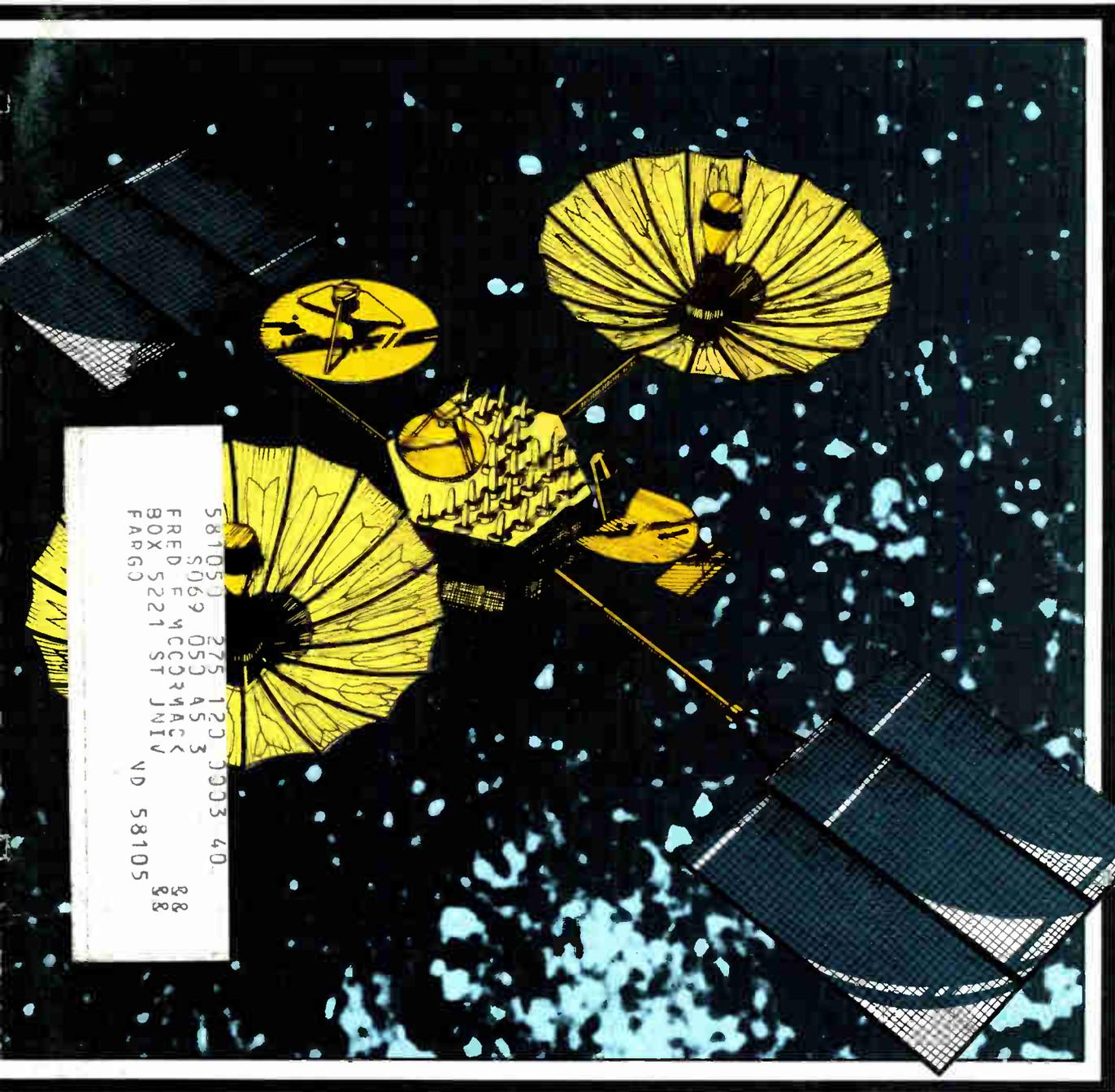


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88

A man in a dark suit and red tie stands in a warehouse or office setting, holding a large red folder and a black electronic device. He is looking directly at the camera. In the background, there are shelves and boxes. In the foreground, there are cardboard boxes with the 'OAK' logo.

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Expansion  
the painless  
way.”**

**“Oak gives you the facts in this free report.”**

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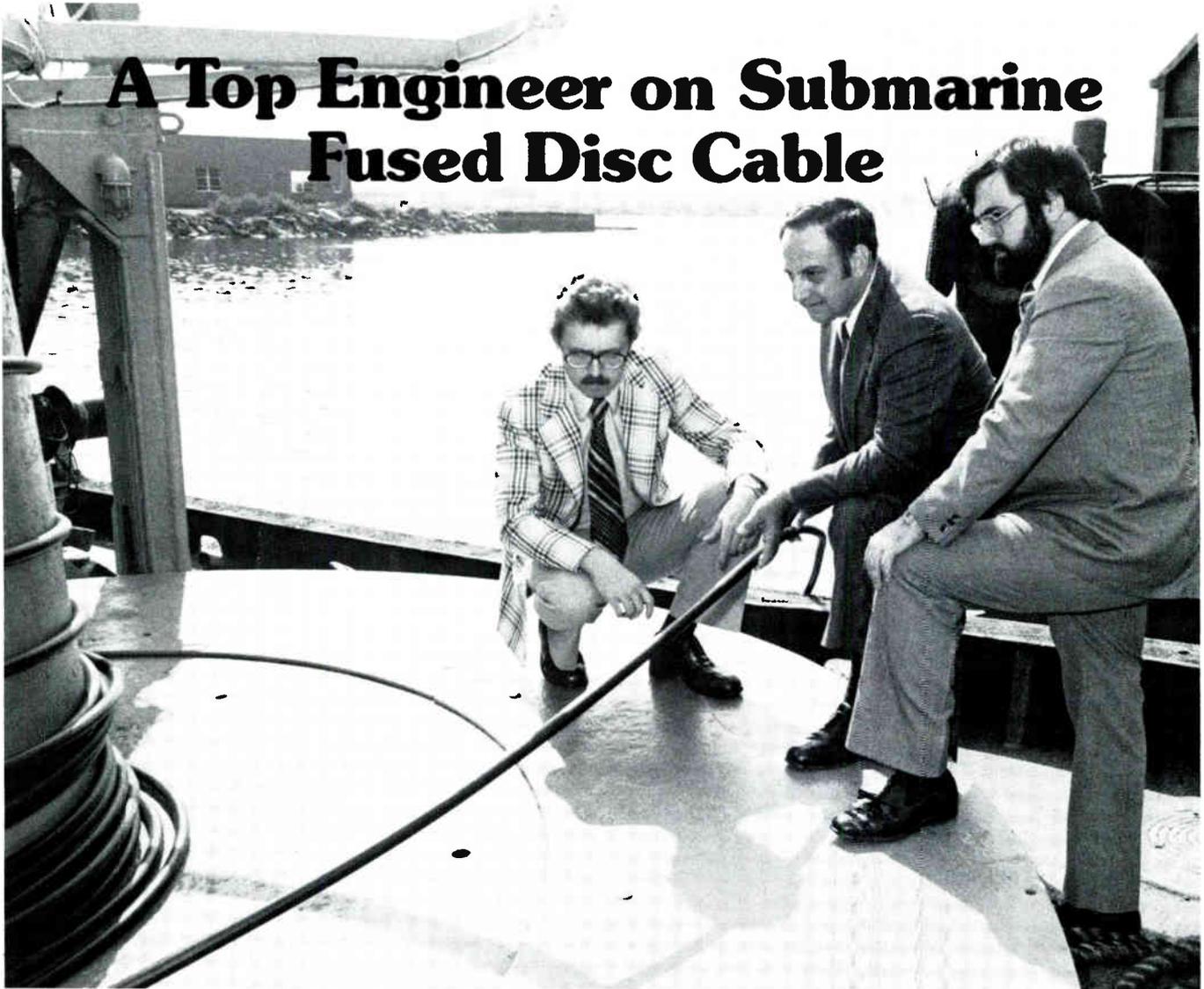
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*"Your cable design incorporating helically applied round copper wires under the jacket provides an excellent optimization of these criteria and results so far have been highly satisfactory.*

*"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."*

Whether you're going in the ground, up in the air or under water, General Cable can provide a Fused Disc III cable construction ideally suited to your installation. Write or phone us for an information package.

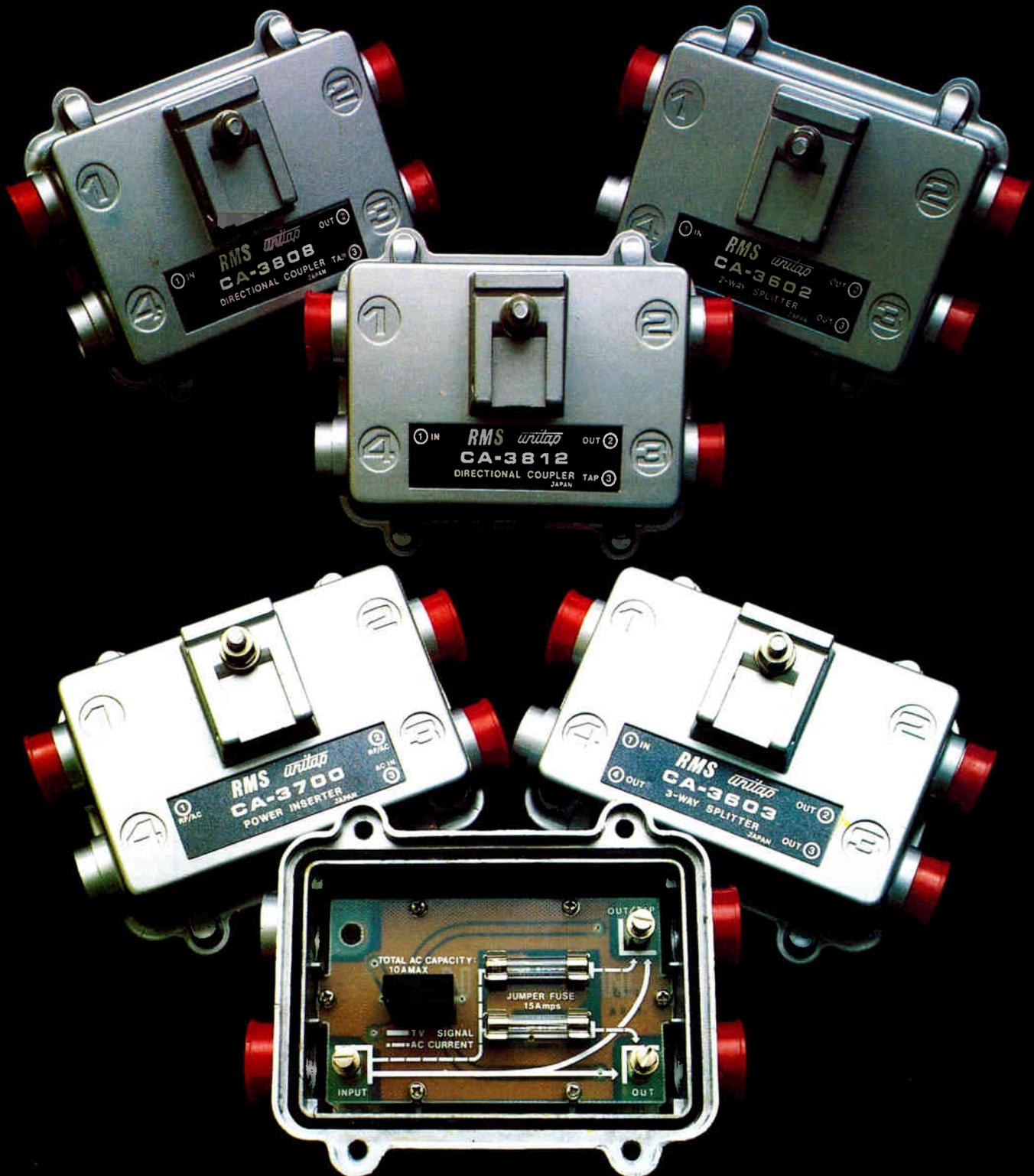
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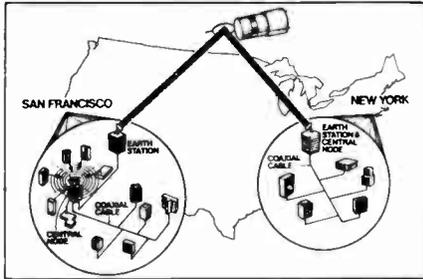
# C-ED News at a Glance

WASHINGTON, D.C.—**The FCC has waived its cross-ownership rules to permit Concord Telephone Exchange, Inc., to furnish cable television services through its affiliate, Concord Cable Communications Company, throughout its service area at Concord, Tennessee.** In February 1979, the Knox County Board of Commissioners selected Concord over Athena Cablevision Corporation of Knoxville and Tennessee-Kentucky Cable Company, Inc., to award a non-exclusive franchise. The FCC noted that the density would be less than 30 route homes per mile and that Concord Cable's opponents had not shown they were prepared to institute service essentially as proposed by the telephone company which, it said, was a matter totally within the discretion of the local governing body. Meanwhile, a flood of telco activity is not expected to take place even though the FCC is beginning to clarify its waiver standards. As part of its economic controls initiated during the last two months, the White House has reportedly axed the major funding programs for broadband services being administered by REA.

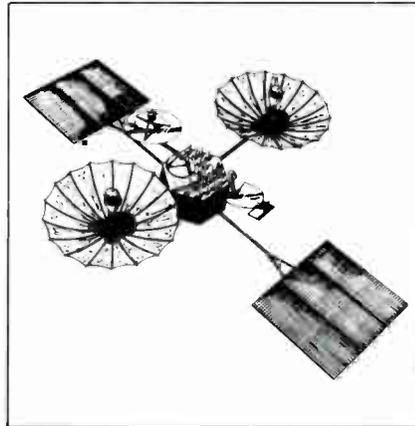
WASHINGTON, D.C.—**The FCC has once again decided not to require cable television systems to carry the scrambled programming of local STV stations.** Blonder-Tongue, and others petitioning the commission, claimed cable carriage of STV signals was critical to the effective integration of STV into the total television system and that carriage would benefit viewers by contributing to the support of the STV stations while providing additional diversity for the viewers. The FCC said there was no evidence that whatever financial difficulty some STV operators might be having was related to the failure of cable systems to carry scrambled signals.

WASHINGTON, D.C.—**The Communications Satellite Corporation (Comsat) which recently saw its direct satellite-to-home pay venture with Sears fall through, is now under close scrutiny by the FCC.** The commission has adopted a Report to Congress in which it examines the consequences of Comsat's increasing diversification into business not directly related to its Intelsat and Inmarsat operations. **As a result of its findings, the FCC is now considering initiating a rulemaking which would require Comsat to form separate corporate entities for its competitive businesses of domestic satellite service, product marketing and sales, and technical and other consulting services.**

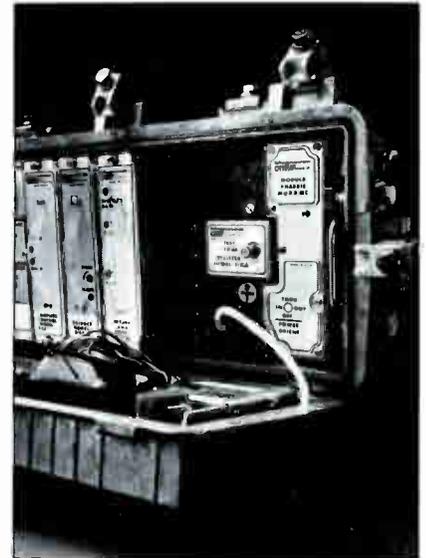
WASHINGTON, D.C.—Following a consent decree signed by a Federal Judge in Atlanta, Georgia, two months ago, **the FCC's Common Carrier Bureau has granted temporary authority to Southern Satellite Systems, Inc., and RCA Americom for a transponder to be leased to Ted Turner's 24-hour Cable News Network (CNN).** The action did not deal with the complaints against RCA Americom filed by Spanish International Network and Eastern Microwave, Inc. They, along with the National Christian Network, filed petitions to deny the uplink and transponder authority that are pending. The bureau said there is considerable controversy surrounding the manner in which CNN got the transponder, but the Communications Act does not require resolution of that controversy in the context of its provisions for authorization of a channel. HBO is also challenging RCA's switch to a lottery method for assigning transponders and has filed a complaint about the carrier's new tariffs which have no provision for deducting termination fees that could be charged to someone else.



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**Cover:** One of the satellites to be used in Western Union's advanced WESTAR system.

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**Editor's Letter**

The NCTA convention is at hand, and for this our pre-convention issue, C-ED presents a focus on Ken Gunter and the NCTA's Engineering Committee. As Gunter has explained, one purpose of the committee is to facilitate the preparation of responses to FCC notices of proposed rulemaking. One problem here, according to Gunter, is that when requests from the NCTA go out for comments on different proceedings, there are very few responses that come back from the industry as a whole. And, says Gunter, it seems to be the same people time after time who respond to the NCTA's call for comments. At one point, Gunter noted, "It shouldn't be that way. The whole industry is affected, and to the same degree, by any impractical technical requirements. So everyone should be filing comments and participating in the commission proceedings. And if they can't go through the entire formal filing process, either because of staff or budgetary limitations, they should at least send informal notes or outlines or even make a telephone call or two, so that there will be a stronger indication of industry-wide participation. In other areas, after all, such as broadcasting, common carrier, and satellite, there are few technical proposals that do not provoke a fairly massive response. I'd simply like to see the same level of participation within the cable industry."

We agree with Gunter. The future of broadband technology is intimately linked to the regulatory provisions—both passed and proposed—relating to it. There must be a concerted effort by engineers and technicians to increase the degree of their participation in the regulatory process.

Otherwise, the dream of an entire country joined together with coaxial cable could remain just that—a dream.

*Paul A. FitzPatrick*

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# New Products, New Developments for the SCTE

**A** conversation with Judith Baer, Executive Vice President of the Society of Cable Television Engineers. **C-ED:** Judy, perhaps we could start with a question about the SCTE's National Scholarship Program. Could you give us an update on the status of that effort?

**Baer:** Sure. In the first place, though, I noted something in the last issue of the magazine which I feel really needs to be clarified. It's important to state that the proposal to begin that program in cooperation with all the state associations and hand out 150 scholarships a year and so forth is just that: a proposal that was developed by the staff. It has not been approved by the board of directors. Certainly we're keeping our fingers crossed and hoping that it will be approved—in fact, the chances are very good that it will be approved. But, still, it was only a proposal. Beyond that, the whole thing seems to be catching on really fast. Bob Bilodeau called me yesterday and told me that he was sending down \$500 for the scholarship fund.

One other thing that I'm impressed with, and very pleased with, is that in the May 19th issue of Time magazine, in the Dallas/Ft. Worth metroplex edition, with a readership of approximately 2 million people, there will be a full-page ad from SCTE talking about making career contacts. To expose the career potential of cable television to people outside the industry. This is the first of a number of ads that we will be placing in national publications. And it has all been made possible because of funding of our manpower development fund, the purpose of which is to allow us to develop a national recruiting campaign. This will include advertising, and an eight panel brochure which will be released in late summer so that it gets into vocational and trade schools, colleges and universities in the fall.

**C-ED:** Last week you and your staff were editing videotape. What was the subject matter of those tapes, and when will they be available for distribu-

tion?

**Baer:** Well, there are ten videotapes. There is a classroom session on pole climbing; and another one which is a field demonstration on pole climbing. CATV Signal level meter basics; signal level meter errors and inaccuracies; video test signals; video wave-form measurements; high-frequency RF sweep generator basics; RF sweep generator applications, with a mini-system as a demonstration; CATV converter repair procedures; multi-channel cable converter alignment; an audio tape on manpower training and recruiting; and a fifty-six page text on teletext and viewdata. That's the edited transcript, with the graphics, from the conference in February. The membership will receive notice of all these products very shortly in the mail.

**C-ED:** How soon will these be available for distribution?

**Baer:** They're available immediately. We can ship three weeks after we receive a paid order. The tapes are finished; the masters are in our hands; it's all done.

**C-ED:** How much will they cost?

**Baer:** They're \$75 apiece. And we expect to release ten to twelve more within the next six months. Some of the planned programs include one on microwave applications, the paperwork according to the new FCC regulations, the forms, and so forth. And then there will be another video program done on coax. At this point we have invited 20 to 25 people to come into Washington within the next ninety days to do these programs.

**C-ED:** Judy, last year was a phenomenal year for the SCTE, in terms of both the number of programs presented, and the number of people attending those programs. In addition, the SCTE membership swelled dramatically last year.

**Baer:** Well, yes, that's correct. We brought in nearly 1100 new members last year. We started out at about 1500 or 1600 total membership as of year-end 1978, and we're presently at ap-

proximately 2800.

**C-ED:** That's phenomenal. While the cable industry as a whole is growing at an incredible rate, the SCTE is growing even faster. To what do you attribute the SCTE's explosive growth?

