Filter, the Series 600 Splitters and Splitter-Filters and the Series 7300 plug-in Signal Directors for Series 3000 use. The performance and technical characteristics of the described equipment are subject to change without notice. For further information, contact Sylvania CATV Division, GTE Products Corporation, 10841 Pellicano Drive, El Paso, TX 79935.

AM/FM FM Stereo Tuner for CATV Modulators

The AF-200 is a high performance, AM/FM/FM stereo, tuner. All silicon transistor and integrated circuit design insures long life and trouble-free performance over a wide range of ambient operating conditions. The FM AFC, regulated power supply and wide-range AGC circuits provide long term stability without readjustment regardless of signal, temperature, or line voltage variations.

The RF amplifier front-end on both the AM and FM sections of the tuner provides excellent selectivity, sensitivity, and rejection of spurious signals.

The high quality, 10.7 MHz IF filter, together with the integrated circuit 10.7 MHz IF amplifier and quadrature detector, provides not only excellent

selectivity but also a very linear passband. This results in true high fidelity audio and excellent stereo separation.

The FM and AM mono signal audio output from the tuner board is fed through an additonal amplifier and emitter follower stage to provide a high level 600 ohms output. The FM stereo audio outputs are fed through a 38 KHz LC fiter after de-emphasis to eliminate any residual switching components from the stereo composite signal.

The AF-200 is attractively packaged in an all-aluminum chassis with 3½" E.I.A. standard rack mount front panel. The front panel is finished in McMartin beige textured enamel, with vinyl leather grain trim.

The AF-200 may also be housed in the McMartin DTC-1 cabinet for desk top mounting.

Front panel controls consist of an illuminated "on-off" rocker switch, function selector, tuning control, and a calibrated slide rule dial with logging and AM/FM frequency scales.

For further information, contact Northern CATV Sales, Inc., 115 Twin Oaks Drive, Syracuse, New York 13206.

CAV-7 Switching Systems

The CAV-7 Series Routing Switchers have been developed to meet the small-to-moderate switching needs of AM, FM, and TV Broadcast, CATV, industrial TV and instructional TV users. While priced to compete with DA's and patch-panels, they perform to essentially the same best-in-the-industry specifications as Utah Scientific's larger AVS-1 series switchers.

Seven basic matrix configurations are offered. They are available either with or without control panels permitting them to operate as free-standing systems or to be slaved to other CAV-7 matrices or to AVS-1 systems. Two types of control panels are available—local control, where the control buttons are mounted on the front door of the matrix card cage, or remote control, where they are mounted on a separate 5¼ inch control panel. Control connection between the remote control and the matrix is via two-conductor shielded cable such as an audio pair.

A special feature of the CAV-7 Series switchers is the optional availability of frequency-shift control which permits the control signals to be carried on STL subcarrier channels or on dedicated hardwire lines over relatively long distances. This option makes the CAV-7 switcher ideally suited for studio control of switching matrices located at television transmitter sites where transmitter input switching, multi-point waveform monitoring, and TSL Input switching from multiple ENG receivers is required.

All CAV-7 switcher configurations are factory wired to provide plug-in expansion to the maximum matrix size permissible for the particular model. This allows the user to purchase a switcher adequate to meet his present-day needs while providing for simple, inexpensive expansion as his future needs may require. For further information, contact Utah Scientific, Inc., 2276 South 2700 West, Salt Lake City, Utah 84119.

Catel Series 3000 Broadband FM Transmission System

The Catel Series 3000 Broadband FM System is the professional Modulator/Demodulator System from the originators of the coax video FM concept. This system features advanced video processing, with precise CCIR emphasis characteristics, and a choice of clamping modes. A crystal controlled phaselock ensures the stability of the 70 MHz I.F. modulator. Computer designed filters with phase equalizers are used to ensure consistent performance from unit to unit. The output converter features state of the art digital circuitry to provide a wide range of frequencies from a single unit. The companion synthesized input converter in the demodulator accepts signals in the 14 to 310 MHz range. The 70 MHz I.F. demodulator uses phase equalized filtering, together with limiting and AGC (for minimal AM/PM conversion) resulting in a wide range of operational levels.

The video processors have user programmable selection of clamping modes and filtering for difficult signal conditions. all modules feature precise L.E.D. status monitors as well as monitor points for test equipment.

The 5¼ inch EIA rack mount cabinet and power supply houses up to eight 3000-Series modules. This allows a wide range of user defined combinations, such as VSB AM demod to FM remod, FM demod to FSB AM remod, Dual AM or FM Mods, Dual AM or FM Demods, etc. a maximum of three modules make up any basic subsystem. All modules feature on card regulators and all module slots have an identical universal connector pattern.

For further information, contact Catel, 1400-D Stierlin Road, Mountain View, CA 94043, (415) 969-9400.

Magnavox Introduces "Magna" Line of Components

At the national show, Magnavox unveiled its new line of 440 MHz equipment.

The Magna 440 passive directional taps and trunk-feeder couplers have been electrically upgraded to full 440 MHz bandwidth capability for use with all Magnavox Magna 440 active equipment. All series listed here are also available in the specially plated Super-Tap (ST) versions for extra protection in high-corrosion environments.

The Magnavox Magna 440 Mainstation amplifier, with a 50-440 MHz bandwidth, expands the CATV system potential beyond today's needs. It more than meets present equipment requirements and has the built-in capacity to handle future commitments. Modular-design features provide the flexibility for tailoring components to special applications.

The Magna 440 is comprised of the new 5-TH mainstation housing, 7-PS programmable power supply, universal 5-MC-2 connection chassis and Magna 440 Series of 440 MHz amplification modules.

The Magna 440 line extender series provides full bandwidth amplification for 400- and 440-MHz distribution systems. Optional return amplification and automatic gain control are available for both 30 and 60 V models.

The Magna 58 is an advanced-design 58-channel converter/descrambler with full 440 MHz capability, touch-button ease of operation and LED digital channel display.

TRW Introduces 400 MHz Hybrid

The CA4600 amplifier is a thin film hybrid gain block manufactured with a gold monometallic process for high reliability. The push-pull circuitry has been optimized for 400 MHz 75Ω CATV systems requiring excellent impedance match, superior dynamic range, signature free flat response, and low distortion and noise figure. The proven circuitry provides superior thermal stability and output capability. Facility for phase inversion is provided via

balanced output pins.

For further information, contact TRW at 14520 Aviation Blvd., Lawndale, California 90260.

Miscellaneous

Teletex Electrostatic Printer

An inexpensive electrostatic hard-copy printer which outputs onto aluminized paper is available to enable users to keep a record of information accessed via Antiope.

The printer, developed by the CCETT in conjunction with the company Telematique (in Meylan, Grenoble, can be connected to any Antiope broadcast-Teletel interactive terminal.