**Baer:** Well, for starters, the members are doing a marvelous job recruiting new members; and I think this reflects the fact that the SCTE has reached a point of maturity. We have grown, but the important point is that we're providing services and programs for the cable community, and through the development of programs it is becoming evident that it's extremely useful to be part of the organization. The members are coming out of the woodwork, from all kinds of places. In fact, a slow month for us is one in which we only get seventy new members. From the office here, we also do a concentrated promotional program all the time. For example, right now we are working on a program where in about the next six months there will be about 10,000 people that will be made aware of SCTE, its products and services, and what it's all about. We presently have roughly 45 products—educational material, test forms, conference records, the health and safety series, and so forth—which have been developed to serve the entire range of educational needs for the cable industry. The main purpose here is to help people do their jobs better.

**C-ED:** Last week we spoke with Ken Gunter of the NCTA engineering committee. He mentioned that he would like to see more participation from within the cable industry with respect to the filing of comments for FCC notices of proposed rulemaking. With the current rapid expansion of the SCTE, do you see a time in the near future when the SCTE will branch out into this area?

**Baer:** SCTE's prime function is manpower development, education and training. However, SCTE's membership has given the board of directors an awareness that the SCTE as an organization has reached a point of maturity where it is time that SCTE developed a technical committee. The co-chairmen of the technical committee are Tom Bird from Rollins and Dick Covell from Sylvania. The purpose of the committee is mostly to provide assistance in developing more educational pro-

grams, and to maintain lines of communication in order to release more information to the cable industry. For example, this could be in the form of white papers prepared by each committee member—which may or may not agree with each other on different issues. The technical committee also is going to be working with various schools, colleges, and universities, on a daily basis, for the development of curriculum and training programs. Things more of that nature. It is almost impossible to believe that we would ever respond to any regulatory or legislative matters without having coordinated that response through both NCTA and CATA. All of the people on the NCTA engineering committee are members of SCTE. Now, there is no doubt that you could look five or ten years into the future and there would be a likelihood that SCTE would respond to rulemakings. But again this will not happen without coordinating it. Quite simply, it would mean more to be doing something in concert, providing more input from the industry. It's very important to note that just because we're forming a technical committee doesn't mean that the role of that committee is anything other than to continue to develop ways of delivering information to the industry so that people can learn to do their jobs better.

SCTE's success has always been that it is apolitical. We hope and wish to remain that way; our basic charter is educational—manpower training, recruiting, and so forth.

As our membership grows, that job becomes more demanding. This office is working extremely hard not only to anticipate demand, but also to provide programs to meet that demand. One of the most important things right now is the continued participation of our membership. Without that participation, there is no organization. **C-ED**

## SCTE Announces Preventive Maintenance Seminar

Sound construction and operations techniques—the major considerations in cable system upkeep—will be scrutinized at SCTE's Preventive Maintenance seminar, to be held June 5-6, at the Empire State Plaza, Albany, New York. The program is sponsored in

cooperation with the New York Cable Commission and the State University of New York.

Topics and speakers on the *Construction* side include: "Preventive Maintenance Considerations," Steve Raimondi, UA-Columbia; "Headend," Tim Homiller, Jerrold Electronics; "Construction Techniques for Extended System Life," Mac Qurashi, MA Communications Corporation; "Sag and Stress," Larry Nelson, Comm/Scope; and "Sheath Currents," Allan Kirby, Telenational Communications.

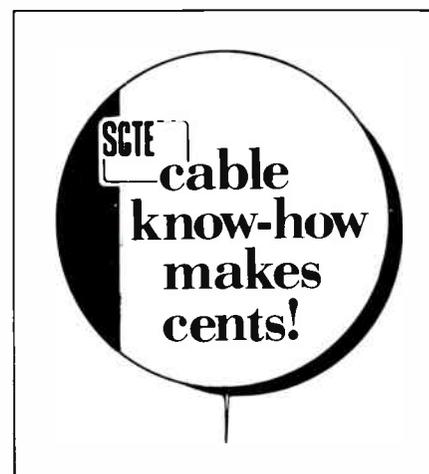
Participants in the session on *Stand-by Power, Surge Protection and Testing* include: Jim Palmer, C-Cor Electronics; Richard Covell, GTE Sylvania CATV Division; Jim Emerson, Northern CATV Sales; Carl Hemsley, Comsonics; and Sid Fluck, Wavetek.

The second set of sessions, *Operations Techniques*, features "System Spares," Tom Polis, Comcast; "Development of a Preventive Maintenance Program," Bob Tenten, Manhattan Cable; and "Trunk Preventive Maintenance," Bryan Wade, GE Cablevision.

*Repair and Retrofit* will round out the seminar. Participants are: Fred Rogers, Broadband; George Fenwick, KATEK; Harry Perlow, International Cable; Jim Stilwell, Times Mirror; and Ron Simon, Teleprompter.

Continuing Education Units will be awarded for meeting participation. Registrants will have the option to request University of Alabama or New York State credit upon registering. Advance registration deadline is May 20. Table top exhibits are included as a part of the program.

For further information, contact the SCTE office, (202) 293-7841.





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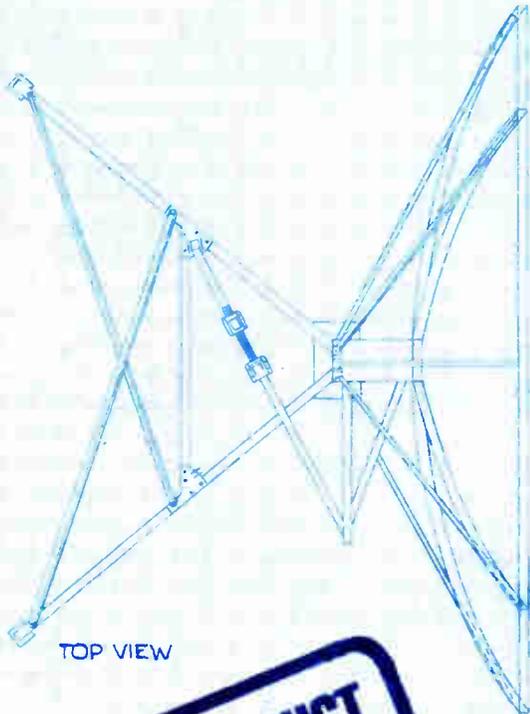
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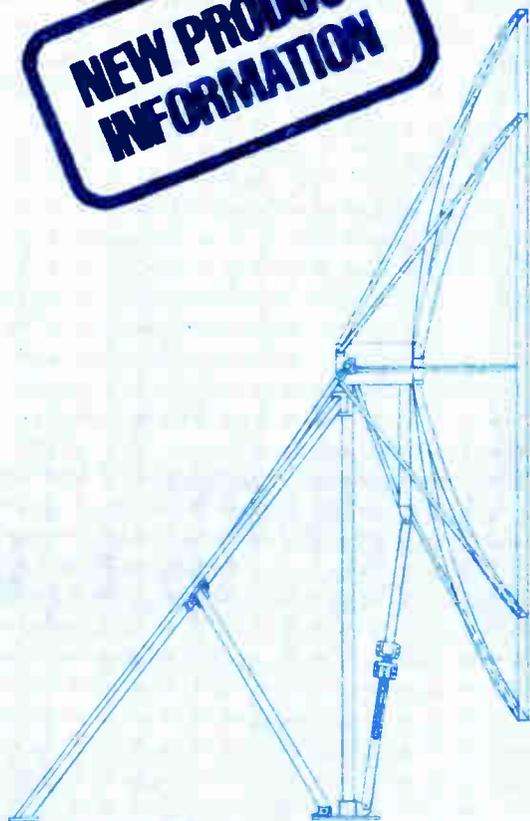
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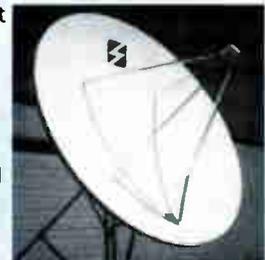
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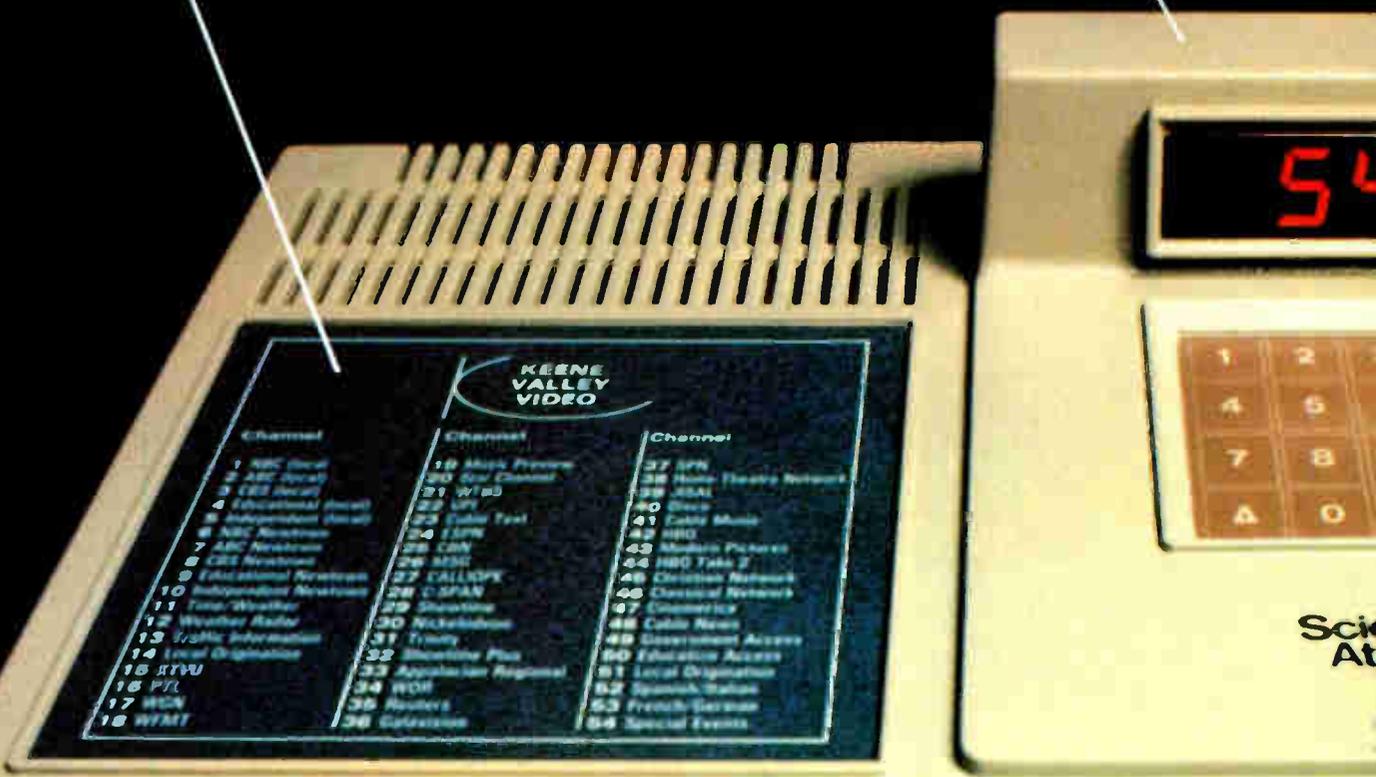


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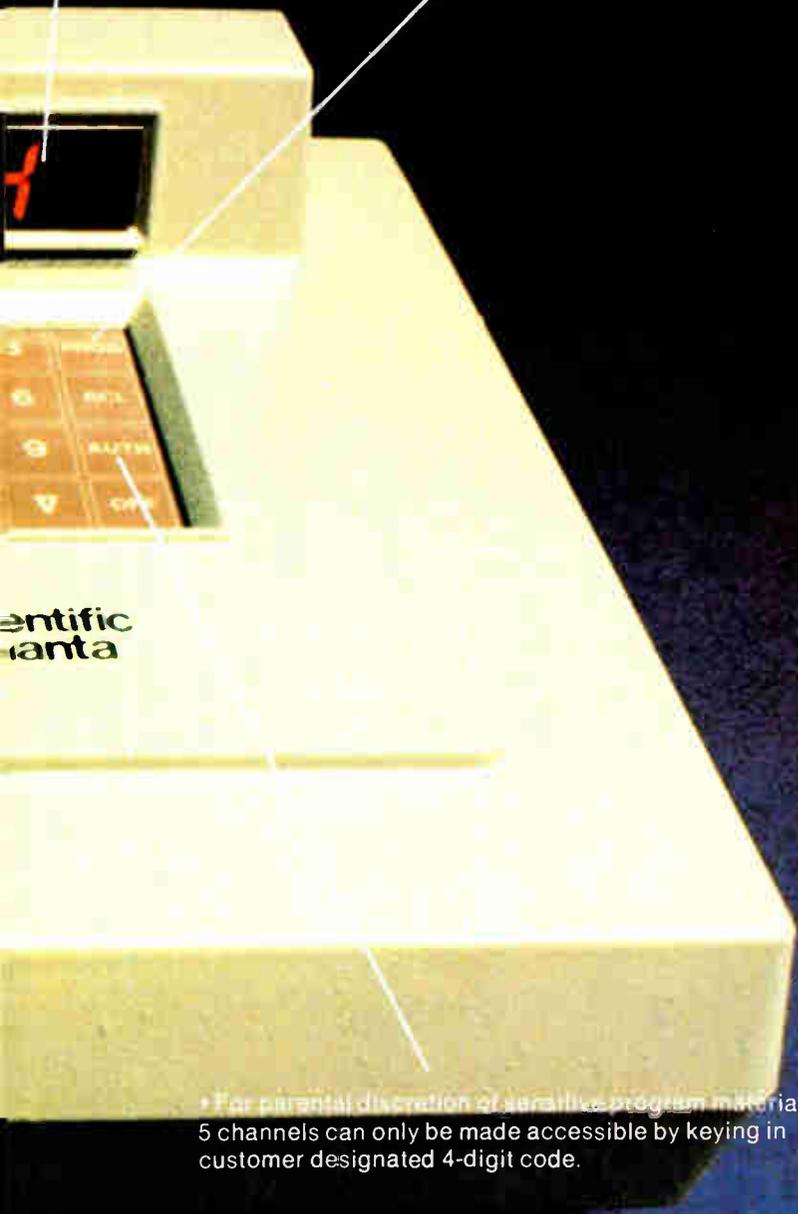
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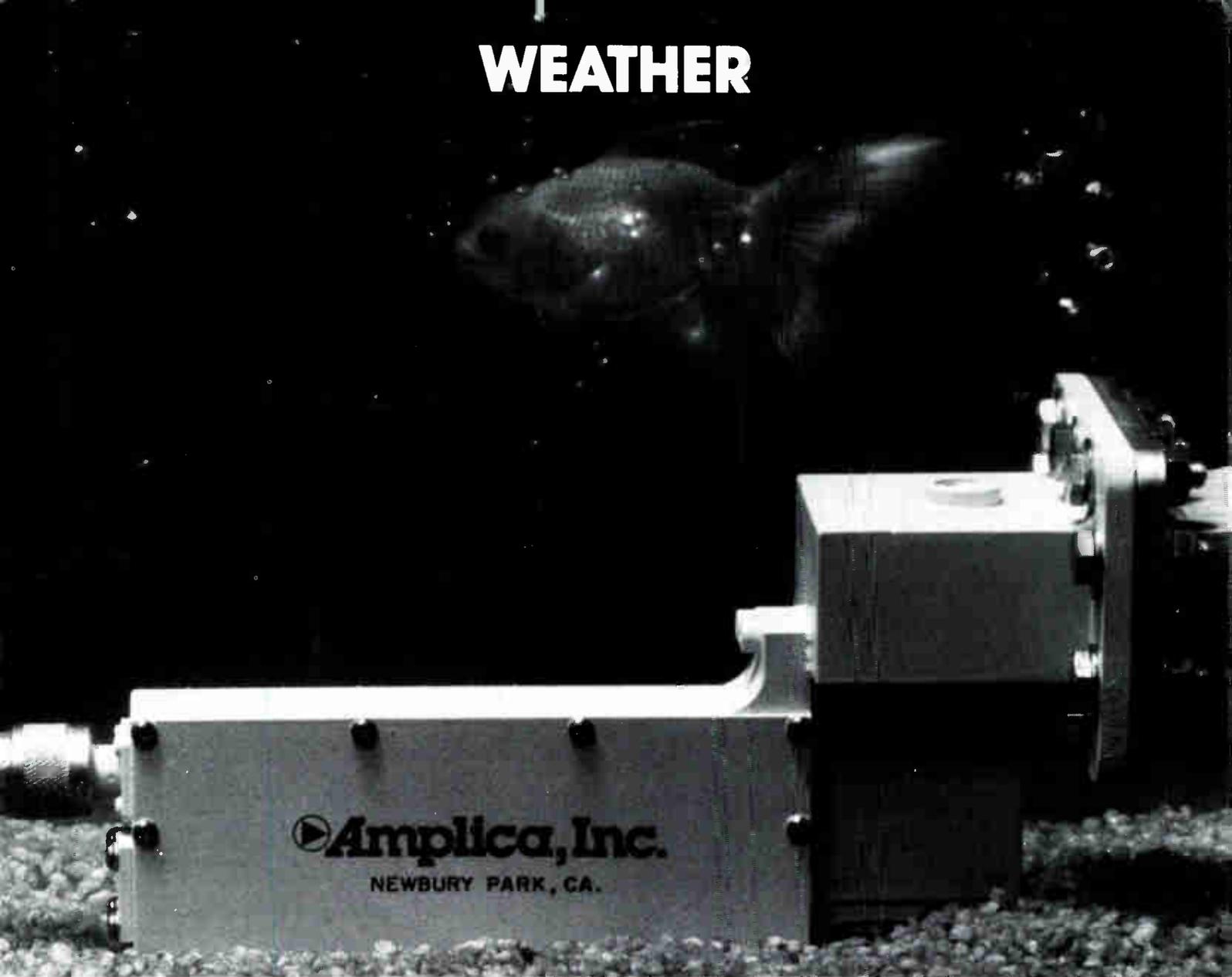
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## Home Satellite Reception Package To Be Sold Through Denver Firm

DENVER, COLORADO—Videophile, Incorporated, has been appointed by Gardiner Communications Corporation as the regional distributor of Starscan, Gardiner's satellite-to-home receiving package. The newly developed Starscan equipment enables the user to receive more than twenty channels of television entertainment and information from the satellites now in fixed orbit 22,000 miles above the earth. For the first time businesses, homeowners, farmers and ranchers etc. can obtain satellite reception regardless of their location.

Marty Laven, Director of Marketing for Videophile, announced the availability of the Starscan package. Laven said, "The dramatic growth of satellite communications has set the stage for companies like Videophile. Technological improvements and changing regulations allow us to offer satellite reception equipment to a whole new group of users. We feel confident that Colorado, due to its mountainous terrain and high-income levels, is particularly well-suited for the Starscan line of satellite terminals. This technological advance in communications will allow businesses and individuals to receive the highest quality television programming, regardless of geographic location. The equipment will also be available for motels and apartments and condominium complexes."

Gardiner Communications, a subsidiary of Burnup and Sims, Incorporated, is based in Houston, Texas and is a pioneer in the field of satellite receiving equipment. The satellite terminal package can be purchased for as little as \$10,000.

## Sadelco Granted Patent

ENGLEWOOD, NEW JERSEY—Sadelco, Inc., celebrating its 20th anniversary, announced that the U.S. Patent Office granted Harry Sadel, Sadelco founder and chief executive officer, a patent covering a "Method and Apparatus for Measuring Television Sound and Picture Signals." The patent was granted in February and

has already been implemented in test equipment manufactured by Sadelco.



*Harry L. Sadel, founder and chief executive officer of Sadelco, Inc.*

## SBS And Tymnet Seek Approval For Joint Demonstration

MCLEAN, VIRGINIA—Two communications companies—Satellite Business Systems (SBS) and Tymnet, Inc.—have announced plans for a joint demonstration of innovative techniques for intra-city distribution of business communications carried between cities via satellite and packet switching network. The proposed demonstration—authority for which will be sought from the Federal Communications Commission—would involve intra-city networks in New York City and San Francisco.

A third organization, LDC (a partnership being formed between Aetna Life & Casualty and M/A COM, Inc.), would furnish and install the intra-city distribution equipment to be used in the demonstration.

SBS's filing with the FCC will request authority to install and operate one earth station in the Wall Street area of New York and a second in downtown San Francisco. Tymnet will request authority to install and operate a "cellular" type of radio distribution system in San Francisco.

LDC, SBS, and Tymnet also announced plans for using cable television facilities in both cities to complete what they call their Local Data Distribution (LDD) demonstration network.

A limited number of end-user parti-

cipants in New York and San Francisco would utilize, on a test basis, the end-to-end facilities established under the program. These facilities would feature all-digital connections for data rates ranging from low speed up to 56 kilobits per second.

In New York, data distribution between user terminals and the program's local central node would be carried via wide-band coaxial cable. In San Francisco, it would be a two-part system of coaxial cable and specialized radio using the 10-gigahertz band.

SBS would provide the satellite channel between the two cities: Tymnet, which already provides extensive packet switching data-communications services in both cities, would be responsible for the program's central node in each city with its nation-wide packet switching network; LDC would provide the subscriber transceiver equipment as well as overall program coordination.

The central node in each city will be situated at or near the location of the SBS earth station. SBS will install and operate a 5.5-meter dish antenna on a rooftop in each city.

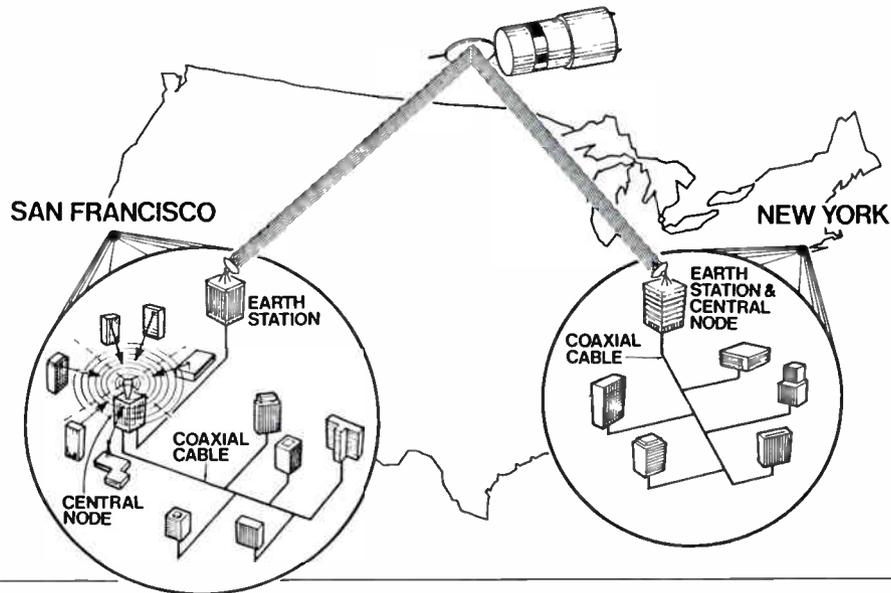
A program spokesman said the demonstration is "aimed at resolving the problem of transmission bottlenecks posed by traditional 'local-loop' facilities in metropolitan areas.

"To date," the spokesman continued, "the development of high-speed business communications has been hindered by inadequate and costly methods of local distribution. SBS has minimized this problem in its own service plans by using earth stations placed directly on customer premises. However, to the extent that any local loops are required, this program will develop and test alternative means for efficient handling."

The proposed demonstration "will test the ability to reduce or eliminate many of the local distribution problems by means of a combined cable and specialized radio network that will circumvent the local telephone plant."

Each participating location would be outfitted with radio-connected or cable-connected terminal equipment featuring simplified all-digital design. Transmission to the central node, from the central node to the SBS earth station, and cross-country to the other

## LOCAL DATA DISTRIBUTION DEMONSTRATION NETWORK



SBS earth station will use time-division multiplexing throughout.

Whether the local distribution is by cable or radio, each user will be provided with one low-speed port (50 to 9,600 bits per second) and one high-speed port (56 kilobits per second).

A cable television company in each

city would provide the interconnections from their head-end facilities to the central nodes of the demonstration program.

Using the 10-GHz band, the radio users of the demonstration network in San Francisco would be connected to the central node via two- or four-foot

dish antennas, depending on the distance from the node.

The planned cellular radio technique divides the radio users by location into four quadrants, each quadrant being served by a microwave transceiver with an antenna having a 90-degree fan-shaped area of cover-

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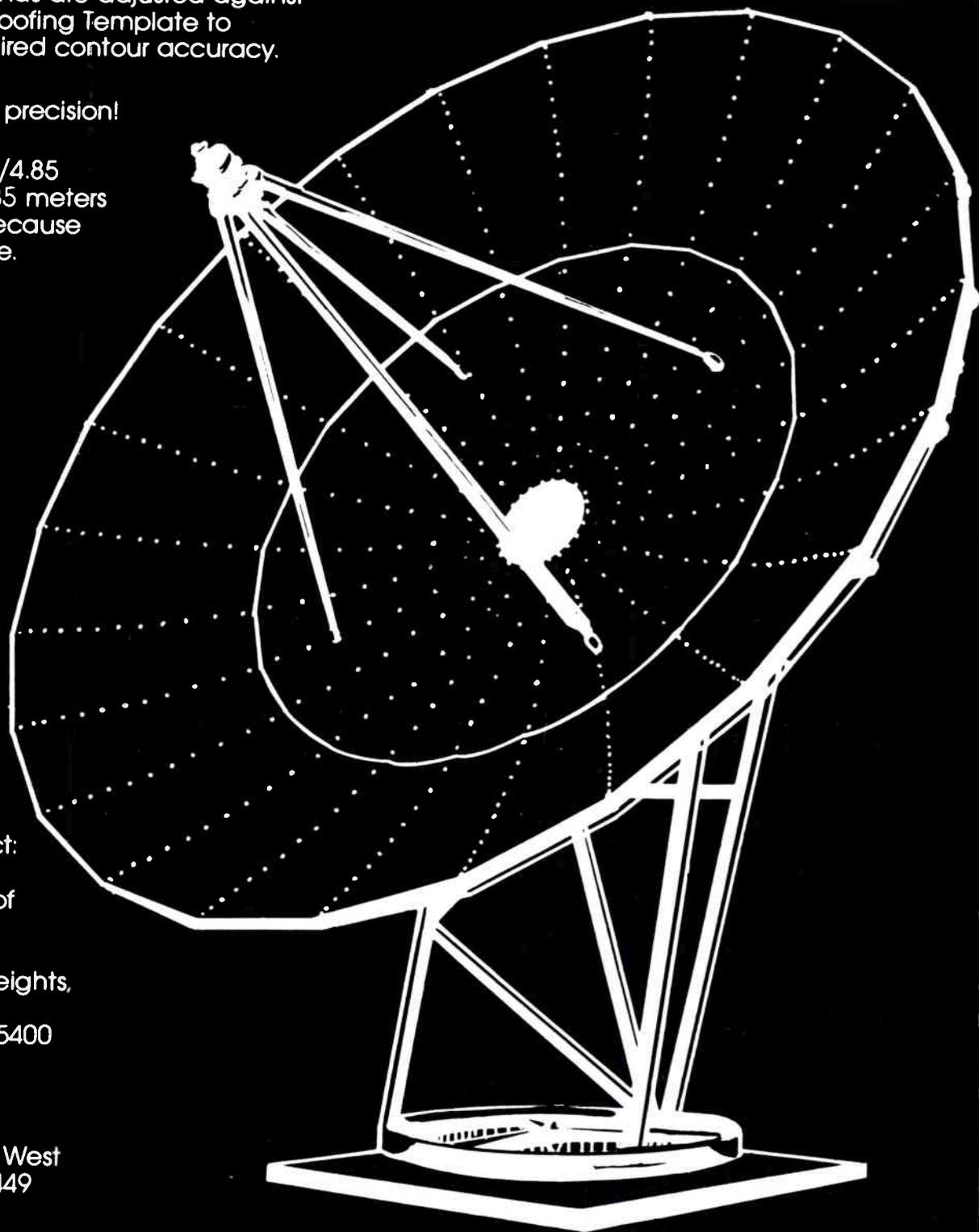
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age. The four quadrants together constitute one "cell." The quadrants will operate in different channels, each with a bandwidth of approximately 250 kilohertz. Each channel will offer a total transmission capacity of 256 kilobits per second.

The objectives of the program include:

- To test new, alternative forms of local data distribution.
- To test them in conjunction with an inter-city satellite link and a packet-switched network.
- To establish the service value of advanced local-data-distribution alternatives.
- To compare various local networking alternatives (e.g., wire pair vs. microwave vs. coaxial cable).
- To define what's needed for system implementation.

The schedule contemplated for the program calls for central nodes and subscriber transceiver equipment to be installed by year-end 1980 and for testing to continue through July 1981.

LDC—the planned Aetna and M/A-COM partnership—is interested

in studying and demonstrating the viability of wideband cable and radio transmission in U.S. cities and in becoming a supplier of local-data-distribution hardware.

SBS—a partnership sponsored by Aetna Life & Casualty, COMSAT GENERAL, and IBM—is working toward commencement of commercial operations in January 1981. SBS will feature all-digital integration of communications applications, including voice, data, electronic mail, and video teleconferencing.

Tymnet, a subsidiary of Tymshare, Inc., is a value-added communications carrier that specializes in packet-switched data networks.

### California Microwave Installs First Terminals For Satellite Broadcast Network

SUNNYVALE, CALIFORNIA—California Microwave has completed installation of the first 15 small aperture terminals for the Mutual Broadcasting System's satellite broadcast network.

The installations, made in the Eastern area of the United States and

accomplished under severe weather conditions, were reported as being smooth and routine. The terminals, which utilize 15-foot antennas erected on concrete pier foundations, were among the first to be installed following the FCC's deregulation of small aperture receive-only earth terminals in October 1979.

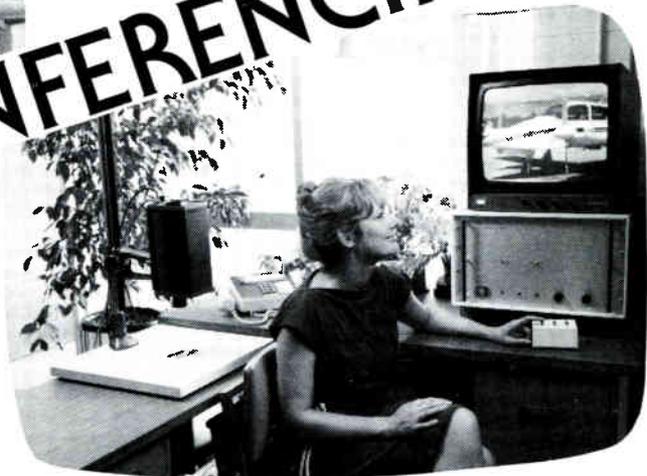
It was also announced that California Microwave has received a contract from the Mutual Broadcasting System to provide the uplink for their satellite broadcast network. The turn-key contract, valued at approximately \$600,000., involves installation at Brenmar, Virginia of an 11-meter transmit and receive antenna and associated electronic equipment. Operation is scheduled for the Fall of 1980.

The initial antenna is automatically steerable to any one of eight satellites and additional antennas to be supplied at a later date would simultaneously transmit programming to two satellites. The fully redundant equipment complement is similar to equipment California Microwave has provided to the Sultanate of Oman for its television, radio and telephone satellite distribution network.



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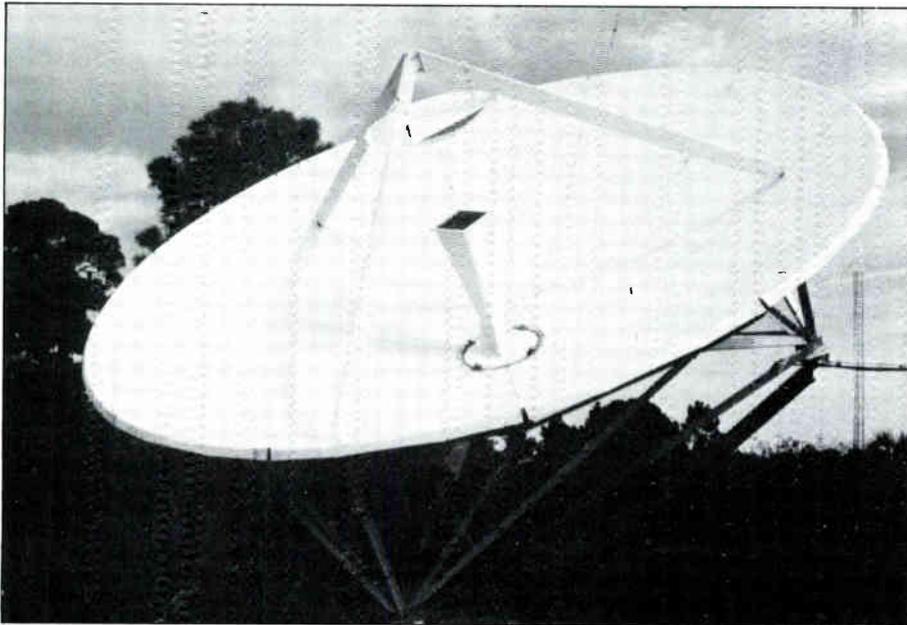
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Mutual Broadcasting System Receive-only Station

The uplink is initially equipped to simultaneously transmit six SCPC program channels and three cueing channels and it can be expanded as required. It can be fully automated by either remote or local control with a central processor.

California Microwave has installed downlink monitoring facilities at Mutual's network headquarters, and the Brenmar site will also have the same monitoring facilities, giving Mutual complete quality control of the satellite broadcast network.

## Burroughs May Enter Home Terminal Market

NORWALK, CONNECTICUT—Burroughs Corporation may be considering production of a new type of home terminal, according to a report from International Resource Development, Inc., a management consulting firm. IRD's new Directions Intelligence report on Burroughs reviews the firm's strategic posture, and concludes that a move into the fast-growing home information systems market may be essential to Burroughs continued growth in computer-related markets.

The 46-page report on Burroughs is part of IRD's Directions Intelligence series of reports which are published periodically.

In the present early stage of development of the home computer/information center market, Burroughs would be faced with significant problems in the area of customer education and equipment maintenance, according to the IRD report. "Probably Burroughs is viewing 1982-3 as the time-frame for its big move into consumer electronics," speculates David E. Frimpter, of the IRD research staff.

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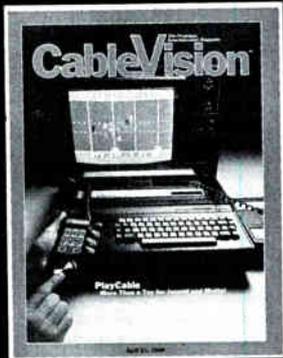
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"Burroughs has both the technological resources and the financial strength to become a major force in this market," says Frimpter.

## Southern Pacific Communications Plans \$200,000,000 Satellite Communications System

BURLINGAME, CALIFORNIA—Southern Pacific Communications Company (SPCC) recently announced that it has applied for authority to construct and operate a \$200 million domestic communications satellite system that would employ advanced satellites with twice the capacity of any domestic satellites now in use or announced for the future.

The application, submitted to the Federal Communications Commission, calls for a three-satellite system, a central tracking, telemetry and control station, and an operations control center. Two of the three satellites would be in orbit and one would be a spare.

According to the company, the rapid growth of SPCC's specialized common carrier services, such as its SPRINT long distance telephone service, combined with increased demand for video and other image transmission services, have led to the company's satellite plan which would greatly increase SPCC's communications capacity.

Gus Grant, president of SPCC, which is a subsidiary of Southern Pacific Co., noted: "Satellite Communications are a limited resource because the number of space slots are limited. Our proposal offers better utilization of that resource because the satellites will have twice the capacity of the others."

The increased capacity of the satellites stems from more efficient use of the transmission spectrum, and the use of integrated C-band (4 to 6 GHz) and Ku-band (11 to 14 GHz) transmission frequencies. This use of dual bands also permits the placement of earth stations closer to cities, which is more convenient and cost-effective.

Approval of the SPCC satellite system by the FCC would give SPCC the potential to expand its geographical coverage to all 50 states, including Puerto Rico and the U.S. Virgin Islands. The company's SPRINT system now covers 132 cities.

Should approval be granted to

SPCC's application, the company hopes to launch the first satellite by the end of 1982 and launch a second one about six months later. The company would build three earth stations initially with the number potentially reaching 100. The central tracking, telemetry and control station would be located at Cooksville, MD., with an operations control center in Bethesda, MD.

SPP's existing services and products include SPRINT, a low cost voice network for business and residential use; SPEEDFAX, a digital facsimile terminal compatible with SPRINT and non-SPRINT networks; DATAPOST, a form of electronic mail for time-sensitive information; international message processing; and transmission and various communications network and management services.

### RCA Americom Announces Expansion Plans For Cable TV Services

NEW YORK, NEW YORK—RCA American Communications, Inc., has announced comprehensive plans for expanding satellite communications services to present and future CATV customers.

The first step in the plan is the establishment of the company's second cable network, called CATV-2. As an interim measure, CATV-2 will utilize 11 preemptible transponders on the COMSTAR D—2 satellite, located at 95 degrees West longitude. CATV-1, comprising 20 channels of programming, will remain on RCA Americom's SATCOM I satellite until the new SATCOM III becomes operational late in 1981.

Service on the COMSTAR satellite was available starting April 1. CATV-2 customers will have the option of beginning their service from that date through June 1.

When the new SATCOM III is operational, CATV-1 will be expanded to 22 channels on that satellite while CATV-2 will be reduced to 9 channels on SATCOM I.

The second step in RCA Americom's plans recognizes the need to provide protected service to all CATV customers. To implement this plan, the company will utilize a new form of satellite loading as well as satellites of improved design and a ground spare satellite.

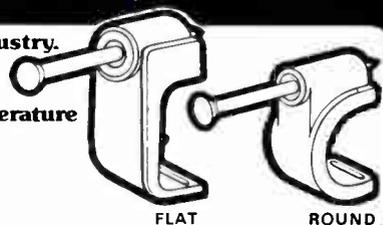
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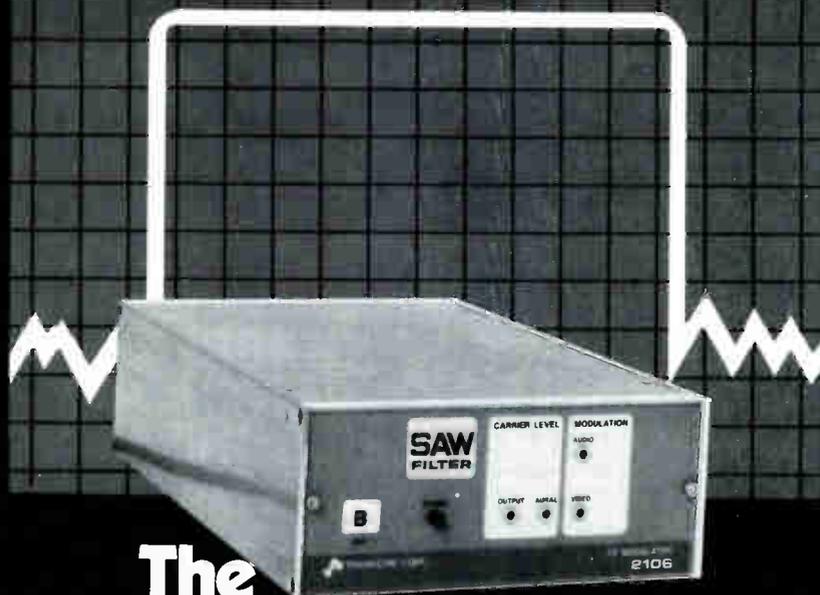
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In the new plan, operational satellites will have 22 protected transponders and 2 preemptible transponders and an in-orbit spare will have the converse. The 22 preemptible transponders on the in-orbit spare will be available only for short-term or occasional service. This portion of the plan will provide protection against catastrophic satellite failure.

To protect against individual transponder failure, RCA Americom has instituted a "belt and suspenders" policy. The belt is the provision of at least one spare on-board transponder for each six active transponders. SATCOM III and future satellites will have this feature. The suspenders are the two preemptible transponders on each operational satellite.

This improved protection policy will begin early in 1982 when RCA Americom's SATCOM IV satellite is operational. It will be fully implemented by early 1982 when the company's SATCOM I replacement satellite is operational.

"We believe that this program is progressive, and that it fairly considers the special needs of the cable TV industry," RCA Americom president Andrew F. Inglis told customers at a special meeting. "It is a plan that demonstrates our intention of continuing to meet the growing demands of the cable TV industry for satellite distribution."

RCA Americom noted that significant developments in the cable TV industry have cleared the way to permit rapid growth of CATV-2. First, satellite distribution is proved technically and economically. Second, deregulations of receive-only earth stations means faster installation of second dishes. And third, earth station manufacturers have indicated they can quickly gear up to produce 200 or more earth stations per month.

## Fiber Optic Prices Reduced

PHOENIX, ARIZONA—All of Motorola's fiber optic components, including emitters, detectors and detector preamplifiers, have been reduced in price by approximately one-third. The price reductions mark the initial transition into the volume production phase of manufacturing, and are expected to accelerate the implementation of fiber optics in equipment designs.

Included in the price reduction are

Motorola's latest ferrule emitters and detectors as well as its earlier TO-18 fiber optic components. The recently-introduced ferrule devices are designed to fit directly into the AMP Inc. fiber optic Optimate Ferrule Connectors for easy and accurate interconnection with fiber optic cables.

In a related development, Corning has published new price schedules for Corguide optical fibers that represent both pricing and performance benefits for users.