In 20 seconds, the IM 816 produces an exact copy on paper of the entire page displayed on the TV screen. The noise-less printer is activated by a single pushbutton, and an inverter allows the user to obtain either a negative or a positive print in 200-foot rolls (enough for about 300 prints). The paper can be handled just like ordinary paper, and the highly contrasted print can withstand even extreme light and temperature conditions with no alteration.

Alphanumerics and graphics are precisely reproduced, and colors and rendered by a range of grays, using a process patented by the CCETT and Telematique. For further information, contact, AVS, Inc., 1725 K Street, N.W., Washington, D.C. 20006, or call (202) 861-0020.

Evergreen Hydraulic and Electric Powered Stringing Ladders

The Evergreen ladder is available in two ladder models for the cable construction field, conventional and offset. The offset is 42" behind center, for stability and may be mounted on shorter truck wheel base.

Both ladders have three hydraulic power systems:

1. Power pack—powered by a 12 volt Prestolite motor and a Webster pump with an 8D-225 amp battery with a 130 amp alternator.
2. Clutch pump— driven by the truck crankshaft with 2 V-belts with a twelve volt electric clutch with a Muncie pump.
3. Power take off—powered by the truck transmission with a Muncie PTO and pump with cable controls.

For further information, contact Evergreen Equipment Co., 13588 S.E. 152nd, Clackamus, Oregon 97015.

Continental Lift Introduces CLC-32

At the NCTA 1980 convention, Continental Lift Corporation introduced its model CLC-32. Specifications include: locking tool boxes made of 14 gauge steel; work platform on nine gauge expanded steel; 360 degree continuous rotation; unit weight under 1,680 pounds; stowed height of eight feet, seven inches; round, moulded reinforced steel bucket with work tray; 300 pounds bucket capacity; 14 foot maximum side reach; electro-hydraulic power package consisting of 12 volt DC motor-driven hydraulic pump powered by two six DC volt batteries; maximum operating pressure of 1,550 PSI; and it meets ANSI and OSHA standards as interpreted by Continental Lift. For more input, contact Continental Lift Corporation, Highway 218 South, Austin, Minnesota 55912, (507) 433-7387.

Porta-Trailer—Heavy Duty Cable TV Trailer

This collapsible cable TV trailer is easy to transport from job to job. It is so collapsible that five trailers will fit in one pick-up bed or one trailer in the trunk of a regular size car.

The trailer is of very heavy steel to handle any size reels. It has a center post which makes it stronger so as to handle two large reels at one time or can be adjusted to handle one reel.

The new type brakes make it easy to adjust the tension of the cable reels and with the center post and two brakes you can adjust two reels with different tensions. The trailer comes with a ball coupler and painted orange. For further information, contact Clown Communication Co., 118 West State Street, PO Box 89, Paxton, Illinois 60957, (217) 379-4787.

The New 1810 from Ditch Witch

If your trenching needs call for a bit more than a handlebar machine, but not quite as much as a large riding unit, you can stop searching . . . the Ditch Witch 1810 meets you halfway.

As the smallest of their riding machines, this 18-HP-class trencher offers the convenience and campactness of a handlebar unit coupled with the handling and versatility of the much larger models. And in a cost versus payback challenge, it offers the labor and time saving returns of many bigger, higher-priced machines.

Comfort, efficiency, ease of maintenance . . . all of these and more were considered in the 1810's design. Low profile design and rigid one-piece frame provide greater unit strength and more stability; easily identified, conveniently located controls placed at operator's fingertips and grouped according to machine functions; two-way adjustable seat puts foot pedals within easy reach; operator position allows constant, unobstructed view of trenching operations for digging accuracy; and hinged, self-stowing hood allows immediate and total acess to engine and routine maintenance and inspection points. For further information, contact The Charles Machine Works, Inc., P.O. Box 66, Perry Oklahoma 73077.

Introducing the CableMate

The CableMate design system helps you save time and increase efficiency by automating the design and upgrade of your distribution system. Just key in the span length and type of tap desired, and the CableMate goes right to work. By automatically monitoring the line and informing you of the high and low end signal levels (dB) and the tap value required, it virtually eliminates manual calculations and spec-sheet lookups.

What's more, it knows when to insert line extenders and in-line equalizers plus the required value. Press two more keys and the bill-of-materials for constructing the system is printed.

The CableMate design system has heavy-duty capacity, capable of handling manufacturer's specs for 30 values of each type of hardware and 16 cable types—simultaneously. Or, you can compute an alternate design using another manufacturer's specs in minutes. Call your local Monroe Branch. Or write: Monroe, The Calculator Company, The American Road, Morris Plains, NJ 07950.

Dynatel 573 Simplifies Cable Fault Locating

Until now, finding CATV cables, faults and pre-wired outlets was an

inexact job at best. That's why 3M engineered a different instrument: the Dynatel 573.

3M's 573 is an all-weather field tool that makes it simple to positively pinpoint a CATV cable sheath fault. The controls are simple to use. The receiver's accurate red/green directional meter is easy-reading. The sturdy hand-held earth contact frame can be managed by anyone. In short, the 573 is as positive and fool-proof as it can be. The Dynatel 573 is supplied as a complete package including the transmitter/storage case; hand-held receiver; model 3001 dyna-coupler; transmitter cable; receiver/earth contact frame cable; earth contact frame and extension cable.

And, it's supplied complete with long-life batteries—ready to go! Just unpack it and put it to work. For further information, contact Dynatel Department, TelComm Products Division/3M, Post Office Box 60549, Sunnyvale, California 94088.

Mobile Unit Conversion Service Offered

The Video Equipment Corporation of America is offering van and other vehicle conversion services for the customized installation of ENG equipment. Some of the firm's previous customers have included Cox Cable Communications, Inc., Atlanta; Mobil-Color, San Diego; and the presidental campaign of Jose Lopez Portillo of Mexico. For further information, contact VEC of America, 7377 Convoy Ct., San Diego, California 92111, (714) 278-4400.

REDI-LINE Motor Generators

Battery-powered REDI-LINE Motor Generators provide a convenient, dependable 120 VAC (60 Hz) power source for a wide variety of uses. The exclusive, automatic start feature conserves battery power because the motor generator is controlled by the off-on switch of the power tool or appliance. The Model DA will power any motor, appliance or variable speed tool which relies on normal 120 VAC current.

The lightweight portability, convenience and dependability of REDI-LINE Motor Generators make them popular with contractors, farmers, ranchers, park maintenance men, equipment repairmen, recreational vehicle, boat and camper owners, commercial fishermen, locksmiths and paramedic teams.

Depending on whether you wish to use a 12, 24 or 36 VDC battery, there is a model DA to fit your needs. You connect the REDI-LINE units directly to a vehicle battery or battery pack. This eliminates long extension cords and the problem of voltage drop. The vehicle engine need not run while the motor generator is in use. The automatic start feature assures that the motor generator only runs when needed. No maintenance is required for at least 500 hours of operation. For further infor-

M.A.C. IS PROVIDING COMPLETE MICROWAVE TVRO EARTH STATIONS AT UNBELIEVABLY LOW PRICES.