William L. Babcock, OEM sales manager for Corning's Telecommunication Products Department, said the new schedules incorporate the following: 1) Price decreases of as much as 33 percent for the series that Corning formerly termed "standard-wavelength" products, now called "first window fibers," or the Corguide FWF line. 2) Characterization of the FWF line at the source wavelength of 850 nanometers instead of 820 nm. 3) Introduction of "double-window fibers," or the DWF line, characterized at two source wavelengths—850 nm and 1300 nm. 4) Replacement of the series that Corning formerly termed "long-wavelength" products, characterized at 900 nm, with the DWF line. 5) A change in attenuation measurement techniques from full flood to a restricted launch excitation technique that Corning terms "limited phase space."

Babcock said the new source wavelengths of 850 and 1300 nm are becoming generally accepted standards in the U.S., Canada, U.K., Germany and Japan, where much of the leading work is being performed in optical communications. Likewise, manufacturers and users in these countries are increasingly adopting the new attenuation measurement techniques, he said.

Giving an example of the effect of Corning's changes, Babcock said the company formerly characterized a "long-wavelength" fiber at 3 dB/km attenuation, 400 MHz.km bandwidth, at 900 nm, measured by the full-flood technique. Now, he said, Corning characterizes a DWF fiber at the same attenuation, same bandwidth, at 850 nm, measured with limited phase space excitation. Price is the same. However, the customer receives the additional benefit of a fiber that can be upgraded by having the same or better performance at 1300-nm source wavelength, because it's a double-window fiber.

Tables showing performance summaries and prices are available from

the respective manufacturers.

## RCA Americom Introduces Audio Digital Distribution Service

PISCATAWAY, NEW JERSEY—An improved method of providing high-quality audio signals via satellite to radio stations, wire services and newspapers was announced by RCA American Communications, Inc., at the 1980 National Association of Broadcasters Convention in Las Vegas. Called "ADDS" for Audio Digital Distribution Service, the new offering uses state-of-the-art technology to increase the efficient use of the available satellite frequency spectrum.

Through the use of ADDS, a single network can distribute several programs simultaneously on a nationwide or regional basis. Receiving radio stations may select alternate channels of programming, as desired, or stations may receive two or more programs simultaneously. Network growth and expansion is achieved by adding more channel units to existing stations, while new stations can become part of the network by installing small, inexpensive, 10-foot receive-only antennas.

RCA Americom has extensive experience in digital technology, and is currently providing high-speed digital data services to many customers including NASA, NOAA, the Department of Defense and Western Union International. The RCA Americom system employs pulse-code-modulated (PCM), time-division-multiplex (TDM) digital transmission techniques that saturate a satellite transponder and greatly inhibit potential inter-satellite and terrestrial interference.

Other advantages of RCA Americom's ADDS include improved quality: 75dB signal-to-noise for 7.5 KHz or 15 KHz stereo; increased flexibility: more channels per transponder for easy system expansion (see table); security through signal encoding, and low cost resulting from the economies of point-to-multipoint satellite communications technology.

### Transponder Capability Through "ADDS" Technology

Service	Number of Channels
15KHz	20
7.5KHz	40
5KHz	60
56KBPS	120

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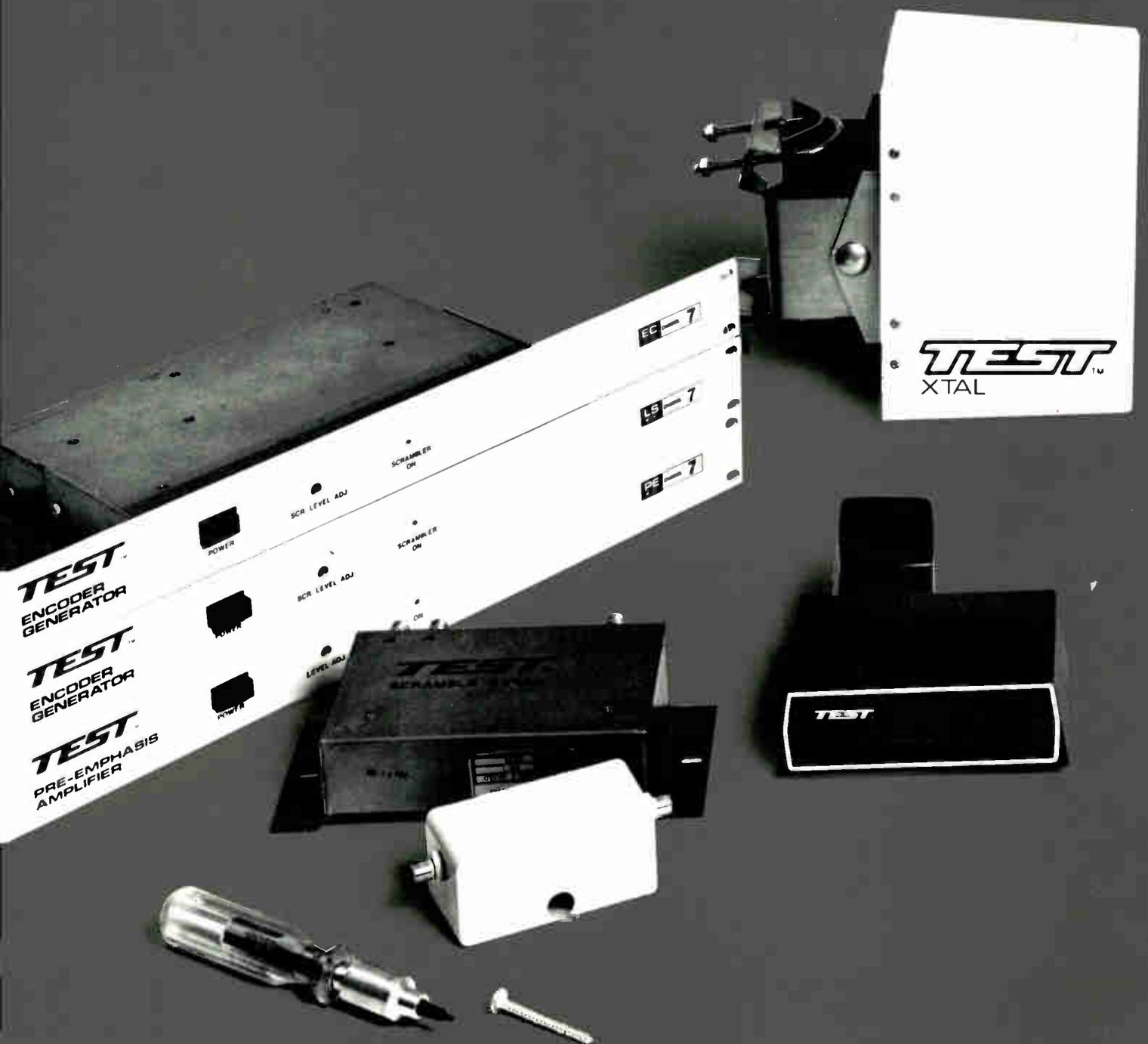
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# FCC Selects AM Stereo System

By Pat Gushman

The FCC was certainly busy in March—not only removing many of the restrictions on AT&T's ability to compete in the data communications fields, but also selecting a system developed by Magnavox for AM stereophonic broadcasting. While the effort to unshackle the telephone company and avail the public of the potential benefits of Bell's R&D was the product of years of investigation and policy formulation, the AM stereo decision has instantly come under fire for being hastily conceived. Like in a week.

In either case, time was of the essence. In the case of telephone deregulation, the FCC stated that computer technology is removing technical limitations as to the types of enhanced services that may be offered. It said a classification scheme which would categorize enhanced services as either communications or data processing would inherently limit or cause artificial structuring of services which may be offered over a telecommunications network. Therefore, the conclusion was that all enhanced computer services should be accorded the same regulatory treatment and that no regulatory scheme could be adopted which would rationally distinguish and classify enhanced services as either communications or data processing.

Also, in deregulating all carrier-provided customer premises equipment (CPE), the Commission noted that in light of increasing sophistication of all types of customer-provided equipment and the various uses for CPE, it was likely that any given classification scheme would serve to impose artificial, uneconomic constraint on either the design of CPE or its use. So it also concluded that the regulatory process, carriers, unregulated equipment vendors and the public would be better served if all CPE were afforded uniform regulatory treatment.

According to the Commission's order, deregulated services and equipment must be provided by AT&T and General Telephone and Electronics through separate subsidiaries. And,

these subsidiaries must obtain all transmission facilities for the provision of enhanced services under appropriate tariffs.

FCC Chairman Charles Ferris referred to the decision as having removed the barricades from the door to the information age. "The supply of communications products and services will be limited only by the ingenuity of businessmen and scientists," Ferris said. "Government will no longer be a barrier that prevents or delays the introduction of innovations in technology.

"We have all read a great deal about the marvelous inventions that the convergence of computer and communications technology will make possible. Consumers and businessmen will have highly intelligent communications products and services in their homes and offices that will increase productivity, save energy and improve the quality of life.

"As long as the development of new telecommunications products was subject to the whim of the regulatory process," Ferris added, "the evolution of this industry was subject to uncertainty. Now communications business entrepreneurs can be sure that the marketplace and not the government will decide their fate. They will be willing to invest more money, and the communications market will develop more rapidly."

How rapidly the AM stereo market will develop is another question. The Commission majority indicated that its decision in this case to select a single system such as Magnavox's was prompted by a concern that the new service be made available to the public as quickly as possible, although "... the Commission generally endorses the concept of the marketplace making such selections where appropriate. In addition to Magnavox, Kahn Communications, Inc., Harris Corporation, Belar Electronics Laboratory, Inc., and Motorola, Inc. proposed systems.

Ferris had an explanation for this one, too, however, as he issued this statement the day after the 5-2 decision was reached.

Our decision to permit stereophonic transmissions by AM broadcast stations marks two

significant developments for radio service to the public. First, by selecting one of several proposed, but incompatible, systems, we promote uniformity in delivering this new audio service. Our selection leaves open continued improvements in transmitters and receiver sets, but settles the threshold issue of what transmission system to employ. I am impressed with the arguments that we should have allowed all five systems proposed to vie for superiority in the marketplace. That approach might have spurred further possible innovation while limiting government's involvement in what might otherwise remain a marketplace determination. However, I believe that we have a sound basis in this instance to prefer uniformity, and I am convinced that our making this choice at this juncture better facilitates the growth of AM stereo and its ability to compete with the now successful FM service.

Our decision should also acutely impact retail sales of car radios, for auto-bound listeners are a big part of the AM audience. Availability of AM stereo systems in automobiles should also promote coincidental sales of FM car receivers, since so many FM stations already broadcast in stereo. Thus our decision should benefit FM stations which may have been excluded from the auto-bound audience because of the extra cost of adding stereo equipment. Now, addition of this equipment will allow automobile riders to acquire stereo service on both aural bands. I hope that auto-radio manufacturers will market AM-FM stereo receivers at a price that allows the driving public to reap these full benefits of our AM stereo decision.

One of the dissenters, FCC Commissioner Tyrone Brown, saw it differently:

In voting against authorization of a single system for AM stereophonic broadcasts, I do not fail to recognize that it would be proper for the Commission to intervene in the choice of a system if this were a technical issue involving the efficient use of spectrum. This, however, is not such a case.

All five systems evaluated meet minimum technical standards that insure spectrum efficiency and limit interference. Furthermore, the Magnavox system which the Commission proposes to authorize ranks only third best of the five in performance criteria that the staff used to measure the efficiency of the spectrum use. The choice of the Magnavox system as the best of the five requires the judgement that this system offers superior quality service to the public.

Once we have satisfied ourselves on spectrum efficiency and interference issues, this agency should avoid determining the quality of service it believes consumers ought to have, or attempting to anticipate the quality of service consumers would like to have. Such decisions are best left to the marketplace where consumers themselves have a say in the quality of service they receive and in whether a particular service is worth the cost. At least, the proponents of our intervention in the market should carry a heavy burden to show that such intervention is necessary.

Further, our action may in fact impede a true breakthrough in AM broadcasting. Once a single system is authorized, further innovation will be limited to incremental improvements in the authorized system. In addition, if the FCC gives its blessing to only one system, a new improved system will have to cross the hurdle of regulatory change as well as that of market acceptance before it can be used. This will both hinder the adoption of new technology and reduce the incentives for manufacturers to develop new or improved AM stereo technology.



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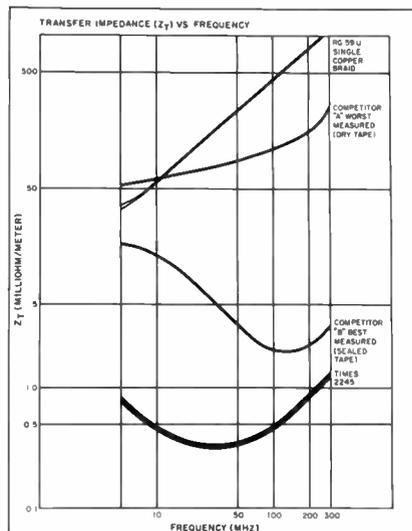
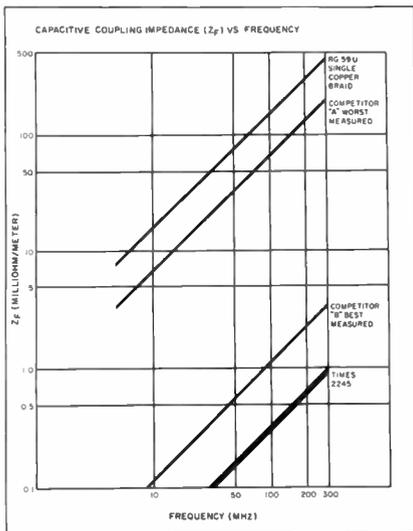
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# An Interview With Ken Gunter

*C-ED interviews Ken Gunter, outgoing chairman of NCTA's Engineering Committee. In this conversation, Gunter explains the current direction of the committee, developments on the technical front, and the future of the cable industry.*

**C-ED:** Ken, what is the overall purpose of the engineering committee?

**Gunter:** The engineering committee spends most of its time and effort advising the staff and the board of the NCTA along technical matters. It's really the eyes and ears of the NCTA staff in terms of a pipeline into the operations of the member systems. It's a forum where the staff and the other organizations within the industry, such as the FCC and SCTE, can sit down at one table with membership representation from operating companies and NCTA staff, and sort out the problems that relate to the engineering questions within the industry.

**C-ED:** How is it working?

**Gunter:** I think it's worked real well. Structurally, we have a chairman, in this case, me who is appointed each year by the NCTA elected chairman. I've been chairman for the last three years, appointed first by Dan Aaron in 1977, and then Bob Hughes, who followed him, and then most recently by Doug Dittrick. This will be my last

term as chairman: I have requested that they fill the chairmanship with someone else, starting in May.

There are 12 members maximum on each of the approximately 18 standing committees of the NCTA. So, like all other committees, we have held our membership to our 12 full members, who have to be NCTA operator or associate members, and then five ad hoc or liaison members: Judy Baer from SCTE, a representative from the Canadian Cable TV Association, the FCC, and of course the NCTA staff—in this case, Chris Weaver. Also, the EIA is represented.

**C-ED:** The satellite subcommittee has recently released two reports on satellite transmission modulation parameters and narrowband services. What sort of reaction do you anticipate from the cable industry as a whole with respect to the first of these two reports?

**Gunter:** I believe there will be a lot of unanimity on the theory of the standards. There are some people who feel

that any particular standards won't further their own selfish interests as well they might. But I happen to know that, for instance, some of the satellite carriers—the ones that carry independent TV stations on F-1—happen to like the opportunity of earning revenue with the subletting of audio subcarriers. As many as they can put on there. And those may not like our conservatism in the standards that we're developing. There are business reasons for feeling that way, but nevertheless I think the industry has to have a center-stripe in the road to go by; we're not trying to establish any law or edict for anyone to operate under, we're just trying to bring about some uniformity for the manufacturers and buyers of the equipment that will lead us to more efficient transmission, and more economical transmission, by satellite.

**C-ED:** With respect to the second report, what are some of the narrowband services that are currently being transmitted by satellite along with television signals?

**Gunter:** Well, on F-1, Reuters is transmitting the full frame data service, and there are numerous subcarriers, the most noteworthy and recent of which would be the WFMT signal, broadcasting FM programming out of Chicago. In addition, there is the UPI slow-scan known as Newstime. This latter is non-aural; it's transmitted by about the same kind of equipment, occupies roughly the same kind of bandwidth as wideband audio, but it's for slow-scan visual.

**C-ED:** What sort of input was available to the committee in formulating the guidelines contained in the report on narrowband services?

**Gunter:** The background for the second report was really our attempt to include all factions of the industry. We have about three manufacturers represented on the subcommittee, about three users or systems operators, and we also have representation from carriers. In this case, we felt the prime carrier was RCA, although there is some involvement by Westar and others. Basically, we tried to include manufacturers, users, and programmers—people who had an interest in the transmission medium as a sender—as well as a couple or three cable operators and the carrier itself. We felt that represented most of the points of view that would be in the industry concerning standards.

We call those standards because after all they probably will serve as such. But really, we're not trying to set up standards in the formal sense. We're trying to set up what would be more accurately described as good engineering practices for satellite transmission. It's a little dangerous to say standards in the EIA sense; those after become written in stone. They have a far-reaching effect that we don't necessarily believe to be appropriate for these satellite standards. These are not EIA-type standards. They are, rather, guidelines or good engineering practices.

**C-ED:** What major issues and areas of concern do you see developing in the next four or five years, and what action is being taken now by the committee to deal with them?

**Gunter:** I believe that the focus we've had in the last year or two in the committee is still going to be the proper one for the new committee chairman, and all of his successors for the next four or five years. There may be another two or three committee chairmen in that span of time, and they

are obviously going to be concerned with the expanding technology of our distribution systems, such as the move from 300 to 400 MHz. In addition, I certainly don't think that the issue of fiber optics is dead, it's only gone away for a while. It was a little bit too soon, too premature at the time our industry picked it up and began to talk about it, two years ago it's going to be back. I think the engineering committee is going to have a big job keeping the board of the NCTA and the staff fully apprised of the impact of that technology both on the franchising and the economics of building and operating systems. I am quite sure that the merging information utility idea is going to spill over into the cable television in the next few years—that is, teletext and view-data as applied to cable transmission. If we don't do it, it's pretty clear that someone else will do it for us. Or rather, to us. Most of what the cable industry has done for the past 25 or 30 years, has involved ideas or technology which we had an exclusive grasp of. In this case, the case of the information utility and data retrieval, it's not going to be that simple. The broadcasters, the networks, the telephone companies, are already experimenting with it. MDS and STV are both likely to get into it at one point or another. Practically every telecommunications technology you could name is forming around the idea of information-flow in and out of the household. In addition to this, there are other considerations, such as visual and aural services. So this is one thing that we're going to have to cooperate on in every way possible with the staff of the NCTA and the board in the next few years. We've got some big decisions to make in that area. As a result or a fallout of that new technology, fiber optics, 400 MHz, and information retrieval, you're going to see an even bigger role for the NCTA staff and board in the regulatory and legislative areas. New technologies seem to engender new needs for regulation of those technologies. Quite often it's the clamor of our competition that demands new regulation or legislation.

Now, more specifically, with respect to teletext and viewdata, the committee carries on two functions: one, we advise the NCTA board as to the new technologies, the competing technologies, the issue of having standards as opposed to not having standards. We advise them of what the broadcast industry is doing, and make some

recommendations as to what the cable industry as a whole should be doing. More specifically, we recommend what the NCTA should be doing for the cable industry in the area of teletext. Our strongest recommendation was to in fact have some kind of a seminar specifically focussing on teletext and those standards. Of course, that was the Disneyland teletext conference that Chris Weaver and Bob Luff coordinated. It was very successful, and productive.

The other half of that was that we at the NCTA feel very strongly about having standards. The thing is, it could be an inhibiting factor not having standards. A number of manufacturers are still waiting out in the wings because of the tremendous capital investment involved, and we want to insure that when they come out in the market with something, it's not going to be superseded the following week by someone else—maybe someone with a bigger flyswatter. So we have established a subcommittee on teletext standards—Jim Stilwell of course is the chairman—and Jim or his designate attends all EIA teletext standards meetings. He then gives us a report, and we pass that on to the board members who are interested.

So, it's sort of a two-pronged approach on the subject of teletext, and clearly comes under the designation of the goals and functions of the engineering committee. Another area is—without enumerating all of them—the numerous FCC technical rule changes. Every one of them is read by either Chris Weaver or a designate, and its potential implications both in the near-term and the long-term are analyzed and, where appropriate, brought up for discussion in the engineering committee meeting. Following that, by way of letters or minutes, certain matters are brought before the board. For example, the commission is contemplating a review of receiver standards. Our view there is that 20 percent or more of that nation's viewing public has chosen cable television as the delivery medium for all their television programming. Yet the TV set is still designed 100 percent for the over-the-air medium. There are differences. And we have been addressing, through lobbying efforts in Washington, in an informal way—and soon in a more formal way—exactly what are the cable TV requirements for receivers. For one thing, the adjacent channel performance is much more demanding for

cable television that it is for over-the-air reception. In addition, audio and a number of other factors really need to be looked at in the 1980s, like they've never been looked at before.