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From site planning to system installation . . . M.A.C. now does it all in satellite TVRO earth stations. And we're doing it at prices so low even our customers have a hard time believing it.

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ANTENNAS—High efficiency with a precision fiberglass reflecting surface and a patented feed design giving +44.0 db gain. This antenna is designed to withstand the rigors of ice, wind and rough handling. It provides higher resistance to damage than metal antennas, and it has a simple, easy to install, low-cost mount and foundation.
LNA's—Reliability is the key to these precision-made amplifiers, and thousands of our performance-proven units are now in service.
RECEIVERS—A new breed of low-cost, *high* performance receivers. Modular in design and easy to service. The VR-3X is a manually tunable receiver which can be tuned across all 24 channels with just one screwdriver adjustment. The VR-4X has 24-channel frequency agile switchable tuning. Both are solid-state for dependable operation. Their modular system design provides many optional features including a built-in cable modulator, extra audio demodulators, and a 4.5 MHz subcarrier processor for insertion directly on to a microwave baseband.
PLUS frequency coordination, feed lines, pressurization, power dividers, construction and/or installation. All from **M**icrowave **A**ssociates **C**ommunications.

If you want to save big bucks on a first class VI-SAT TVRO installation, let us make a believer out of you. Call or write for full details today. Microwave Associates Communications, 63 Third Avenue, Burlington, MA 01803 (617) 272-3100.

Field Sales Offices: Atlanta, GA (404) 455-3815, Dallas, TX (214) 234-3522, Sunnyvale, CA (408) 734-8777, Minneapolis, MN (612) 831-3920, Englewood, CO (303) 779-6131, Sudbury, MA (617) 443-5139, Mississauga, Ontario (416) 625-8980.

Microwave Associates Communications
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mation, contact Honeywell Motor Products, P.O. Box 106, Rockford, IL 61105, or phone (815) 966-3600.

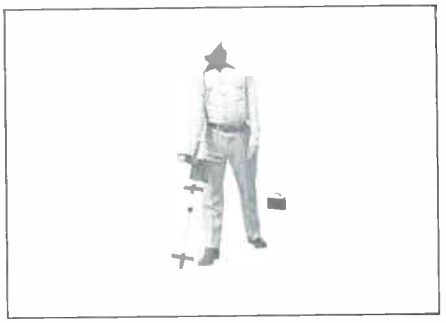
Character Generators from Video Precision

The CG3510 video display system by Video Precision provides a full 31 characters per line, 10 lines per page, display, using an upper case, larger character font. Line 1 is available for use as a one-line crawl message, or as a fixed title display, keyboard selectable. Lines 2 to 9 inclusive are for general message display, on a single or multi-page basis. Line 10 of the display provides time and temperature information, or can be left blank at customer option.

For further information, contact Kelcee Communications Ltd., 7171 Torbram Road, Unit 4, Mississauga, Ontario L4T 3W4, or call (416) 677-2232.

New Technology Provides Fast Accurate Tracing

The new Model 810 Line Tracer by Metrotech is designed for today's underground utility engineers, craftsmen, and contractors. It has everything you'll want from an electronic survey system for identification, tracing, and depth computation of all types of buried conductors in earth, cement, wood, etc., to a depth over ten feet.



The model 810 employs unique differential sensors in the telescoping probe. This allows fast, accurate tracing even in congested areas, and the operation is performed in a full standing position for greater safety and operator ease. Also the advanced circuitry entirely eliminates the task of gain or range controlling used by other systems. The 810 employs an automatic sensitivity control providing exact gain needed for tracing. For further information, contact Metrotech, 670 National Avenue, Mountain View, California, 94043, USA, Telephone (415) 965-9208.

Transportable Tower System Now Available

Advance Industries has announced what it calls "a significant breakthrough in tower systems." This newly-developed concept has proven in actual field erections, and in the laboratory as well, to be a solution to the need for a highly reliable, heavy-duty, quick erectable and transportable tower. Special high strength aluminum alloy legs have been utilized to yield an extremely high strength-to-weight ratio.

All sections are identical and stacked one on top of the other. Assembly starts by folding and bolting the flat sections into the triangular configuration. The lower end of each of the main vertical members inserts into the top casting of the section below it and is locked in place with an integral captivated bolt. For further information, contact Advance Industries, 2301 Bridgeport Drive., Sioux City, Iowa 51102, or call toll free (800) 831-0974.

The Harris Satellite Video Receiver.....Quiet Quality

Quietness is Important.

- A quality video receiver is silent and invisible, processing signals with no degradation. The sound and video fidelity of Harris Model 6522 Receiver is outstanding.
- A quality video receiver must reject noise. Under low signal conditions when pictures from other receivers break up, Harris Model 6522 delivers good video. Our tracking filter demod* makes the difference.

*Patent applied for.

- A quality video receiver must do its job without demanding attention. Install a Harris 6522 Receiver, then ignore it. You'll get reliability. If it fails (nothing is perfect forever), call our 24-hour telephone service number (305) 724-3000.

FEATURES:

Frequency agility, local or remote control; automatic polarization switching; dual conversion.

Planning an earth station? The Harris TVRO Earth Station Handbook is available on request.

HARRIS

COMMUNICATION AND INFORMATION PROCESSING

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transmission between the control center and headend is completed via two-way cable trunk amplifiers or a dedicated coaxial cable if remote operation is desired.

The "TotalControl" system is built around the computer, which addresses each decoder individually allowing the system operator to control any of 35 channels plus an on/off function, without entering the subscriber's home.

Basic system hardware is similar in many respects to Oak's Multi-Code converter/decoder system. Scrambled programming from the headend is processed by a set-top converter/decoder in the subscriber's home. The central computer, in conjunction with the "TotalControl" home converter/decoder, such as Oak's TC-35 shown in figure 2, determines which subscribers are authorized to decode which programs.

When a subscriber requests a specific program or level of programs, the information is entered into the computer. The appropriate authorization signal is sent to the central controller from the computer, which in turn sends the information to an FSK generator where serial data modulates a 104.75 MHz or 112.7 MHz signal for suitable transmission over the cable system. Total bandwidth for the data channel is ±400 KHz including guardband.

Once activated by the control system, the data channel enters the subscriber's addressable converter/decoder, via the cable distribution equipment at a recommended level of 15 dB below the channel 6 video carrier. This signal is compared with the decoder's unique address at the subscriber's location, and if a match is made, the subscriber will receive selected programming. If a match is not made, programming remains scrambled.

The authorization signal corresponds to one of eight program levels (such as sports, specials, feature movies) or in some cases, a particular program.

Each rf cable channel carrying a controlled program is tagged with a program level identification signal. This is done by encoding data on the audio if carrier during the vertical interval suppression period.

As the subscriber selects a given channel, his converter/decoder unit compares the tagging signal on the channel with the addressing signal stored in its latching circuit. If the two signals match, a decode function will occur.

If a subscriber's equipment is stolen or the subscription account becomes delinquent, the converter/decoder can be disabled remotely by changing the addressing signal to deny the services.

To further deter more elaborate schemes to steal controlled programming, Oak's TC-35 set-top unit is designed so that data must be continually received for the unit to continue decoding. If the addressing signal is not received the unit will automatically time-out. The logic circuit is enclosed in epoxy, which prevents the subscriber from tampering with it or change his authorization code to receive programming illegally.

The tagging technique used in conjunction with the TC-35 does not require dedicated rf channels. If a cable operator wishes to tag all 35 channels on his system, he can duplicate one or more program level signals on multiple rf channels. For example:

12 channels tagged with code #1—
Basic Service
4 channels tagged with code #2—
Sports

4 channels tagged with code #3—R-Rated
3 channels tagged with code #4—G.P.
3 channels tagged with code #5—Specials
3 channels tagged with code #6—Ethnic
3 channels tagged with code #7—Local Origination
3 channels tagged with code #8—Professional

"Flexibility is the key to TotalControl, and the addressable system," Johnson said. Changes in the system can be made easily, whether it is a change in subscriber authorized viewing, disconnect or reconnect. Each requires only a CRT entry to the computer. (The operator can change the structure of his service in the same manner.)

"Capacity presents no problems," Johnson says, "because the computer can control up to 150,000 subscribers at any one cable system site—far more than a single system would ever use."

"Looking into the future possibilities of addressable systems is probably the most exciting aspect," Johnson continued. "In the near future, 'TotalControl' Videotext will be incorporated into the Oak addressable concept." Videotext is a broad information base transmission technique that can be used by the cable operator without giving up any existing channels. The information is transmitted on two lines in an unused portion of the vertical blanking interval.

Videotext information is generally defined as a constant stream of coded information from which subscribers can program home terminals to receive particular items of interest. The system is capable of delivering unlimited pages of information at any given time, and may truly be called the newspaper of tomorrow.

"Videotext, now in final engineering development at Oak CATV, will offer an almost limitless range of information, including fast-breaking news, traffic reports, airline schedules, stock market quotations and money market rates, weather alerts, telephone directories of major cities, entertainment and sports schedules, mail-order goods, or first aid information and emergency phone numbers."

Graphic displays using lines or groups of alpha-numeric characters also can be presented to further explain information or illustrate announcements, etc.

"Interactive communication is another exciting concept available through cable technology and addressability," explained Johnson. "The 'TotalControl' system as it exists today will be compatible with interactive two-way communication."

The interactive technique Oak is pursuing will allow the subscriber to communicate with the computer at the headend. This obviously will involve two-way capability over the trunk distribution cable.

Advantages of two-way communication combined with addressability include burglar and fire protection, medical emergency coverage, energy management systems, interactive video games, computer data and programs and private municipal video services, to name a few, Johnson said. We can even foresee voting via the cable system.

"New opportunities for maximum use of cable technology will develop as we move ahead," he said, "and each time we reach a plateau, the drawing board will contain something new to challenge our imagination." **C-ED**

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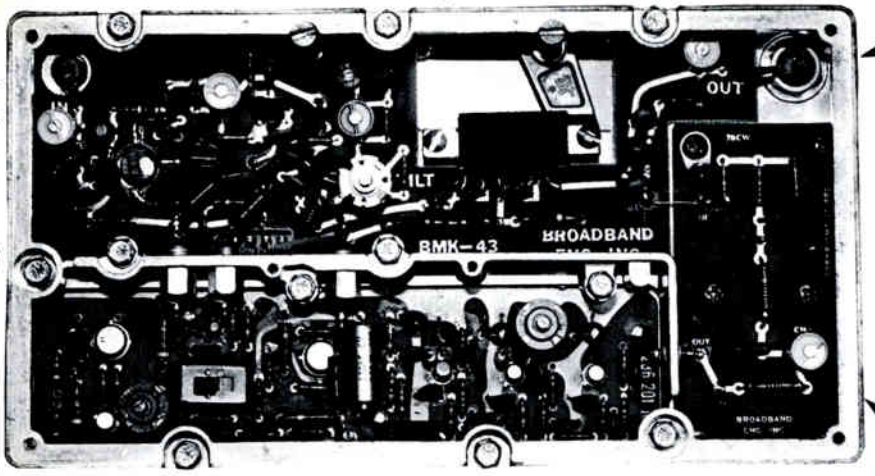

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Direct Reception: The New Frontier

Mr. Hopengarten, an attorney, is President of Channel One, Inc., a Lincoln, Massachusetts, company specializing in direct reception.

by Fred Hopengarten, Esq.

Late at night, in flights of fancy, cable TV folks like to talk about the day when half the country will be cabled. That is well and good. It will bring entertainment programming to a great many families. But what of the other half of the population?

There will always be a significant population living in areas that are uncabled. It may be an area of single family homes where the density of population does not justify the extension of the cable. It may be a resort community or condo village in an isolated spot. It may be the motel which wishes to offer programming not available on the local cable system. For whatever reasons, a new category of satellite TV programming user is arising. For some people, direct reception is the only alternative.

The Legalities

There are principally two laws governing this area of discussion. They are the Communications Act of 1934 (47 USC §605) and the Copyright Act of 1976 (17 USC §106). Neither one prohibits direct reception by private viewers.

The Communications Act. For the full text of the statute, see Figure 1. In relevant part, however, it reads:

> . . . no person receiving . . . shall divulge or publish. . . . No person not being authorized . . . shall intercept . . . and divulge or publish . . . No person not being entitled thereto shall receive . . . and use . . . No person having received . . . shall divulge or publish . . .

The statute says that it is illegal to receive and publish or use. Mere passive reception is legal. Congress correctly recognized that government has no business watching over individuals as they tune the RF spectrum.

The Copyright Law. All the rights of a copyright holder are listed in Section 106: "Exclusive rights in copyrighted works." The full text is shown in Figure 2. The rest of the statute is made up of limitations on the breadth of a copyright holder's rights.

Basically, the copyright holder has the exclusive rights:

1. to reproduce the copyrighted work . . .;
2. to prepare deprivative works . . .;
3. to distribute copies . . .;
4. . . . to perform the copyrighted work publicly; and
5. . . . to display the copyrighted work publicly.

Note the verbs: to reproduce, to prepare, to distribute, to perform, and to display. The passive concepts of receiving, watching, and viewing are omitted. The *Sony* Case, in which a California court held that videotape recording in the home is not covered by the copyright statute, offers guidance here.

For mere passive viewing in the home, without publication, use, or distribution of the programming, there are no prohibitions. How would you enforce a prohibition anyway? Will Time-Life, owners of HBO, invade the privacy of your home to see whether you have tuned in Transponder 8 (CBN), or Transponder 22 (HBO)?