Computers are another area that the commission is regulating—how, for example, the computers interface the television receivers, whether they come in through the antenna terminals, how strong the signal should be, and so forth. That in turn will impact much more than just the amount of interference which is produced. Supposed, for example, it's a cable household; now they have a home computer or a video game or a VTR, how will that interface with the TV without destroying the integrity of the cable television connection, jeopardizing its quality of service or violating the FAA signal leakage rules? Under those circumstances, there is something additional between the cable connection and the TV set which the subscriber has installed and over which we have very little control. In fact, it's been installed after the fact, with varying qualities of control, and various leakage characteristics, and numerous other factors. It's little things like that, which at first blush seem like a big yawn to the average reader of regulatory paperwork coming out of Washington. Nevertheless, somebody's got to perform that kind of function, and that's what the engineering committee has done. We get into the real nitty-gritty, and discuss each and every one of these topics during the meetings.

Another big item on the committee's agenda was the topic of microwave expansion—the CARS area. As you know, we've got double the frequency capability now; that was done this year through the efforts of the engineering committee. Those comments, reports, strategies—in fact, all aspects of the lobbying effort—were for the most part orchestrated by the NCTA engineering committee.

One other issue, of course, is our potential entrance into the 2 and 7 GHz bands, which are other alternatives besides the CARS, and which the commission has left for another proceeding. We are actively pursuing gaining entrance into that as well.

The other really major issue, besides the satellite standards, I would say is the grounding and bonding issue. Again, we have the delegates who attend those meetings, and in turn advise the committee, which in turn advises the NCTA board as to what are

the present requirements, proposals, changes, and so forth. The goal is to set out how CATV should properly ground and bond, as well as meet the national electric code and other requirements. That's a very important area to monitor, because it affects every cable system in the country.

At any rate, that's not inclusive, but it will give you an idea of the scope and the breadth of the issues which come up. In addition, the last thing I wanted to mention about committee meetings is that so far in my discussion I have reflected only on the formal agenda; there is also an opportunity for anyone around the table to bring up any topic they so desire. Sometimes that happens just around lunchtime, but quite often it happens at the regular meetings, where someone will just frankly have a problem or an issue that they want to discuss—perhaps a glitch, or a recurring system type failure. It may be a problem with a computer interface. At any rate, when it's brought up in one of these meetings, it acts sort of as a jungle telegraph: here's a problem that we've had or a solution that we've found. In this way, the information gets distributed around to the members here, and of course is also reflected through the minutes, and is then circulated to the board members and anyone else who asks.

**C-ED:** What sort of relationship exists between the committee and the FCC, both historically, and as it is currently developing?

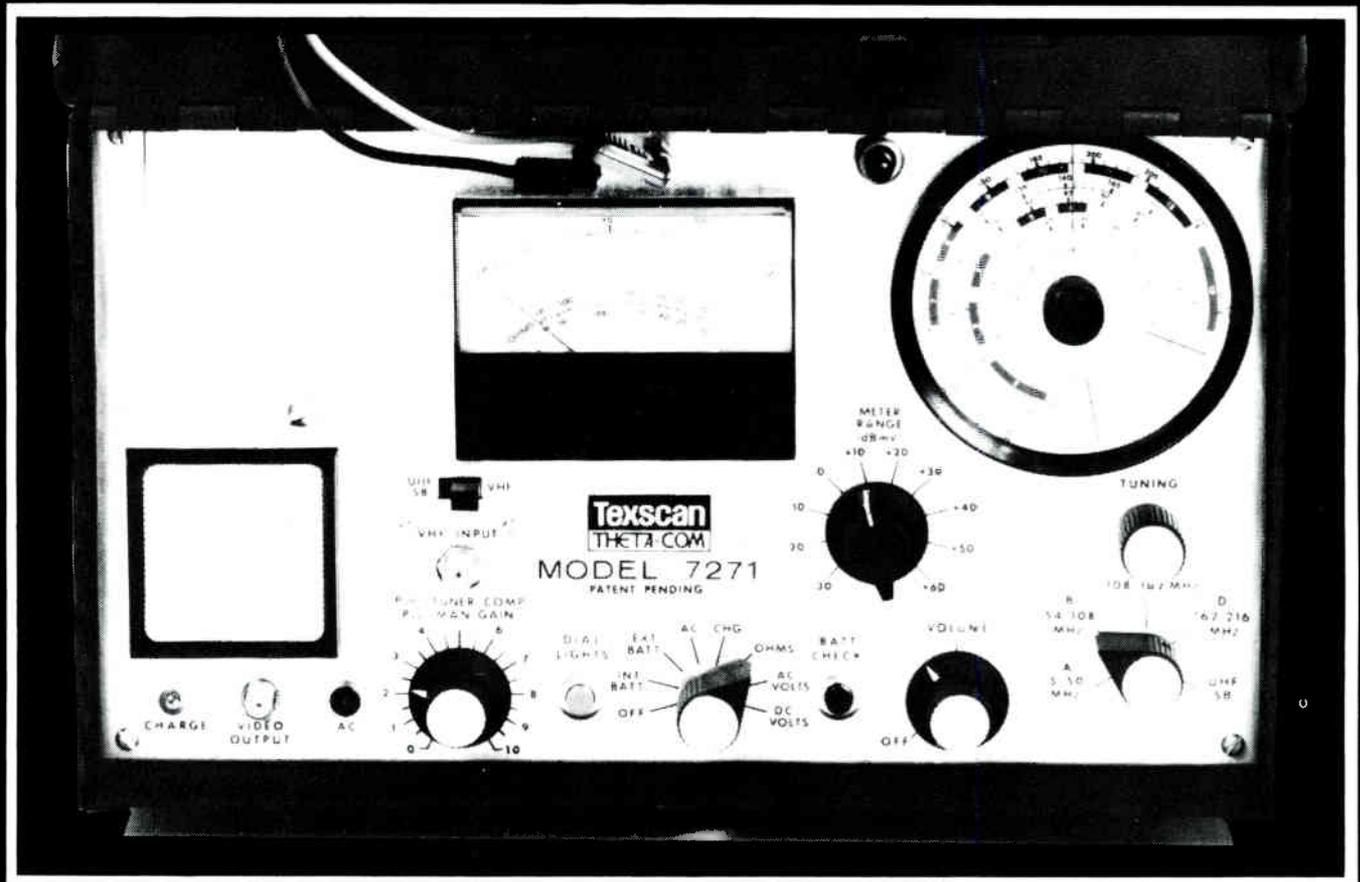
**Gunter:** Of course, the formal relationship is through the so-called "liaison." Ideally, we're trying to establish a relationship in which there is a free flow of factual information and concern that each party has for the other; kind of a forum in which each can present the broader conceptual issues which are coming down the line. Now, with the development of certain ex parte rules recently, there has been some restriction of the type of relationship which the trade association is able to have with the FCC and with some of the personalities over at the FCC. At present, all meetings with the FCC must involve active, ongoing formal proceedings, whether they concern an official release of notice of proposed rulemaking or whatever. When you begin to discuss a particular item, you can no longer just do it over lunch in a friendly atmosphere, you now must have a written transcript or at least an outline of the topics discussed and then relate to those formal proceed-

ings a synopsis of the points brought up or the direction in which the conversation went. That outline or synopsis must be included in the formal written record for all parties to review and give counter-viewpoints in the event they don't agree with some of the interplay between the FCC and all of the industries involved with the FCC, including cable. I would say that on cable's part, we haven't just walked away from those rules, we've aggressively pursued discussions in these areas. But we've also done it by the book. We haven't just gone away because of those rules; we've continued to make our points known, but we've gone through the requirements of putting in the outlines and formal responses and so forth. After all, that is what the engineering committee and the NCTA are charged to do.

**C-ED:** Do you see the role of the committee as becoming more aggressive? In other words, unlike other organizations which have faded away because of the new rules, the NCTA has persisted. Do you believe that this persistence is accelerating even now?

**Gunter:** Well, obviously we are going to continue to maintain an aggressive posture, where the issues suggest such a role. I don't think it does anybody any good to make a lot of noise unnecessarily. The thing is, there happen to be certain issues which we should be making noise about. Insuring future spectrum for CARS development is certainly one. The area of standards and the deregulation of standards is another—not just eliminating federal standards and substituting a myriad of local standards which could be even more impossible to meet. Different communities could just randomly have different standards, and that in turn would thwart test equipment manufacturers, preventing them from having a common scale or a common red line on the meter. It would also hurt training because everybody would be using different vocabularies in different states. There's a real justification in having some federal activity in the area of standards for technical performance. On the other hand, in a deregulatory posture, the FCC and people who give oversight to the FCC are asking the question why are we regulating technical standards at the federal level? Shouldn't that be left to the option of the individual community depending upon the kind and quality of reception they would like to have, and what they're willing to compromise as far as

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price versus quality, and so forth. Why should the federal government get involved? There are really two issues here—the cable engineers and the industry as a whole have to identify what their preference is, and what would be best for the subscriber, and then they should go to Washington with that story, and the evidence and examples to support that.

In the long run, I do see a shift. The industry is maturing very rapidly, and, while we will never see the day when we won't talk about connectors, and grounding and bonding, splicing, and some other habitual problems in our industry, more and more time is being dedicated to the future, in these committee meetings. Where are we going, five years from now, in information and data services? What kinds of standards do we need to think about that will connect keyboards for computer terminals—whether they be at home or in the office—with our traditional coaxial distribution system? These things take three and four years to work out, and be accepted. We need to lead the development, or at least not be an inhibiting factor to these new areas of pursuit. I think it's a very healthy sign, that things are taking their present complexion.

Now, I'm not trying to negotiate a pay raise for Chris Weaver, but that's exactly why he was hired—someone with his background, education, and experience was needed to keep up with these developing technologies. One of the criticisms has been that he hasn't worked in a cable system, he hasn't climbed a CATV pole. But those aren't the topics that are germane right now in cable television development in Washington, D.C., in the regulatory interface that Chris Weaver is charged with; this updating and reporting to the board of potential bottlenecks and glitches that are likely to address the industry five years down the pike. The more traditional chief engineers and chief techs are going to be taking more and more of the responsibility for the day-to-day operational type problems.

**C-ED:** As long as we're discussing Chris Weaver's job, specifically are his duties as Vice President of Science and Technology for the NCTA, and also, what is his relationship to the engineering committee?

**Gunter:** I'm glad you mentioned that, because that too should be used as an example of the shift that is occurring. There is now a Vice President of Science and Technology instead of a

Vice President of Engineering. The new title represents a broader perspective than just climbing poles and balancing amplifiers and so forth. It has gone way beyond that. Chris' role, while not terribly different from that of the engineering committee, is to monitor the regulatory activities both in Washington and in the various states insofar as they may have national implications. He is to report those developments as he perceives them to the board and staff of the NCTA, the engineering committee, as well as various other people and organizations within the purview of NCTA. For example, in some instance perhaps the manufacturing segment of the industry is concerned with some specific OSHA requirement. Although that particular set of regulations may not apply to the operators, Chris' office would act as a sort of a clearinghouse, the industry's ears for proposed changes that would affect how we do things, both operationally, and from a cost perspective. In addition, and not necessarily in order of importance, he also acts as the information gatherer for other countries, other governments which may be modelling their cable television development after the US. Someone has to answer those requests for information, in relation to technical standards, construction methods, and so forth.

Beyond that, Chris' job with the NCTA is to help the NCTA in its goal of getting the industry to think beyond yesterday's problems, or even just today's problems. We need to anticipate tomorrow's problems right now, in areas like training, test equipment budgets, and reliability concern. Clearly the 1980s present a monumental challenge to the cable industry, and we must face that challenge. We must constantly look at new applications, such as teletext, home computers, burglar and fire protection systems, stereo, multi-language, and things that you and I haven't even thought of yet. We have to be ahead, and be constantly looking at new services as well as their impact on the industry and society as a whole. In turn, we have to report these findings and get people in the industry thinking about them. There's a tendency to lose your sense of the future and your foresight when you become wrapped up in day-to-day business and the phone that's ringing right now. The industry should have at least one office with people paid explicitly to keep track of the pulse of technology. We need professionals—true profes-

sionals such as Chris Weaver—to insure that we don't lose sight of what's coming down the road.

**C-ED:** We understand that the FCC has recently released a report on signal leakage. What has the committee done or contemplated doing with respect to signal leakage standards?

**Gunter:** Two things here. First of all, there was a report that was released in which the NCTA, the FCC, and the NTIA jointly participated. This report concludes that the 20 microvolt per meter at 10 feet is a very strict standard, which is at least a questionable requirement. The report goes on to conclude that it might be relaxed to as much as 100 microvolts per meter measured at 10 feet. That was the final recommendation of that so-called industry advisory committee report to the commission.

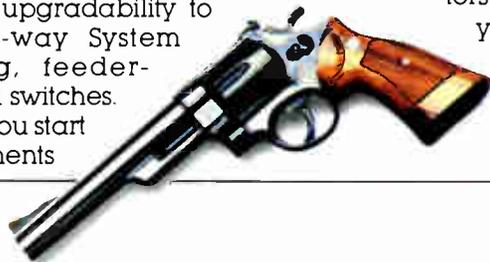
Then, after that report, the FCC, on its own motion, has issued a notice of proposed rulemaking to in fact deregulate the 20 microvolt requirement to the 100 microvolt level. That is the operative document now. Chris received a copy of that NPRM, distributed it to various people within NCTA, who, in turn, submitted their comments to Chris so that he could draft official comments. That draft was then circulated among the advisory committee members, sort of fine-tuned within that committee environment, and that then became the basis for the NCTA comments. Chris then polished it up, and submitted it to our legal department to make sure it meets the proper format and that any ancillary examples or statements we may have made enhance our position in other active filings. It's also important, of course, that there be no contradictions with previous filings. Finally, the comments are filed within the FCC-imposed deadline. Meantime, other companies are free—and in fact encouraged—to read these proposals and submit separate comments to the FCC. It's important that the commission realize just how crucial some of these issues are to the industry as a whole, and also that they realize that we are not just going to passively accept rules that cannot be justified or which are too strict or without foundation. The cost of money, time, people, and resources is simply too high. In situations like that, the more people who strongly oppose—or encourage—the commission's line of thought, the more that impact will be felt by the commission. **C-ED**



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# A "Mini-Two Way" Interactive System Installation in Tokyo Hotel

*By Michael Hayashi, Staff Engineer, Pioneer Communications*

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The Hotel New Otani in Tokyo, Japan, is slated to utilize a highly integrated, small scale version of the Warner Amex/Pioneer "QUBE" system in Columbus, Ohio. Installation, which began late in 1979, is set for a May switch-on. This system uses practical applications of two-way interactive CATV technology specifically for hotel, hospital, and office building use. The two-way system redesign was due to considerations of the smaller, and different hotel environment. The Hotel New Otani has 2100 guest rooms, and is the largest hotel in the far east.

Standard cable system mainliner is not required in the hotel plant because of the controlled environment. In order to maximize the advantages of an indoor plant, the distribution system hardware was redesigned to eliminate unnecessary expenses. No longer considered problems were operating temperature, cable powering, and housings.

System upstream noise is handled in the conventional two-way cable plant by use of system segmentation, thereby avoiding full impact at any

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**“. . . tampering with the terminal by the hotel guest is seen by the computer, resulting in a terminal disable command to the terminal"**

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time of all cumulative noise. In the "mini" system, several factors contribute to lessening the upstream cumulative noise problem. First, the building itself acts as an insulator, curing the usual CB interference problem. Second, the universe of the mini-system is considerably simpler than a conventional cable system; i.e., fewer terminals, and no lines being disconnected and opened. In addition to these factors, there is the added specialized technology designed into

the Pioneer terminal which limits it as a contributor of random noise. The terminal also utilizes a buffer amp stage. The amp serves to improve input return loss, which is extremely important in a close environment for room to room interference. Since Pioneer designed the line equipment it also made provision for status monitoring of an active equipment in the forward and reverse directions from the central computer.

Product security needs were seen as different in the QUBE and Hotel New Otani system. Picture scrambling was necessary in Columbus as an additional security method redundant to the terminal disable command from the cable operator office computer. But in the controlled environment of the hotel system, picture scrambling was eliminated. Every guest room terminal was semi-permanently wired to the TV set which can only tune to a fixed frequency. Any tampering by



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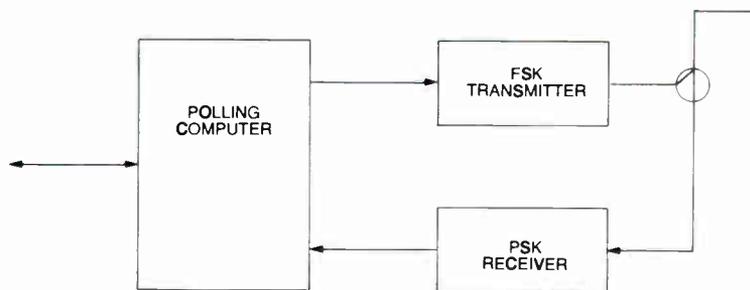
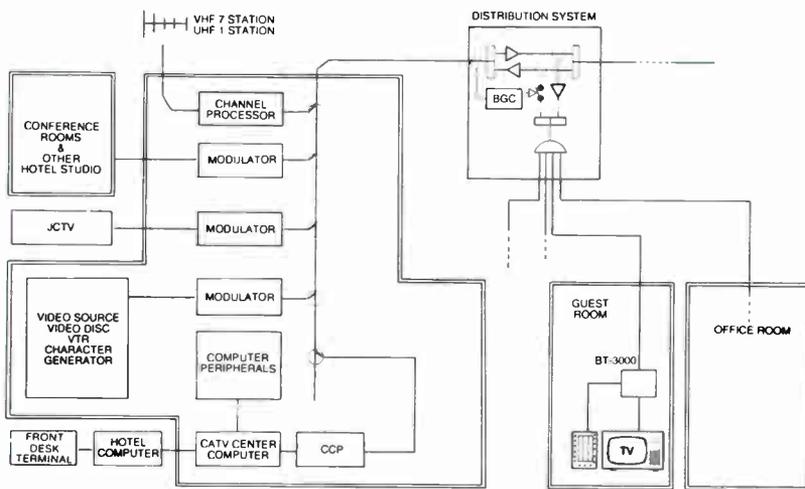
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FIGURE 2  
NEW OTANI SYSTEM BLOCK DIAGRAM



PIONEER COMMUNICATION CONTROL PROCESSOR

guests is seen by the computer, and results in a terminal disable command from the central computer.

The differences between the typical QUBE subscriber and the hotel guest led to design and function changes in the Pioneer terminals. In Columbus, the QUBE subscriber is educated to be aware that punching into a premium channel automatically starts the billing. This is not the case of the hotel guest, who may not be familiar with the system. The terminal must be very simple in operation and the hotel guest must be taught the operation of its 32 channels quickly. Automatic tuning is used to prevent accidental buying of

premium services.

When the TV set is first turned on via an on/off switch on the remote console the terminal automatically tunes to the "System Guide" channel. This channel explains the overall operation to the guest and delays selection until the instructions have been read. The guide channel contains a selection of programming times and channels, but

**...an emergency message can be cable-cast to all terminals by combining 'force-tuning' and 'set-on' functions"**

also explains a selection sequence for premium viewing. The final step in the procedure instructs the viewer to depress a specific button on the console for release from the automatic channel and clears the terminal to select any channel without further interference.

Another featured item of the Pioneer Hotel System is the ability for substitutive and normal narrowcasting. An example can best illustrate this feature. A hotel operator can "rent" a channel to several groups of guests, such as tour groups, conventioners and so on. By accessing the terminals via the computer the operator can automatically tune these groups to separate programs although they have all depressed the same button marked "Special Interest Groups." An operator can accommodate three to six groups, and provide simultaneous programming unique to each, but only tie up two channels on the console.

In addition to this automatic tune feature there is the computer controlled on/off function. The set can be automatically turned on for wake-up or off at check-out. This feature can be used together with the "automatic all-tune" function to send a message to all occupants regardless of TV on or off, or what channel is selected.

High speed data communication is required in a conventional two-way system from head-end to terminals and vice-versa. Several medium-sized computers are required to maintain the system and associated peripheral functions of the normal sized two-way system. For cost-effectiveness in the "mini" universe it was necessary to also revamp the computer control hardware. The Communication Control Processor (CCP) was developed to replace the multi-hub front-end polling computer. Existing within the "mini" universe the CCP can now handle polling and limited, but sufficient peripherals for stand alone operation.