In my opinion, cable TV programmers, and local cable affiliates, have no grounds for intervention until satellite signals received in a private home leave that home, either on tape, by relay over-the-air, or in a coaxial cable.

Options Open to Programmers

Scrambling

The most obvious method for frustrating private viewers is to scramble a signal. Oak has even tested one method on the Westar satellite.

There are several problems with scrambling:

- It costs money. Who will pay these costs? The programmer? The cable operator? Ultimately, we know that the innocent cable subscriber will pay for scrambling.
- Scrambling decreases system reliability. No matter the figures used, a predictable percentage of systems will suffer failures in their descrambling equipment each year. Hundreds of thousands of subscribers will be affected by an effort to frustrate a tiny minority of private satellite receiving systems.
- Scrambling invites descrambling. The same individuals who are clever enough, or rich enough to assemble a complete satellite TV reception system, will soon develop capabilities for dealing with anything less than a military-style electronic camouflage.

Advertising

ESPN, WTBS, and WOR, can hardly be blamed for their lack of enthusiasm for combating unauthorized reception and use of satellite TV signals. After all, they receive little in fees from cable operators, and a great deal in fees from advertisers who want the word spread to a wider population.

Reasonable Rates

Home Box Office will not negotiate with private users at

all. To keep affiliates happy, other programmers, such as Warner Amex, charge more for individual TVRO subscribers than for cable subscribers. If programmers were to establish inexpensive rates (comparable to what they now charge for reception through cable systems) and procedures as simple as magazine subscriptions (perhaps offering a program guide), then many private terminal users would simply pay to avoid controversy.

Do Nothing

Frankly, despite a great deal of hoo-ha, it is widely expected that the most common response to private terminals will be no action at all. Scrambling makes no sense on a cost/benefit basis, the increased rate base for advertising will be insignificant, and collecting fees when no statute requires it may prove difficult. At 4 Gigahertz, the number of private earth stations will always be tiny, when compared to the number of cable TV subscribers.

Limitations on Back Yard Terminals

Forget the hullabaloo now seen in hobbyist electronics journals. The potential for home earth stations is severely limited. Cable operators who have installed their own earth stations will recognize the difficulties that can crop up:

- Some terrain may be in the way. Moving the dish may get around a building, and a platform may permit a view over the trees, but you cannot deal with a ridge or mountain that gets in the way.
- The number of cable homes passed acts as a brake on the growth of private earth terminals. How many families will pay $16,500 for entertainment that can be bought for $16.50 a month?
- Some city zoning ordinances make the erection of a ten, twelve, or sixteen foot diameter parabolic dish almost impossible.
- The cost of systems, even if they should someday be halved, will still make this luxury item beyond the reach of the great majority of Americans. In these times of economic hardship, who has $16,500 to spare?
- Private reception is not simple. There is a certain element of complexity to the process. An element of electronics sophistication is required to cope with hardware salesmen.
- The average roof will not hold a dish. Ten, twelve, and sixteen foot dishes look like big sails in the wind. The typical home roof, designed to keep out the wind and rain, may blow off—or fall in—before the wind dies down.
- Home use does not make interference from terrestrial microwave links any less significant. In fact, while most cable operators have the option of relocating the head-end, few homeowners will move just to watch television.

Programmers would be wise to recognize that there are two types of direct reception terminals: private homes and multiple user MATV systems. Programmers should ignore the former and cater to the latter.

Direct Reception MATV: A New Crowd of Paying Customers

Condominiums and Apartment Complexes

FCC regulations (47 CFR §76.5(a)) specifically exempt

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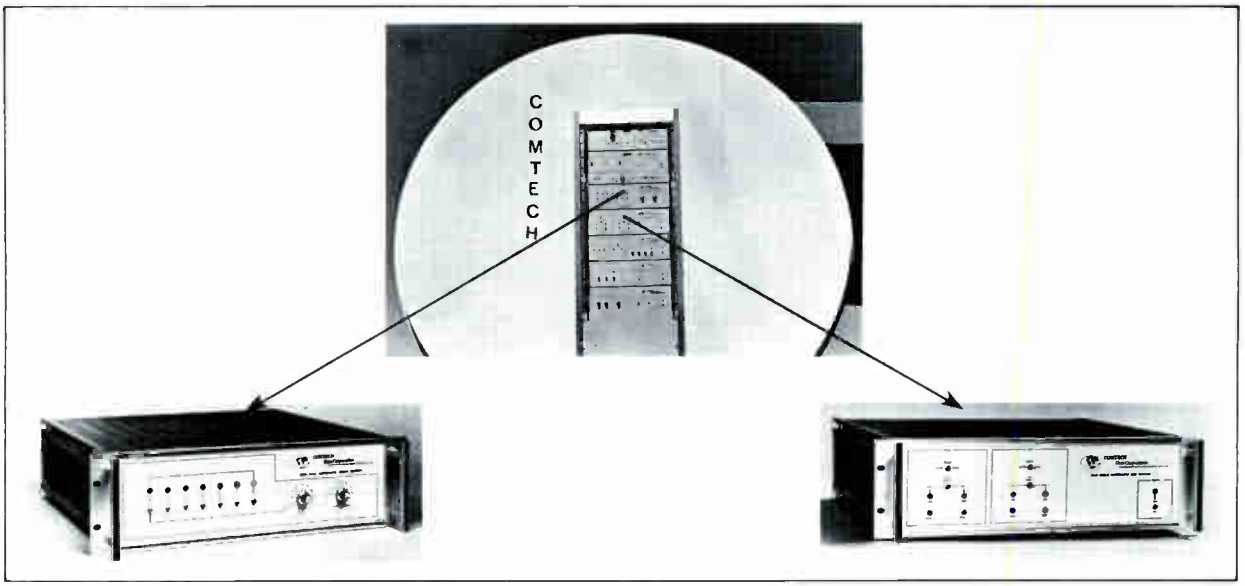

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from the definition of a cable TV system "(1) any. . . facility that serves fewer than 50 subscribers, or (2) any. . . facility that serves or will serve only subscribers in one or more multiple unit dwellings under common ownership control, or management." MATV systems serving apartments and condominiums—and motels as will be mentioned later—are not controlled by the Federal Communications Commission. In addition, they are not burdened by the expense and effort of maintaining plant and equipment to carry signals from house to house. For this reason, and because many such complexes exist in areas which are not cabled, MATV systems will offer a new market to hardware suppliers (for earth stations) and programmers (for monthly subscribers).

Programming Fees

A signal distributed throughout a building or complex is no longer mere passive reception, nor is it within the "fair use" protection of the copyright laws. Programming fees will be due to those programmers which charge them.

CBN, TBN, PTL, SPN, and Modern Satellite Network programs are free but there is some charge for all other services. Of course, the amount owed would be the "wholesale" rate, because there is no cable operator to "retail" the signals. The condo management or apartment owner may decide to accept mark-up. Cable operators and entrepreneurs are now moving towards the establishment of "mini-cable" systems in these MATV situations. The problem is that some programmers, HBO and Madison Square Garden Sports among them, decline to do business with MATV systems. Apparently, this sense of loyalty to the cable industry is engendered by either a fear of backlash from cable operators, or a lack of imagination in the marketing and legal departments. No other reasons have been articulated.

Motels

The same hardware considerations that are appropriate for condominiums and apartment complexes pertain to motels. Here again, HBO is balking at direct reception contracts. The Movie Channel is available at $3.75 per room per month, with Showtime asking about $4.25.

There are some restrictions. Motel operators can have a "movie wing," where all rooms have an extra charge, but cannot tack on a nightly charge (say, $2, if the guest chooses satellite TV). Additionally, the movie services are quick to emphasize that their programming cannot be shown in the lounge.

Bars

None of the five movie services (HBO, The Movie Channel, Showtime, HTN, or Take 2) will permit the showing of a movie in a lounge or bar, even where associated with a motel in which their programming is shown in the rooms. This is apparently connected to the inability to control the gate and reflects the contracts that those programmers have, in turn, with the movie providers. Apparently, a few special deals have been done with Air Force bases and the like, but that is all.

Nonetheless, ESPN will permit display of its programming in a lounge for a one-time, life-time fee of $500. Assuming a $15,500 hardware cost, this means that a bar could display ESPN nightly for a period of seven years for a cost of only $6.65, before depreciation and investment tax credit. Of course, the quality of the satellite signal will be superior to

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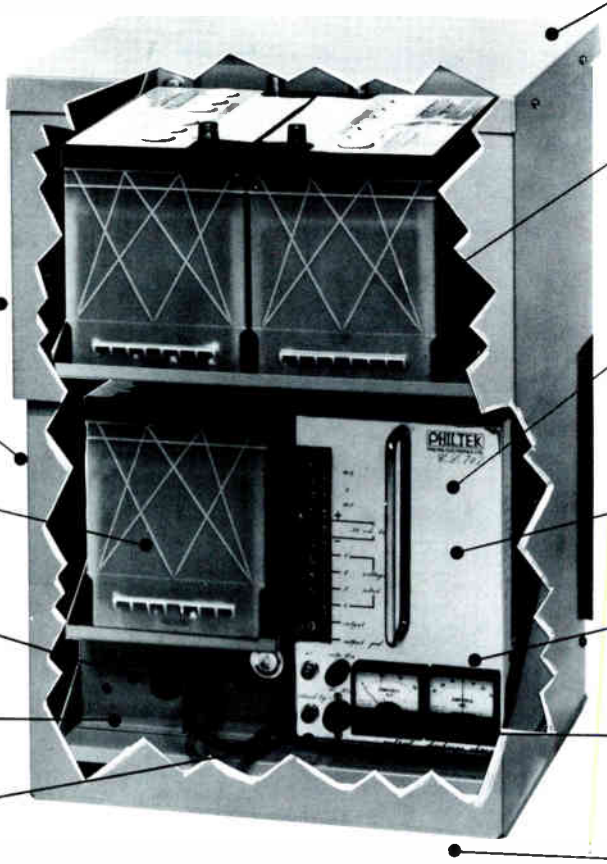

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over-the-air reception now displayed on a bar wide-screen TV set. For even a modest-sized room, this means that selling a single extra round of drinks per night because of the TV entertainment provided by ESPN will more than pay for the equipment. It is hard to understand why Madison Square Garden Sports declines to permit the use of the signal for these purposes.

New Frontiers

Homes, condominiums, and bars represent the logical expansion into populations not now served by cable TV. Any attempt to prevent home reception will have a negative effect on the potential for spreading services to condos and bars. Since home users will always represent a tiny fraction of the total population served, it seems illogical that such great attention should be paid to frustrating their reception.

Time, effort, and money would be better spent in promoting satellite TV programming services to the paying customers: condominiums, apartment complexes, motels, and bars. New tariffs should be filed. New contracts should be written with program providers.

Direct reception MATV is the next big market. **C-ED**

Figure 1

47 USC §605 — Unauthorized publication or use of communications

Except as authorized by chapter 119, Title 18, no person receiving, assisting in receiving, transmitting, or assisting in transmitting, any interstate or foreign communication by wire or radio shall divulge or publish the existence, contents, substance, purport, effect, or meaning thereof, except through authorized channels of transmission or reception, (1) to any person other than the addressee, his agent, or attorney, (2) to a person employed or authorized to forward such communication to its destination, (3) to proper accounting or distributing officers of the various communicating centers over which the communication may be passed, (4) to a master of a ship under whom he is serving, (5) in response to a subpoena issued by a court of competent jurisdiction, or (6) on demand of other lawful authority. No person not being authorized by the sender shall intercept any radio communication and divulge or publish the existence, contents, substance, purport, effect, or meaning of such intercepted communication to any person. No person not being entitled thereto shall receive or assist in receiving any interstate or foreign communication by radio and use such communication (or any information therein contained) for his own benefit or for the benefit of another not entitled thereto. No person having received any intercepted radio communication or having become acquainted with the contents, substance, purport, effect, or meaning of such communication (or any part thereof) knowing that such communication was intercepted, shall divulge or publish the existence, contents, substance, purport, effect, or meaning of such communication (or any part thereof) or use such communication (or any information therein contained) for his own benefit or for the benefit of another not entitled thereto. This section shall not apply to the receiving, divulging, publishing, or utilizing the contents of any radio communication which is broadcast or transmitted by amateurs or others for the use of the general public, or which relates to ships in distress. As amended June 19, 1968, Pub.L. 90-351, Title III, §803,82 Stat. 223.

Figure 2

17 USC §106—Exclusive rights in copyrighted works

Subject to sections 107 through 118, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:

1. to reproduce the copyrighted work in copies or phonorecords;
2. to prepare derivative works based upon the copyrighted work;
3. to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;
4. in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly; and
5. in the case of literary, musical, dramatic, and choreographic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly.

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So they either get the *whole* picture they paid for, or *none at all.* In fact, there is no security system that can deliver a clearer picture.

VITEK's on-the-pole, single-channel, negative traps have established their superiority over other types of security devices in long-term stability and reliability. You get the same cable configuration, construction features and reliability with our Multi-Channel Traps.

And now the Best Pay-TV Security Devices may also be the least expensive means of securing premium channels.

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According to the latest figures* (Paul Kagan), average pay penetration of houses passed has increased from 15% to **19.9%** and average pay penetration of basic subscribers has increased from 31% to **37.7%**... in just 12 months from June '78 thru June '79.

Basic/Pay Combination Trend

Cable operators constructing new systems in major markets are offering basic and pay services in combination from the very start, and in more and more instances are offering multi-pay/multi-tiered service as well.