The CCP consists of a stand alone polling computer along with data receiver and transmitter. The CCP has a standard RS-232 I/O Port which may be interfaced to any other large capacity computer. The hotel system in this case does have a separate control computer to allow for real-time developments by Pioneer engineers. Pioneer is looking to constantly expand the capability and application of the mini two-way system for hotel/motel, hospital and office use. C-ED



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# Characteristics of a Standby Power System

By Charles Turner, President,  
Control Technology, Garland, Texas

## Forward Transfer UPS Versus Standby Power

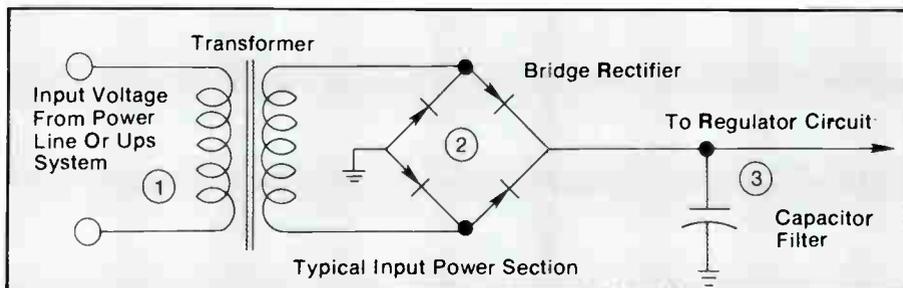
The forward transfer UPS is not a standby power supply. Standby power is generally considered to be a secondary power source that can be provided following a brief interruption. Standby power systems can be electronic or electro-mechanical as in the case of a motor-generator set. A typical electronic standby power supply will re-power the load after an interruption of 50-400 milliseconds. A typical automatic electro-mechanical supply will take 1-5 seconds to re-power the load. Of course, some motor generator sets are not automatic and require human intervention before they can re-power the load.

In the electronic standby power system the inverter is normally off of "un-excited." When primary power is interrupted, this condition is detected, the inverter must power up, and the load is switched to the standby power supply. Standby power supplies do not generally have any provision for re-starting the load in phase relationship with the last phase or polarity of primary power. Restarting the load in the wrong polarity generally will cause saturation of the load inductances and cause an additional delay of several milliseconds.

In the forward transfer UPS, under normal conditions, the inverter is lightly loaded or "idling" and in synchronism with the primary power

source. There is an immediate transfer of the load to the inverter (usually less than one millisecond) when the loss of primary power is detected. The actual detection of the loss of primary power may take from 1-5 milliseconds, depending on the phase angle, amplitude, and relative distortion of the primary waveform at the time of interruption. If the primary power is within "reasonable limits" with respect to distortion, the load will be transferred

generally given only passing consideration to the type of loads presented to the power source by their equipment. This is understandable since these devices have been designed to receive source power from a conventional power line which can be considered a nearly infinite source of current and power as a practical consideration. This type of equipment usually presents the following typical type load to the power source:

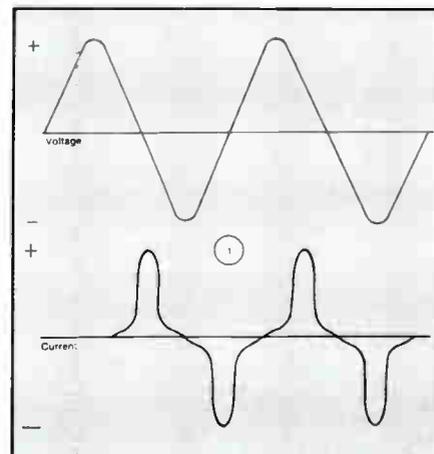


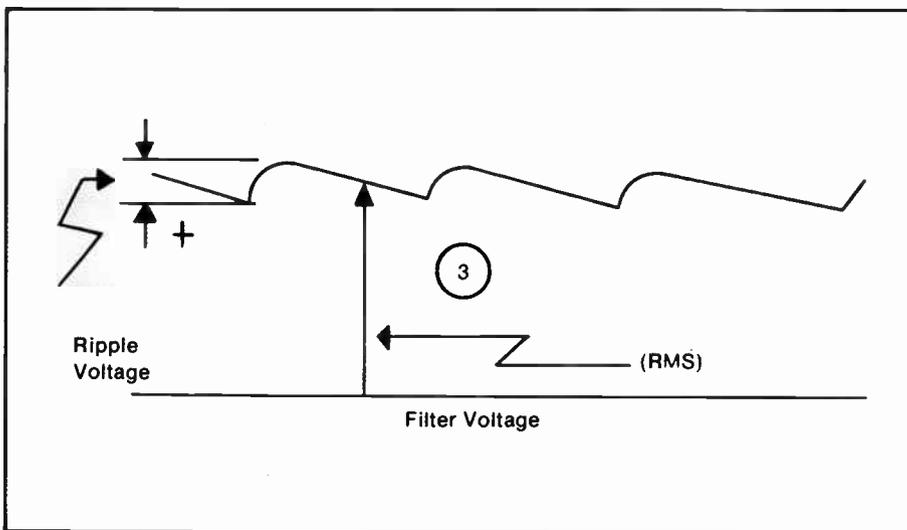
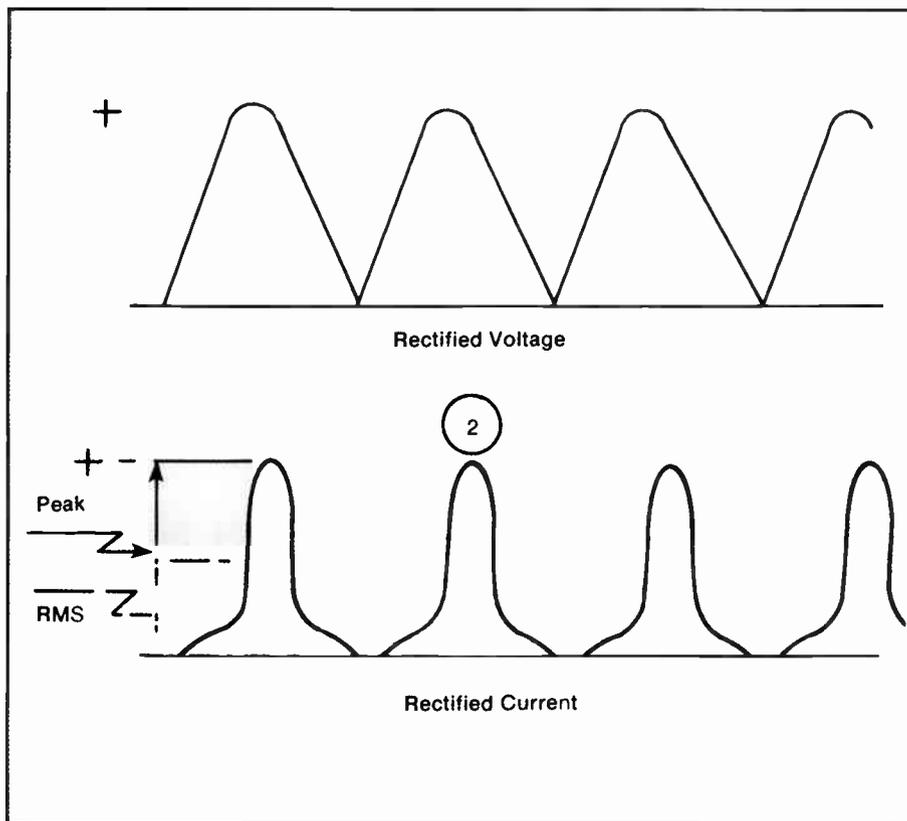
in less than 6 milliseconds (less than one-half cycle) causing essentially no interruption in power. In addition, a properly designed UPS will always transfer the load in the proper phase relationship, thus eliminating the loss of time related to saturation of load inductances.

## Power and Load Considerations

It is important for the user to realize that any secondary power source has limitations as to the amount of load current it can supply to a critical load. Designers of signal conditioning equipment, microwave transmitters and receivers, and other types of similar and related equipment have

Voltage and current waveforms looking in at points 1, 2, and 3 would look as follows for this type of load:





Though peak current 2 is not normally a limiting consideration of the power line, it generally is a limiting consideration of an electronic power source such as a UPS. It therefore follows that the user of a UPS must be aware of the total requirements of his equipment and not just the RMS (approximately average) requirement.

### Batteries and Battery Chargers

Two of the most critical items in standby equipment often get little consideration from the designer and

virtually none from many users. No standby or UPS system can provide critical back-up service if the batteries are dead when an outage occurs.

It is very important that the customer make a correct battery selection for a standby system. There is a great deal of confusion surrounding the question of "Which type of battery is best for this application?"

There is a very wide selection of batteries corresponding to a wide selection of uses. Some criteria for battery selection are:

1. Maintenance free characteristics

2. Deep cycle capability
3. Long life
4. High current capability (200 amperes or more)
5. Good standby characteristics
6. Size & weight characteristics

The ideal battery for standby power systems would be a battery that would be totally maintenance free, have ideal and maximum deep cycle characteristics, would not need replacement for 20 years, could source up to 300 amperes at a constant terminal voltage until exhausted, would require no auxiliary charging (trickle charging) once complete recharge is achieved, and would provide 100 ampere hours of capacity in a 12 volt unit that is the size of a standard automobile battery.

#### 1. Maintenance Free Characteristic

A battery that is "maintenance free" would be one that **never** requires the addition of water. Some batteries are presently manufactured that do not even have filler caps. However, virtually all batteries of interest dissipate water, including those that are "maintenance free" and even those that use a jelled electrolyte. The claim that they are "maintenance free" stems from the fact that the water dissipation rate is very low, the manufacturer adds an excess reservoir above the active elements, and the expected life of the battery is less than the depletion rate of the reservoir.

#### 2. Deep Cycle Capability

A "deep cycle" battery is one that is designed to supply current continuously until the total supply of stored energy is exhausted, (or nearly so), be recharged (replenished with a new supply of energy), and subsequently be called upon to repeat this process many times.

#### 3. Long Life

A long life battery is one that can be expected to provide its full range of services for as long as 20 years. Such batteries are readily available for certain applications where other criteria are restricted.

#### 4. High Current Capability

A battery designed for high current capability is one that can supply 200 to 500 amperes of current while maintaining an acceptable terminal voltage. Virtually all automotive batteries have this capability.

#### 5. Good Standby Characteristics

A battery with good standby characteristics would be one that would be capable of maintaining its energy

storage over long periods of time with little or no dissipation of stored energy and with no deterioration of physical or chemical properties. This battery would have a very low self discharge rate and very low grid corrosion when operating in the "float" mode.

#### 6. Size and Weight Characteristics

The weight of a battery is primarily a function of its "electrical size and intended function, i.e., all 12 volt 80 ampere hour automotive batteries have about the same weight. This is because their "electrical size" is a function of the amount of lead and electrolyte contained in the battery's active area. The only differences relative to weight would be the case and the internal non-active parts. On the other hand most batteries designed primarily for standby service have thicker plates, fewer of them, and have a lower terminal voltage (6 volts or less). Therefore a standby (stationary) battery rated at 6 volts, 80 ampere hours may be as heavy and as large as a 12 volt 80 ampere hour automotive battery. Therefore, an application requiring a 48 volt battery

bank would require 8 or more batteries and weigh about twice as much. Where space and weight are primary considerations, these batteries might not be totally suitable.

#### Automotive & Marine Batteries

Consumer batteries come in two basic varieties—SLI and Deep Cycle. The SLI (starting, lights, ignition) might be called a sprinter. It is designed to supply a powerful jolt of 300 to 500 amps. of current for 10 to 30 seconds. That is what you need to start your car—especially on a cold morning. The deep cycle battery is more like a distance runner. It is designed to deliver a much smaller amount of current—typically only 5 to 15 amps. over a very long period—four, six, even up to eight hours. (This is typical for some marine batteries). Deep cycle batteries are designed to operate over the top 50-80% of their capacity, whereas the SLI is designed to operate in the top 20-25% of its capacity.

#### How Lead-Acid Batteries Work

To understand how batteries are

designed to produce such different discharge characteristics, a review of what goes on inside when you press the starter or flip on the lights would be helpful.

Each cell in a battery consists of a sandwich of positive and negative plates with separators between them. The negative electrode is made of sponge lead. The positive plate is lead peroxide. The plates are submerged in a solution of about 35 percent sulfuric acid and water—the electrolyte.

To create an electric current, the circuit must be completed between the positive and negative plates. An electrochemical reaction between the electrolyte and the plates releases electrons to flow through the load and do the work—start a car or supply power for the lights. The reaction forms lead sulfate at both plates. When the acid is partially exhausted by combining with the lead plates, the battery can no longer deliver an electrical current at the desired voltage—it's discharged.

To recharge a battery, current must be passed through it in the direction opposite to the flow of current when the battery is doing work. That decom-

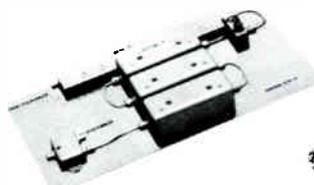
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poses the lead sulfate, which is expelled from the plates and returned to the electrolyte to restore it to its original strength. The plates also return to something near their original composition and are ready to deliver electricity.

For a battery to produce the terrific jolt of energy needed for cranking a car, a large area of the active materials (lead and lead peroxide) must be exposed to the action of the electrolyte. This is accomplished by using thinner plates (more of them can be packed in), and by adding expanders to the active materials to increase the porosity of the lead and lead peroxide.

This increased current-producing capacity doesn't come free. It results in a plate that can shed active materials easily if the battery is deeply discharged. Plates expand during discharge due to a buildup of lead sulfate and can become warped and begin the shedding process. Batteries constructed specifically for deep-discharge performance, on the other hand, have heavier plates with denser active materials to withstand frequent deep discharging. But they can't deliver the sudden bursts of current like an SLI.

### Battery Life & Capacity Relative to Temperature

Battery charge (ampere hours available at full charge) is directly proportional to temperature in about the following relationship for all lead acid batteries.

Temperature	Capacity
120° F	112%
77° F	100%
60° F	90%
20° F	63%
0° F	48%
-20° F	30%
-48° F	0%
-80° F	Freezing point at full charge
-30° F	Freezing point at ½ charge

Battery life is inversely proportional to temperature (though not linearly) because of the corrosion factor at the grids. Corrosion factor is relatively small below 60° F but accelerates rapidly at a battery temperature above 110° F. (The battery temperature will generally trail the ambient by about 10° at the extreme of each day.) The grid corrosion rate doubles at about

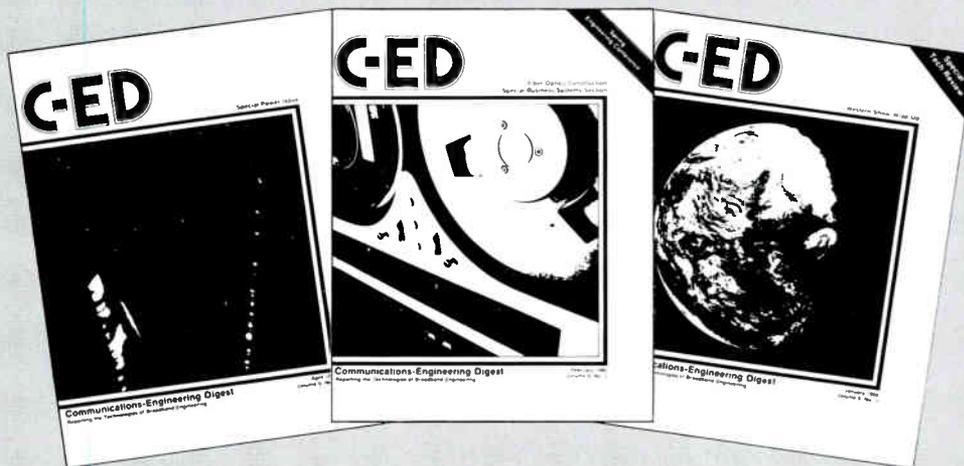
every 18° F increase in temperature above 77° F. In actual practice this would mean a battery user in Phoenix, Arizona, could expect about 65% as much battery life as a user in Waterbury, Connecticut.

### Battery Capacity Relative to Rate of Discharge

Battery capacity is inversely proportional to rate of discharge (though not linearly) and is usually rated on the basis of 20 hours for automotive and marine batteries and 8 hours for standby batteries. For instance a battery rated at 20 ampere hours capacity would deliver 1 ampere for 20 hours, but would deliver 10 amperes for only about 1¼ hours before reaching the same terminal voltage. This phenomena is caused by electron and ion starvation at the electrolyte plate interfaces. Further increasing the current demand will reduce this percentage at an increasing rate.

### Summary of Above

1. Standard automotive batteries (SLI) are not recommended and will rarely give satisfactory service.



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2. Deep cycle marine batteries give substantially superior service over automotive batteries and should last 2-4 years with a properly designed battery charger. These are lead anti-mony units and will require some maintenance (increasing with age).

3. Lead calcium stationary batteries with liquid electrolyte are recommended over all others. These units will ordinarily provide trouble free service up to 20 years or more with extremely low maintenance. (About every 2 years.) The cost of these batteries is about 5 times that for deep cycle marine batteries.

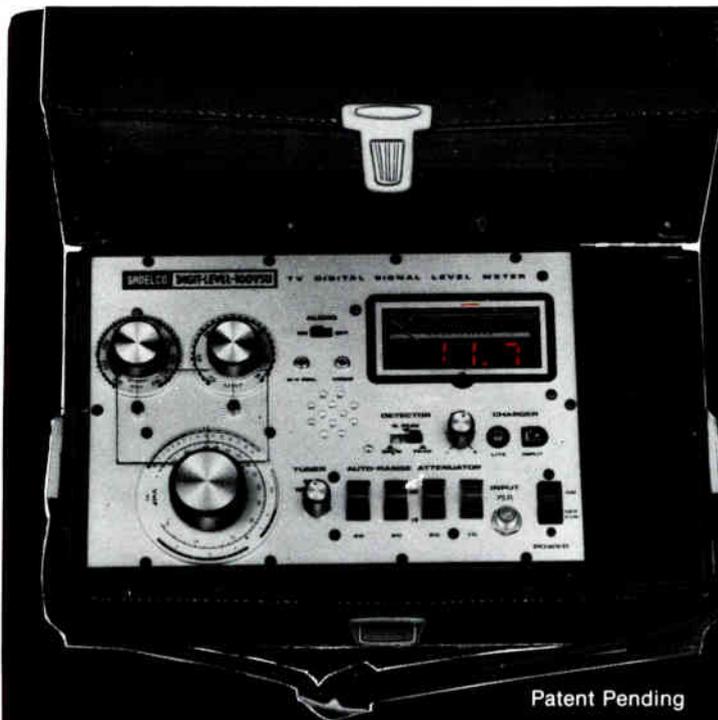
4. In typical CATV standby power applications semi-deep cycle lead cadmium batteries will give superior performance over any type in a comparable price range. These batteries are maintenance free and should give 3-5 years service with a properly designed battery charger. If the application requires frequent (once or twice per week) and deep discharging (75% of capacity) deep cycle batteries will give superior service.

5. Lead calcium jelled electrolyte batteries require no maintenance, are much more expensive than liquid electrolyte, and generally have a considerably shorter life (6-8 years) than lead calcium standby batteries.

6. Most other types of batteries such as nickel cadmium or completely sealed liquid electrolyte batteries have other disadvantages and do not constitute a good choice for this type application.

Selection of a proper battery must be augmented by the proper design and adjustment of the battery charger. For all batteries of lead-acid construction (lead-calcium, lead-antimony, lead-cadmium, gel-cells, etc.) it is necessary to pass a reverse current either continuously or periodically through the battery in order for it to remain "healthy" even after it has been fully charged. This "trickle charging" holds sulphate ions in solution that would otherwise "plate out" as a result of "self-discharge," a phenomenon of all lead acid batteries. These plated out sulphate ions left alone will harden or crystallize over a period of weeks or

months and will ultimately immobilize the battery. On the other hand, over-charging (trickle charging) at an excessive rate will cause excessive grid (plate) corrosion, primarily at the positive plate. It therefore follows that there is an optimum condition or conditions for the maintenance of the battery. This optimum point occurs as a voltage condition rather than a current condition and is approximately 2.4 volts per cell for lead calcium and lead cadmium batteries and about 2.2 volts per cell for lead antimony batteries. (14.1 volts and 13.2 volts respectively for 12 volt batteries). It is very important that this voltage be held tightly in continuous charging systems for long battery life and reliability. Even longer battery life is possible with certain types of batteries where intermittent battery maintenance is provided by cycle charging for 15-20 minutes per day once full battery charge is achieved. Since water evolution occurs after batteries reach full charge, cycle charging of lead antimony batteries increases life and lowers battery maintenance, thus making their use more desirable than with continuous charging systems. C-ED



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An aerial photograph of a large industrial facility, likely a cable production plant, situated in a green, wooded area. The facility includes several large buildings, parking lots, and a winding road. In the foreground, a person's hand is visible, holding a black remote control device. The text is overlaid on the lower-left portion of the image.

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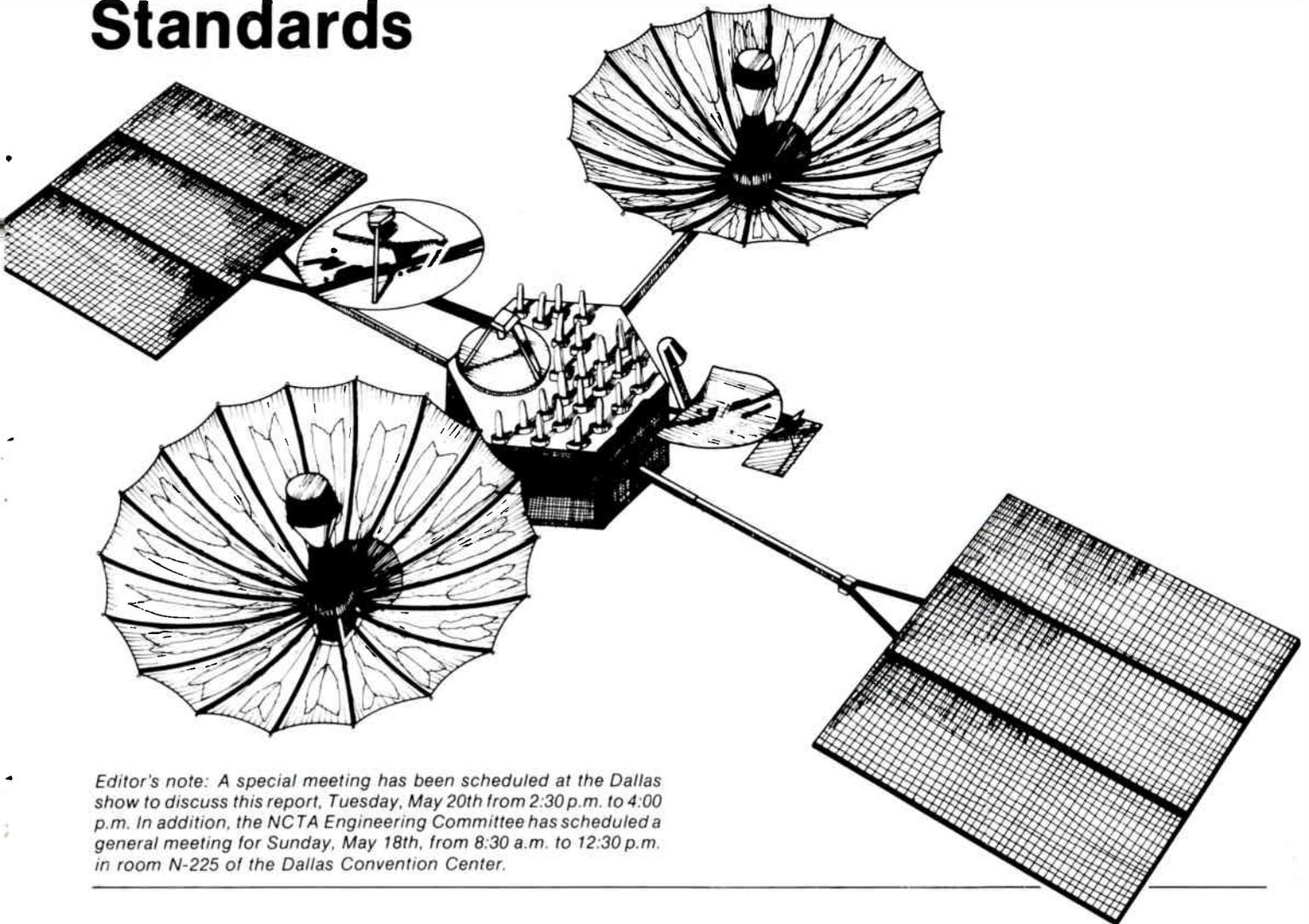


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# Satellite Transmission Standards



*Editor's note: A special meeting has been scheduled at the Dallas show to discuss this report, Tuesday, May 20th from 2:30 p.m. to 4:00 p.m. In addition, the NCTA Engineering Committee has scheduled a general meeting for Sunday, May 18th, from 8:30 a.m. to 12:30 p.m. in room N-225 of the Dallas Convention Center.*

*The following is a report in two parts on the subject of satellite transmission standards, drafted and approved by the satellite subcommittee of the NCTA's engineering committee. The NCTA is presently soliciting comments on this report from all sectors of the cable industry.*

*Part one is the "standard" itself, and provides modulation parameters for basic television transmission. Adherence to these standards by the senders will assure uniform levels of video and audio at the receiving end of these transmissions. Part two is a "good engineering practice bulletin" which provides guidelines for the transmission of additional data by means of subcarriers.*

*Comments on these documents should be made in writing and sent to Chris Weaver at the NCTA, 918 16th Street, N.W., Washington, D.C. 20006.*

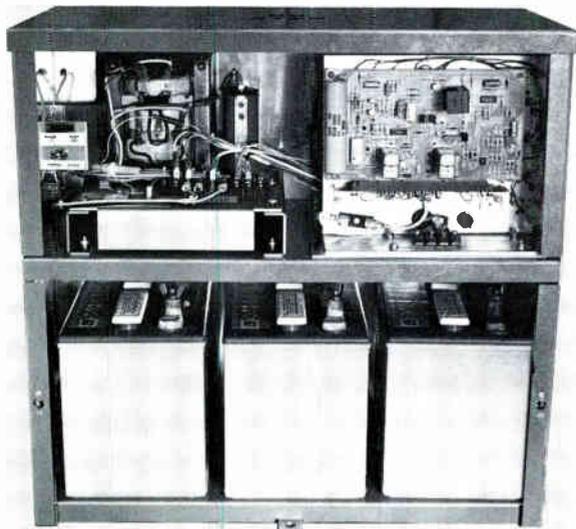
*The NCTA would like to thank the following members of the satellite subcommittee for their contributions in preparing this report: David Alvarez, Microdyne; Alex Best, Scientific Atlanta; Frank Bias, Viacom; George Gilbert, Home Box Office; Edward Basista, Warner Cable; Edward Taylor, Southern Satellite Systems; Harold Rice, RCA Americom; Jim Stilwell, Times Mirror. Special thanks also go to Norman Weinhouse of Hughes Microwave for his exemplary leadership of the satellite subcommittee.*

## **Part One Modulation Parameters Used In Satellite Television Transmission**

This document is intended to provide a standard for the modulation parameters used in satellite transmission of

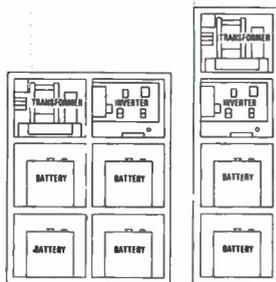
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television signals intended for use by CATV systems. The television signal to be transmitted consists of 525 Line NTSC color television video and associated audio signals. This standard deals primarily with analog transmission using angle modulation.

The satellite delivery system covered by this standard is generally the type used in U.S. Domestic Service, and is characterized as containing transponders spaced 40 MHz apart on horizontal or vertical polarization. The emission designator of the satellite transponder is 36000E9. The microwave frequency range is 5925 to 6425 MHz on the uplink and 3700 to 4200 on the downlink.

Standards are given only for modulation parameters, so that the receiving stations can be assured of compatibility between sources of programming. No attempt is made herein to prescribe ultimate performance parameters. However, with a well designed receiving earth station these standards will assure not only compatibility between sources of programming, but will assure a minimum of degradation, and interference when added services by subscribers are included with the basic television service. Standards for the additional subcarriers are not included here. Instead, they will be treated in a separate bulletin to be published at a later date.

Basic television service is defined, herein, as transmission of 525 line NTSC color video and the associated monaural audio.

The 525 line NTSC video shall be frequency modulated as a direct baseband signal of the microwave carrier.

- A. Peak-to-peak deviation of the main carrier by video for 100 percent modulation (modulation waveform is sync tip to reference white) :21.5 MHz
  - B. Baseband Preemphasis :CCIR, REC. 405-1
- The TV associated audio shall be transmitted on an FM subcarrier above the video.
- A. Center frequency of audio Subcarrier :6.8 MHz

- B. Deviation of main carrier by the subcarrier (100 percent modulation, one side peak) :2.0 MHz
- C. Highest audio frequency :15 MHz
- D. Deviation of subcarrier by audio (100 percent modulation, one side peak) :75 MHz
- E. Audio baseband preemphasis :75 Microseconds

Adjustment of deviations given above shall be made with sine wave test tones using either carrier null or Bessel sideband nulls. A suggested method is given in the appendix that follows.

- A. Deviation of Main Carrier by Video
  1. Insert a 760 kHz (preemphasis crossover frequency) sine wave signal to the input of the video modulator at a level of 60.3 millivolts RMS.
  2. Observe modulated signal, (IF or RF) on a spectrum analyzer and adjust video deviation control for first carrier null.
  3. Insert video signal at 1.0 volt (Sync. tip to reference white)

Development:

First carrier null occurs at modulation index (m) of 2.405.

$$F = f_m \times m = .76 \times 2.405 = 1.827 \text{ MHz}$$

To obtain 10.75 MHz deviation, a 1 Volt p-p signal would have to be reduced by

$$\frac{10.75}{20 \log 1.8278} = 15.39 \text{ db or } .70 \text{ volts p-p which is } 60.3 \text{ mv RMS}$$

**B. Deviation of Main Carrier by Subcarrier**

1. Observe modulated signal (IF or RF) on a spectrum analyzer.
2. Terminate the audio input to the subscriber modulator, and terminate the video input to the video modulator.
3. Adjust subcarrier injection level for 1st carrier null of main microwave carrier.
4. Measure the subcarrier (6.8 MHz) voltage at the monitor point for this signal.
5. Reduce the voltage at this test point by 18.25 db.

Development:

$$\begin{aligned} \Delta F &= f_m \times 2.405 \text{ for first carrier null} \\ &= 6.8 \times 2.405 \\ &= 16.354 \text{ MHz} \end{aligned}$$

$$\text{for } \Delta F = 20 \log \frac{16.354}{2} = 18.25 \text{ db}$$

**C. Deviation of Subcarrier by Audio**

1. Inject 400 Hz audio signal to input of subcarrier modulator at a level corresponding to peak program level.
2. Observe modulated signal at 6.8 MHz subcarrier output test point with spectrum analyzer.
3. Insert an attenuator between audio generator and modulator input of 37.8 db, or reduce the 400 Hz level by 37.8 db.
4. Adjust subcarrier deviation control for 1st carrier null.
5. Remove 37.8 db attenuator, if an attenuator is used in step 3.

Development:

$$\begin{aligned} \Delta F &= f_m \times 2.405 \\ &= 400 \times 2.405 \\ &= 962 \text{ Hz} \end{aligned}$$

$$\begin{aligned} \text{For } \Delta F &= 75 \text{ KHz} \\ \text{Increase in voltage} &= 20 \log \frac{75}{.962} = 37.8 \text{ db} \end{aligned}$$

**Part Two  
Narrowband Services Transmitted Along With  
Television Signals Via Satellite**

It is in the interest of the cable systems receiving satellite TV transmissions to be assured that equipment purchased for this function be compatible with current and future programming. This bulletin addresses these concerns. Actually, the purpose of this bulletin is twofold: (1) We want to provide good practice guidelines to the program suppliers and common carriers who transmit the material, and (2) point out potential degradation to the basic television service in the channel carrying the additional subcarriers. Now, some narrowband services are transmitted by subcarriers in the same baseband as the basic television service. We anticipate widespread demand for these services in the future.

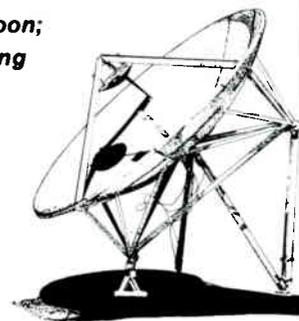
Bear in mind that subcarriers added to a basic TV service increase the occupied bandwidth of the microwave carrier over that which would be occupied without the added subcarriers. Furthermore, the baseband bandwidth is finite,

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and care should be taken in the use of the baseband to avoid potential interference to the basic TV service.

In FM, the occupied bandwidth is a function of the deviation of the carrier and the frequency of modulation. Carson's Rule, although originally postulated for multi-channel telephony radio transmission has historically been applied to TV transmission even though the nature of the video is far different from multi-channel telephony.

In the absence of theoretical analysis, one model which seems to fit, is to add the deviations of the modulating waveforms on a root sum square basis to find the peak composite deviation. Stated mathematically:

$$\Delta F_{comp} = \sqrt{\Delta F_v^2 + \mu \Delta F_e^2 + \Delta F_{sl}^2}$$

where:

- $\Delta F_{comp}$  is the composite peak deviation of the carrier
- $\Delta F_v$  is the peak deviation of the carrier by video signal
- $\Delta F_e$  is the peak deviation of the carrier by the energy dispersal waveform.
- $\Delta F_{sl}$  is the peak deviation of the carrier by the first subcarrier.

Carson's rule stated mathematically is:

$$BW_{reqd} = 2 (\Delta F_{comp} + f_{max})$$

where:  $f_{max}$  is the maximum instantaneous modulating frequency.

It shall be considered good practice to keep the bandwidth within the rated emission designator of the satellite being used. Present day satellites carrying television for cable systems have an emission designator for each transponder of 36,000 F9 or 36 MHz bandwidth.

Using those criteria, the bandwidth associated with a basic TV derive from the NCTA standard presented today is:

$$BW = 2 \left( \sqrt{(10.75)^2 + (1)^2 + (2)^2 + 6.9} \right) = 35.76$$

If a subcarrier at 5.8 MHz with 4.0 MHz peak deviation, and another at 7.4 MHz with 2 MHz peak deviation were added to this transmission, the bandwidth would be:

$$BW = 2 \left( \sqrt{(10.75)^2 + (1)^2 + (4)^2 + (2)^2 + 7.5} \right) = 38.71 \text{ MHz}$$

In order to maintain 36 MHz bandwidth in this case, the deviation of the video could be reduced to 9.23 MHz or 1.32 db reduction in video level.

The center frequency of the subcarrier, the bandwidth occupied and the spacing between subcarriers are extremely important in transmission of subcarriers along with basic TV service.

It shall be considered good practice to select the subscriber center frequencies to avoid intermodulation products which can, when combined with the standard subcarrier frequency of 6.8 MHz and the color subcarrier (3.5 MHz), create interference into the basic TV service.

For example, if two subcarriers are added with equal spacing on either side of the 6.8 MHz subcarrier, the potential exists for third order (triple beat) into the 6.8 MHz subcarrier. Also third order ( $2f_1 \pm f_2$ ) can produce interference into the subcarriers which were added.

It shall also be considered good practice to avoid harmonics of the color subcarrier frequency (7.15 MHz, 10.74 MHz).

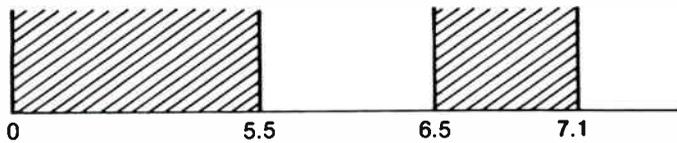
No attempt is made here to restrict the amount of information contained in the additional subcarrier(s) nor is there an

attempt to restrict or constrain the type of modulation on the subcarrier(s). The occupied bandwidth is properly a function of the modulation technique, the desired signal to noise ratio (or bit error rate in the case of digital modulation), signal processing, and frequency or bit rate of the information transmitted.

It shall be considered good practice to design the subcarrier modulation scheme and the subcarrier insertion level so that interference to the basic video and audio is minimized. As a guideline, the following is suggested:

- 1) The added subcarrier insertion level (deviation) shall be no more than 4.0 MHz (6db greater than TV aural subcarrier at baseband) for any one subcarrier.
- 2) The band edges of the added subcarrier(s) shall be:
  - A. No lower than 5.5 MHz
  - B. Outside the range of 6.5 to 7.1 MHz

Baseband Frequency (MHz)



The subcarrier is herein defined as the frequencies between which 99 percent of the modulated subcarrier power is contained when the subcarrier is at rated (100 percent) modulation.

The guidelines provided above will assure a minimum of degradation to the basic television service in a satellite channel. However, some degradation will be experienced depending on the situation existing at the receiving earth station. There are too many variables to list, and virtually impossible to quantify for all possible subcarrier combinations, equipment used, and the condition of the equipment. Only two important examples will be given here.

**Video S/N (Thermal Noise).** As indicated above, the deviation of the microwave carrier may need to be reduced to maintain bandwidth within the satellite transponder emission designator limits. This reduced deviation shows up directly as reduction in video signal to noise ratio since video signal power is directly related to deviation.

Furthermore, if the channel with added subcarriers is time-shared with other satellite channels, the cable system channel is subject to variable luminance levels unless compensation is made when switching to satellite channels.

**Margin to Impulse Noise.** In all FM systems transmitting television, an impulse noise threshold exists. The impulses into a video display are the random result of phase reversals due to the random vector addition of thermal noise and carrier signals. The carrier-to-noise ratio at which this impulse threshold exists is an extremely complex function of the type of equipment, its condition, the modulation waveforms, and the deviation produced by the modulating waveforms. Experiment by various equipment manufacturers has shown that the margin to threshold can be degraded as much as 2db with the addition of two subcarriers with parameters as given in the example above where one is at 5.8 MHz with 4.0 MHz deviation, and the other is at 7.4 MHz with 2.0 MHz deviation.

The impact of this degradation can be severe if a small aperture earth station is in a weak satellite signal location.

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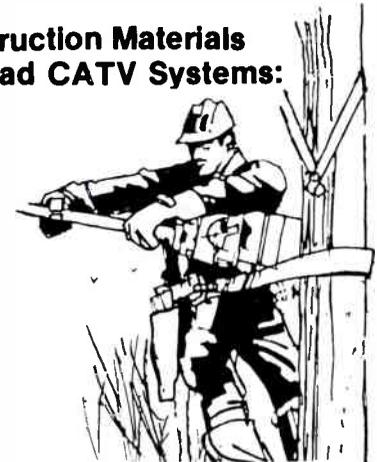
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# Cable Programming for May