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*June 30, 1979 edition of Paul Kagan Associates *Pay TV Census.*

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SALES APPLICATION ENGINEERS
CATV Test Equipment

Leading manufacturer of CATV test equipment has immediate openings in the sales department for regional sales application engineers. Excellent opportunity exists for an individual who enjoys a challenge. BEE or equivalent required. Minimum of three years experience in the technical end of CATV system operation. Microwave, earth station, and digital knowledge would be beneficial. Prior sales experience desireable but not mandatory. Extensive travel involved.

Send resume or call collect:

WAVETEK
Indiana CATV Division
66 North First Ave.
Beech Grove, Indiana 46107
(317) 783-3221

SYSTEM ENGINEER-CHIEF TECHNICIAN

Dynamic, growing MSO requires personnel in senior technical operations positions in Virginia and New York state.

Applicants should have 3-7 years experience with a background in headend, design, maintenance and some supervisory responsibility. A BSC in engineering, 2 years technological degree or equivalent experience/course training is required. Salary based on the position and the candidate. Vacation, auto, health care, moving and education packages included.

Send resume in confidence to:

W.A. Devereaux
VP/Engineering
American Cablesystems Corp.
27 State St.
Boston, MA 02109
(617) 227-9105

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Cable Atlanta, Incorporated

Cable Atlanta, Inc., is presently constructing 1600 miles of plant in the Atlanta metropolitan area and is in need of an Outside Plant Supervisor.

OUTSIDE PLANT SUPERVISOR
The Outside Plant Supervisor will initially be responsible for the technical aspects of the outside plant portion of the system. This includes material proofing, system activation, FCC Proof of Performance, personnel training and technical department administration. This professional must be able to administer the construction and design of the outside plant. Ability to rapidly advance to Outside Plant Manager is mandatory. Resumes with salary requirements should be submitted to:

Mr. Ron Bird
1231-A Collier Road
Atlanta, Georgia 30318

All qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

OPERATIONS MANAGER-STV

Opening for an experienced individual to assist in design, start-up and day-to-day management of installations, service and warehousing. Operations and technical experience in cable, MDS or STV required. Northeast location. Competitive salary and excellent benefit package. Reply in confidence to Box C-ED 0780-2.

SYSTEM ENGINEER
CHIEF TECHNICIAN
MAINTENANCE TECHNICIAN

Experienced personnel of all levels required for new builds in Massachusetts, New York and Virginia. Resumes should be sent in confidence to W.A. Devereaux, VP/Engineering, American Cablesystems Corp., 27 State St., Boston, MA 02109.

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FIELD ENGINEERS

Continental Cablevision, a rapidly expanding MSO now has openings in the St. Louis area for qualified field engineers. Must have a good working knowledge of headend, earth station, baseband video, system design and proofing. Minimum 2nd class FCC license required.
Send resume and salary history to:

Michael Cowley
Continental Cablevision of St. Louis County, Inc.
7733 Forsyth, Suite 2162
Clayton, MO 63105

CHIEF ENGINEER

A major MSO is seeking a Chief Engineer with strong technical and administrative skills for a system located in the metro New York area.

The system has 300 miles of active two-way plant and an additional 600 miles under construction. A move to this system represents an excellent choice for the experienced chief desirous of meeting the challenges of two-way and digital transmissions with an industry leader.

Salary commensurate with experience. Send resume to Box C-ED 0780-1.

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OF CABLE TV PLANT

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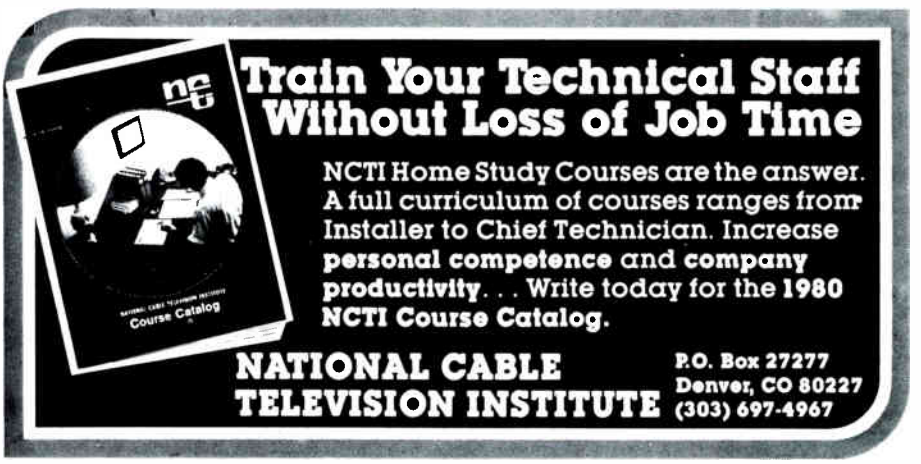

Business Directory

Miscellaneous

Ad Index

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The first antenna to put it all together.

Never before has anyone combined all these features in one antenna:

ALL PARTS 100% INTERCHANGEABLE
Interchangeable segments automatically self align. No special tools needed to erect.

REDUCED WEIGHT
10 foot dish weighs only 140 lbs. Shipping volume under 60 cubic feet. Means big savings on shipping costs.

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For example the ten footer's 8 petals weigh under 15 lbs. each. No cranes needed. Send the antennas up by elevator or the stairs!

A NEW GENERATION OF PRECISION MOLDED SEGMENTED, LIGHTWEIGHT, FIBERGLASS ANTENNAS.
Tough, resilient, "forgives" rough handling. Available in sizes from 4 foot to 5 meters.

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- Prodelin textured front surface diffuses solar heating.
- Unpressurized feed.
- Enclosed focal point LNA with polarization from the rear of the antenna.
- Plane and dual polarized antennas are available, all of which meet appropriate FCC requirements.
- Available in environmentally acceptable tones of green, white, tan.
- Self indexing flanges (Prodelin exclusive) eliminate guide pins, add to simplicity.
- Interchangeable fiberglass segments have their own inherent strength (unlike fragile aluminum segments).
- Antenna sheds ice so easily in most locations, it's considered virtually self-deicing. If ice does form it can be manually deiced with the rap of a mallet.
- Patent applied for.

The Associated Press, The Mutual Broadcasting System, Muzak and other major networks in the U.S. and abroad use Prodelin antennas in their Earth Station systems. Major land links also employ Prodelin antennas. Read all the reasons why. Send for new segmented antenna literature.

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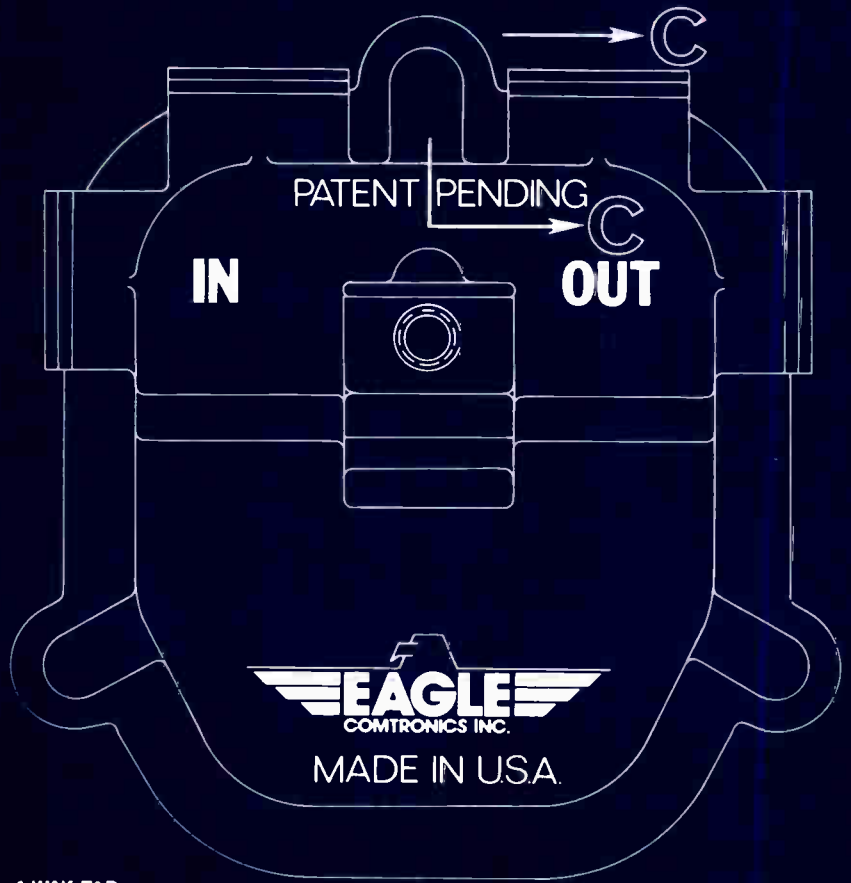

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VALUE	8	11	14	17	20	23	26	29	32	35
MODEL	EC4-408	EC4-411	EC4-414	EC4-417	EC4-420	EC4-423	EC4-426	EC4-429	EC4-432	EC4-435
COLOR CODE	orange	gold	white	black	green	purple	yellow	red	silver	blue
TAP LOSS										
INSERTION LOSS										
5 MHz		2.2	1.2	.5	.4	.3	.2	.2	.2	.2
300 MHz		2.7	1.4	.7	.5	.4	.3	.3	.3	.3
400 MHz		3.1	1.6	.8	.6	.5	.3	.3	.3	.3
450 MHz		3.2	1.7	.9	.7	.6	.4	.4	.4	.4
ISOLATION - out to tap										
5 MHz		30	32	34	40	43	46	49	52	55
300 MHz		30	32	34	38	41	44	47	50	53
400 MHz		28	30	32	35	38	41	44	47	50
Tap to Tap 5-400 MHz 30DB Min										
RETURN LOSS - In Out Tap 5-400 MHz 20DB Min										

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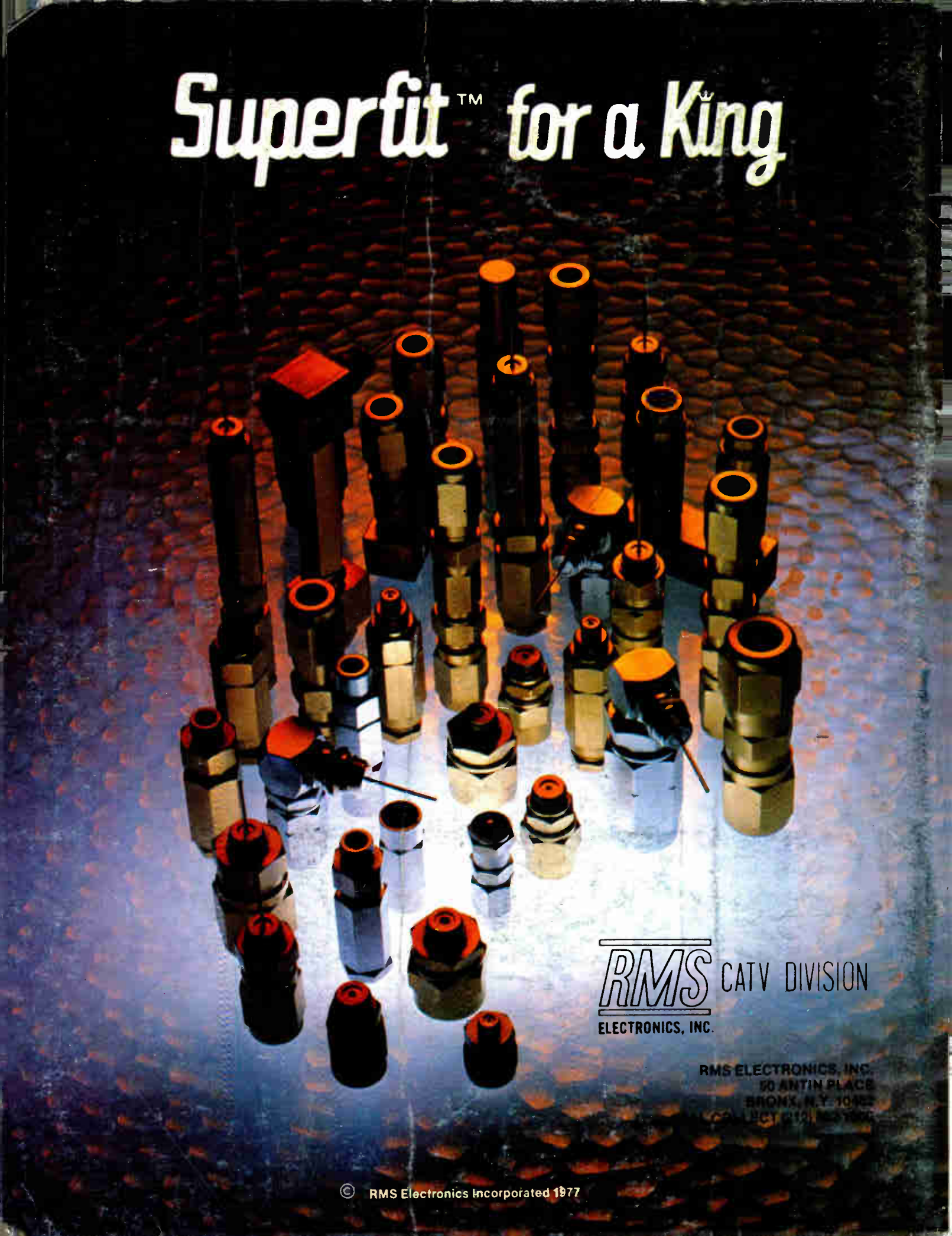

RMS CATV DIVISION
ELECTRONICS, INC.

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