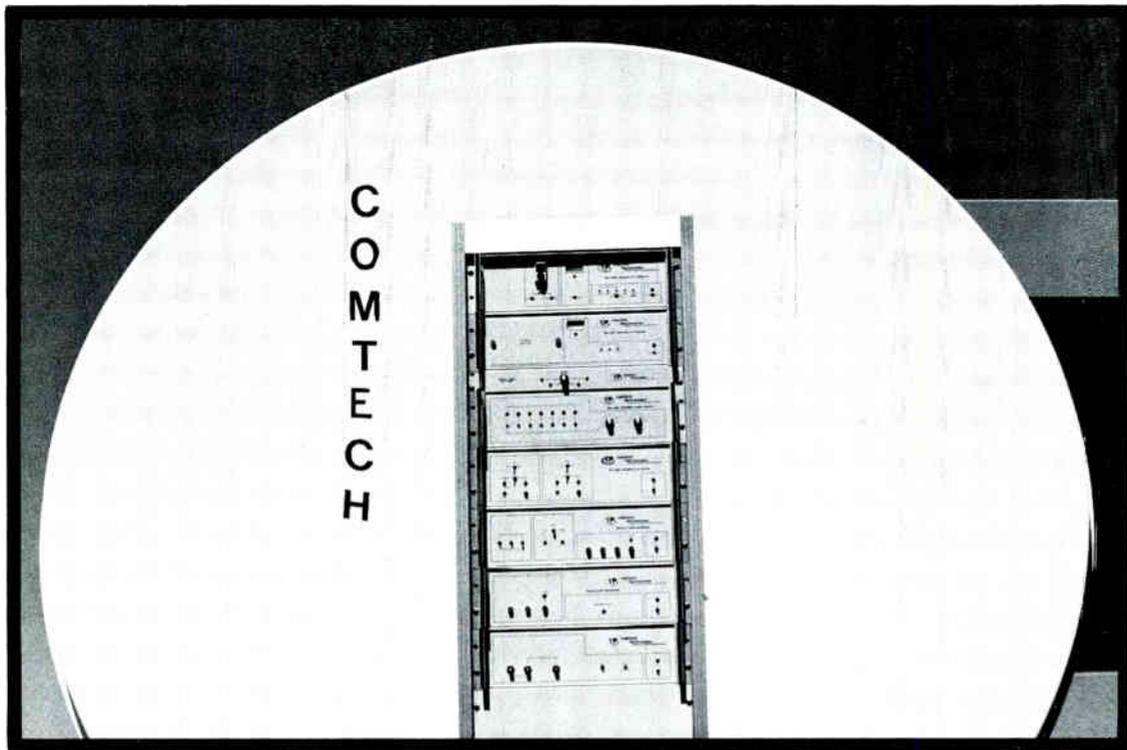
Signal	Day	Start/Stop	Alert Tones	Satellite/ Transponders	Signal	Day	Start/Stop	Alert Tones	Satellite/ Transponders
<b>C-SPAN</b> (times approximate) Mondays 9:00 a.m. to 6:00 p.m. Tuesdays 10:30 a.m. to 6:00 p.m. Wednesdays 9:30 a.m. to 6:00 p.m. Thursdays 9:30 a.m. to 6:00 p.m. Fridays 10:30 a.m. to 5:00 p.m.					195*/# F1, #9				
<b>CBN</b>					24 hrs. No F1, #8				
<b>ESPN</b>					F1, #7				
Monday thru Thursday 6:00 p.m. to 4:00 a.m. Friday, 6:30 p.m., to following Monday, 4:00 a.m.									
<b>Front Row</b>					2:30 pm-2:30 am 481*/# E,C F1, #12 P,M F1, #10				
<b>HBO</b>	May 1	6:00	12:52	Program	F1, #24				
	May 2	6:00	12:58	729*/#	F1, #22				
	May 3	3:00	1:42	Scramble	F1, #23				
	May 4	3:30	1:15	835*/#	F1, #20				
	May 5	6:00	1:29	Duplication					
	May 6	5:00	1:07	940*/#					
	May 7	6:00	1:29	Take-2 E.					
	May 8	6:00	2:15	592*/#					
	May 9	6:00	2:49	Take 2 W.					
	May 10	3:00	2:44	681*/#					
	May 11	3:30	1:43						
	May 12	6:00	1:12						
	May 13	5:30	1:49						
	May 14	6:30	2:19						
	May 15	5:00	1:15						
	May 16	6:00	2:49						
	May 17	3:30	2:29						
	May 18	3:00	12:47						
	May 19	5:30	2:19						
	May 20	5:30	1:58						
	May 21	5:00	2:06						
	May 22	5:00	1:43						
	May 23	5:00	2:30						
	May 24	3:30	3:04						
	May 25	2:00	1:28						
	May 26	2:00	1:03						
	May 27	5:30	1:57						
	May 28	5:30	2:00						
	May 29	5:30	1:59						
	May 30	5:30	2:31						
	May 31	3:30	2:19						
<b>HTN</b>					8 pm-10 (11) pm 517*/# F1, #21				
<b>KPIX (time permitting)</b>					2-4 hrs. per day No F1, #1				
<b>KTVU</b>					7 am-1 am (weekdays) No F1, #1 7 am-4 am (weekends)				
<b>MSG Sports</b>					438*/#† F1, #9				
	May 2	8:30 p.m.							
	May 13	10:30 p.m.							
	May 19	8:30 p.m.							
	May 21	9:00 p.m.							
	May 23	8:30 p.m.							
	May 24	2:00 p.m. to 4:00 p.m.							
		8:00 p.m. to 10:00 p.m.							
	May 26	1:30 p.m.							
This schedule does not include Thursday night baseball, which is under separate contract.									
<b>Modern Talking Pictures</b>					12 pm-5 pm (weekdays) 048*/# F1, #22 7 am-12 pm (weekends)				
<b>Newstime</b>					24 hrs. 276*/# F1, #6				
<b>Nickelodeon</b>					9 am-11 pm (weekdays) 749*/# F1, #11 8 am-11 pm (weekends)				
<b>PTL</b>					24 hrs. No F1, #2				
<b>Reuters</b>					4:00 a.m. to 7:00 p.m. No F1, #18 Monday thru Friday				
<b>SPN</b>					429*/# auto switch to commercial, F1, #21 10 pm-8 pm on/off respectively (Mon.-Sat.) 517# end SPN, begin HTN 24 hrs. (Sun.) 517* end HTN, begin SPN				
<b>Showtime</b>	May 1	3:30	2:15		576*/#††	E, C, F1, #12;			
	May 2	3:30	3:30			P, M, F1,			
	May 3	1:15	3:30						
	May 4	1:30	2:32						
	May 5	3:30	2:32						
	May 6	3:30	2:10						
	May 7	3:15	2:02						
	May 8	3:30	2:32						
	May 9	3:30	3:30						
	May 10	1:15	3:00						
	May 11	1:30	2:53						
	May 12	3:30	2:23						
	May 13	3:30	3:20						
	May 14	3:15	2:47						
	May 15	3:00	3:23						
	May 16	3:30	4:03						
	May 17	12:45	2:56						
	May 18	1:30	2:18						
	May 19	3:30	2:36						
	May 20	3:30	3:20						
	May 21	3:15	2:36						
	May 22	3:30	2:30						
	May 23	3:30	2:07						
	May 24	1:15	2:40						
	May 25	1:30	2:07						
	May 26	3:30	2:30						
	May 27	3:30	1:55						
	May 28	3:15	3:15						
	May 29	3:30	2:50						
	May 30	3:30	2:33						
	May 31	1:15	2:48						
<b>SIN</b>					24 hrs. No Westar II #6				
<b>The Movie Channel</b>					24 hrs. 311*/#E. F1, #5 519*/#W.				
<b>Trinity (KTBN)</b>					24 hrs. No F1, #14				
<b>WGN</b>					5:42 am-3 (3:30) am No F1, #3 (Mon.-Thurs.) 24 hrs. Sat. & Sun. Ends 3 am on Sun.				
<b>WOR</b>					24 hrs. F1, #17				
<b>WTBS</b>					24 hrs. No F1, #6				

E = eastern  
 C = central  
 M = mountain  
 P = pacific

All program times are listed for the eastern time zone, unless otherwise noted.

† Commercial substitution 601\*/#; Thurs. baseball 706\*/#.  
 †† On-line 679\*/#; off-line 753\*/#; access 843\*/#.

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- + RCV-450RT Remote tuner panel
- + RCV-450LS LNA protective switch
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### New Products Booklet Issued by GTE Lenkurt

GTE Lenkurt Incorporated has issued a new Microwave Radio Products booklet, which describes the company's broad line of microwave radio systems for the transmission of video, voice and data.

The illustrated booklet provides a comprehensive description of the types 70F2, 79F1, 775 and 778 analog transmitter-receivers, the 79F1-D Digital Radio System and the 700F1 Repeater System. It also provides basic information on FCC and CCIR frequency bands, as well as fundamentals of heterodyne, baseband and RF repeater operation.

The 20-page document is divided into sections covering each radio product, including FCC data and complete technical summaries. Descriptions of such auxiliary microwave radio subsystems as alarm, order wire and multiline switching assemblies are also included.

For a copy of the Microwave Radio Products booklet, write GTE Lenkurt Incorporated, Dept. C720, 1105 County Road, San Carlos, Calif. 94070.



### Two New Catalogs Available From Innovative Television Equipment

Two new catalogs covering their entire line of video camera support equipment are now available from Innovative Television Equipment.

According to ITE president Bert Rosenberg, a four-page brochure presents the company's line of audio/visual and closed circuit television support equipment, while an eight-page catalog details ITE's professional broadcast tripods, pedestals, dollies, heads and accessories.

Either or both catalogs may be obtained by requesting them on company letterhead from Innovative Television Equipment, P.O. Box 681, Woodland Hills, CA 91364.

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Setting the pace for the industry, Microdyne will continue to design equipment with provisions for system expansion eliminating costly adjustments at a later date. Also, in response to market needs, a new facility dedicated to satellite communications has commenced full scale operation in Ocala, Florida to guarantee continued customer satisfaction.

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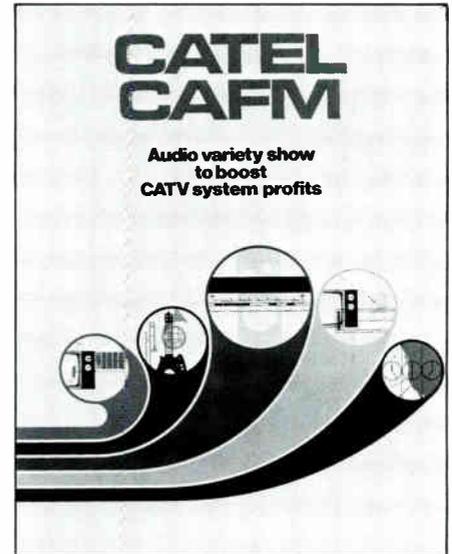
491 Oak Road • P.O. Box 7213 Ocala, Florida 32672 (904) 687-4633  
Kansas City Office  
12204 N.W. 66th Street Kansas City, Missouri 64152 (816) 891-7030

## Booklet Unveils New Source Of CATV Revenues

By adding a variety of FM services, a number of CATV systems in the U.S. and Canada have been able to increase revenues per subscriber, as well as attracting hundreds of new subscribers. A six-page illustrated brochure just published by Catel, *Catel CAFM*, explains how this new technology works and how CATV systems can take advantage of it with a relatively small investment.

The brochure shows how up to 50 channels of radio programming can be carried into subscribers' homes along with normal TV programs by using Catel's advanced CAFM technology. This programming can include off-air FM broadcasts, originated stereo music, time, weather, short wave, police, fire, and aviation channels, satellite music service, pay-TV sound, and TV-sound simulcasts.

Copies of the new CAFM brochure can be obtained by writing Catel, 1400-D Stierlin Road, Mountain View, California 94043.



## New General Electric Professional Large Screen TV Projector Brochure

Major applications of large screen television projection are described and illustrated in the new General Electric Professional Large Screen Television Projector full line brochure.

The six page, four-color brochure explains how General Electric Professional Large Screen Projectors are being used in the fields of education, business, aerospace/defense, entertainment, broadcasting, and teleconferencing.

For copies, call J.P. Gunderson, (315) 456-2562/2533 or write: General Electric Company, Video Display Equipment Operation, Electronics Park, Bldg. 6, Room 205, P.O. Box 4840, Syracuse, N.Y. 13221.

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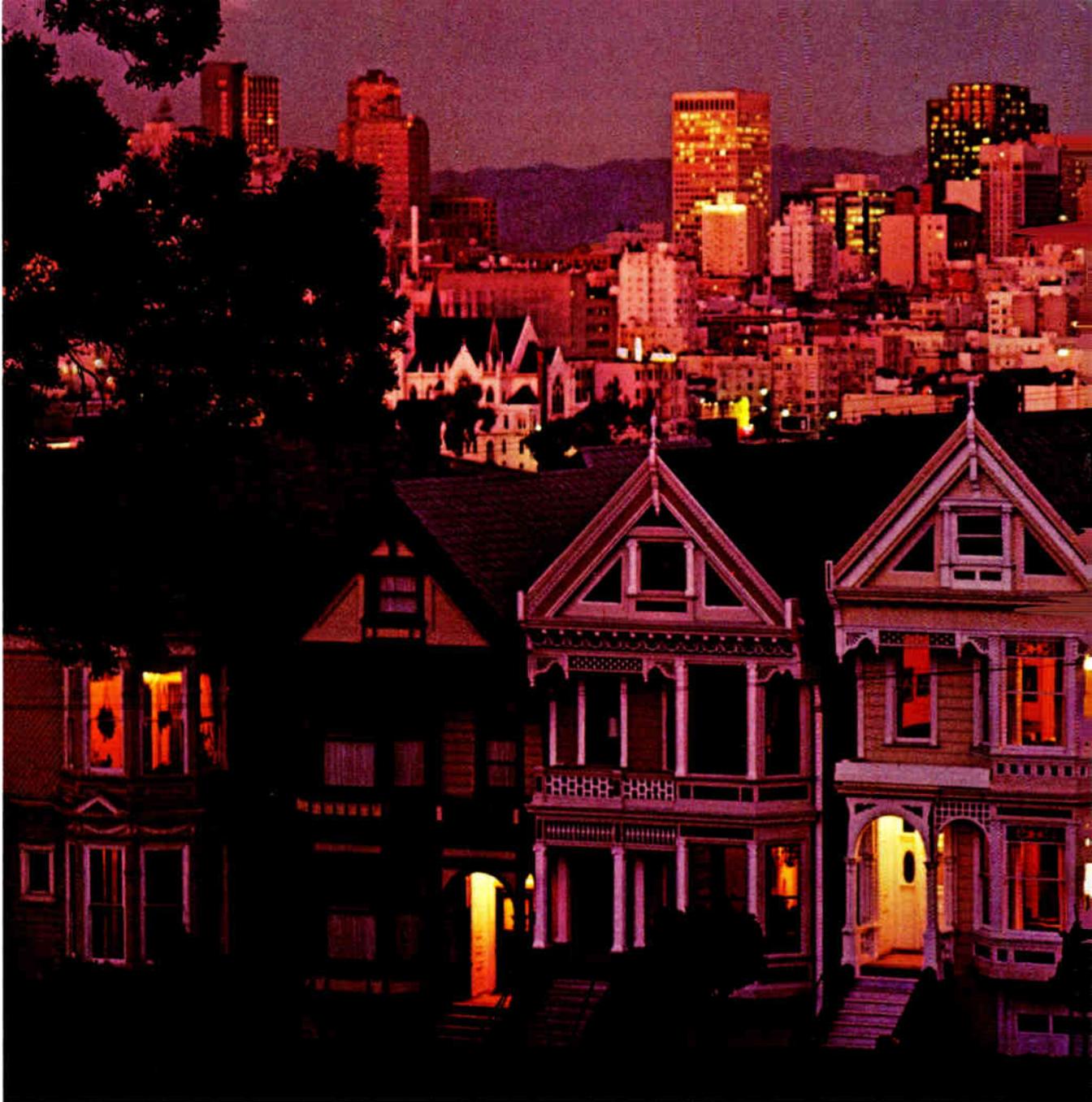
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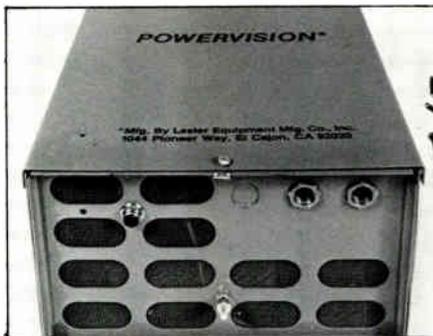
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## Power Supplies

### CATV Power Supply by Powervision

Lester Equipment Manufacturing Co., Inc., has introduced a new 14 amp power supply which yields either 30 or 60 VAC. The unit features an input circuit breaker, transient protection, RF filter, pilot light, modular construction, and an easily disconnected power transformer that eliminates dangerous back-powering of the utility lines. For further information, contact Lester Equipment Manufacturing Co., Inc., 1044 Pioneer Way, El Cajon, California 92020, or call (714) 588-1272.



## Earth Station

### NEC 12 GHz Domsat Geared for Direct Broadcast Market

The compact, low-cost NEC Model 790 satellite receiver is designed for individual TV reception, as well as community CATV and rebroadcasting reception. This second-generation, 5-channel receiver achieves a low noise temperature of 500 K, and features baseband and normal VHF TV channel outputs, and low power consumption: 11 Watts AC.

NEC first developed direct receivers in 1973, in cooperation with NHK (Japan Broadcasting Company). Two years later, one-channel NEC receivers were field-tested using the Communication Technology Satellite. As a result of this experience, the Model 790 installs simply and easily, and is maintenance-free. It includes 1-meter dish antenna, low noise converter, IF cable and FM-AM converter. A 4 GHz Domsat is also available from NEC.

For additional information please contact: Mr. Richard Dienhart, NEC America, Inc., Broadcast Equipment Division, 130 Martin Lane, Elk Grove Village, Illinois 60007, (312) 640-3792.



## Line/Headend

### SAW Filter Heterodyne Processor from Phasecom

Phasecom will introduce its new SAW Filter Heterodyne Processor at the 28th Annual NCTA Convention and Exposition to be held May 18-21 in Dallas, Texas.

The Surface Acoustic Wave (SAW) Filter, having proven its performance and reliability advantages in high quality modulators, has now been incorporated into Phasecom's new Model 2306 Heterodyne Processor.

The processor provides complete video passband response of  $\pm 0.5$  dB and  $\pm 25$  nsec. group delay, giving greater signal transparency, and drift-free adjacent channel rejection of better than 65 dB.

The Model 2306 also features greater interface flexibility. External IF links provide easy emergency alert access and the internal standby carrier can be remotely activated for modulation with an external video/4.5 mHz audio combined signal.



This model also incorporates Phasecom's "Automatic Notch Control" circuits which maintain the constant visual/aural carrier ratio, preset by front panel control. Only the amount of aural carrier attenuation needed to attain the desired carrier ratio is introduced at the IF passband, thus avoiding the conventional trap circuits that give rise to excessive group delay and color subcarrier attenuation.

The Model 2306 Heterodyne Processor underscores Phasecom's continuing commitment to the highest performance/price ratio in the industry today.

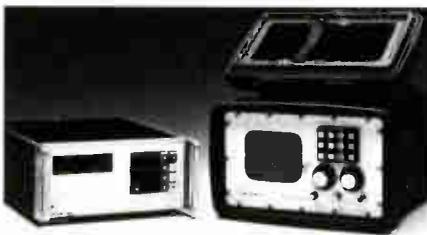
For further information, contact: Phasecom Corporation, 6365 Arizona Circle, Los Angeles, California 90045, (213) 641-3501.

### New Magna Line of Amplifiers, Converter/Descramblers from Magnavox

Magnavox CATV Systems, Inc., has announced it will introduce the new MAGNA™ line of amplifiers and converter/descramblers at the 1980 NCTA Convention and Exposition in Dallas. The two new converter/descrambler units have been designed as attractive furniture accessories and feature touch control channel selection, LED display and built-in descrambler.

The Magna 440 amplifier includes a new housing and module chassis which is designed for expandability to 440 MHz. Operators of new systems, committed to wider coverage, can order the unit initially with the 440 MHz bandwidth. The new amplifiers are compatible with current and future system needs and feature upgradability to include System Sentry™, status monitoring, and return path feeder disconnect and code operated switches. Many existing systems can be upgraded to 440 MHz by plugging in new modules and passive component assemblies. This allows six more usable channels than 400 MHz amplifiers.

The Magna 58 converter/descrambler converts all usable channels in the 54-440 MHz bandwidth and is capable of descrambling all channels independently. As an extra feature, each of the 58 channels may be used on a time-shared, premium or non-premium



### 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 \$7,150 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.

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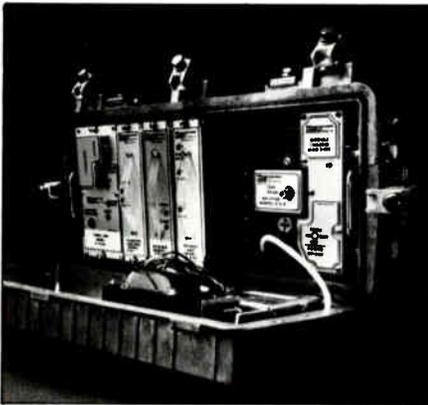


## When your subscribers have 52 channels to watch, so will you.

basis. With minor modification, the Magna 58 is compatible with standard, HRC, or ICC head-end equipment. For future expansion it features upgrading to full addressability.

Magna 9 converts mid-band channels so a standard 12 channel system may operate with up to 21 channels. It can descramble individual or grouped channels and features optional upgrading to full addressability. Operators may now sell either pay TV subscriptions or pay packages with the Magna 9.

For further information, visit booth 200/301 at the NCTA Convention and Exposition or contact Magnavox CATV Systems, Inc., 100 Fairgrounds Drive, Manlius, New York, 13104. Telephone 315-682-9105.



### Cable Equipment

#### Lashing Wire Grip Now Available From General Machine Products

A new lashing wire grip which makes the temporary securing of lashing wire to suspension strand a rapid, effortless operation is now available from General Machine Products Co., Inc.

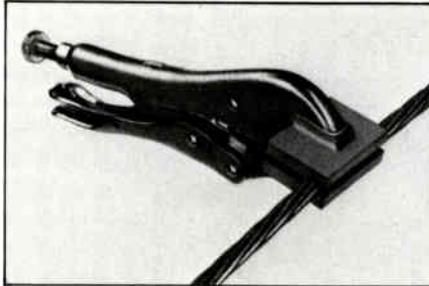
GMP's new Speedigrip lashing wire grip is designed to secure lashing wire to the strand before releasing tension in the wire, or for temporarily fastening wire prior to lashing.

The new Speedigrip features exceptional ease of operation. The grip incorporates a single groove which accommodates all sizes of strand. In use, the handle of the tool is merely squeezed together, automatically locking the grip in place on the wire and strand. An adjusting screw permits the craftsman to vary the opening of the grip jaws.

The new Speedigrip can be used

with all sizes of lashing wire but should be used as a tool, not as a permanent installation. The unit is ruggedly constructed of corrosion-resistant steel for long, trouble-free service life.

For additional information on the new GMP Speedigrip, contact General Machine Products Co., Inc., 3111 Old Lincoln Highway, Trevose, Pennsylvania 19047, (215) 357-5500.



### Video

#### Panasonic Video Systems Shows New B/W Monitor

Panasonic Video Systems has introduced a compact, economical, desk-top black and white monitor that's ideal for use in closed circuit TV application or in a TV studio.

Model TR-930 features a nine inch screen, and employs a bipotential picture tube to display sharp, highly detailed pictures. Horizontal resolution is 700 lines at center. The unit's operating controls (power, contrast, brightness, V-hold, H-hold) and adjustments (V-height and V-linearity) are conveniently located on the front panel. On the rear panel are BNC connectors for video input, and a H-Z/75-ohm termination switch.

Model Tr-930 is a single monitor and is housed in an attractive metal cabinet. It is also available in two rack-mount versions: Model TR-931, with a



Model TR-932  
Dual 9" Rackmount Monitor

single monitor and blank panel; and Model TR-932, with two monitors.

For further information, contact Panasonic Video Systems, One Panasonic Way, Secaucus, New Jersey 07094, or call (201) 348-7182.

### Miscellaneous

#### New Parsons T-450 Trencher Plow Combination

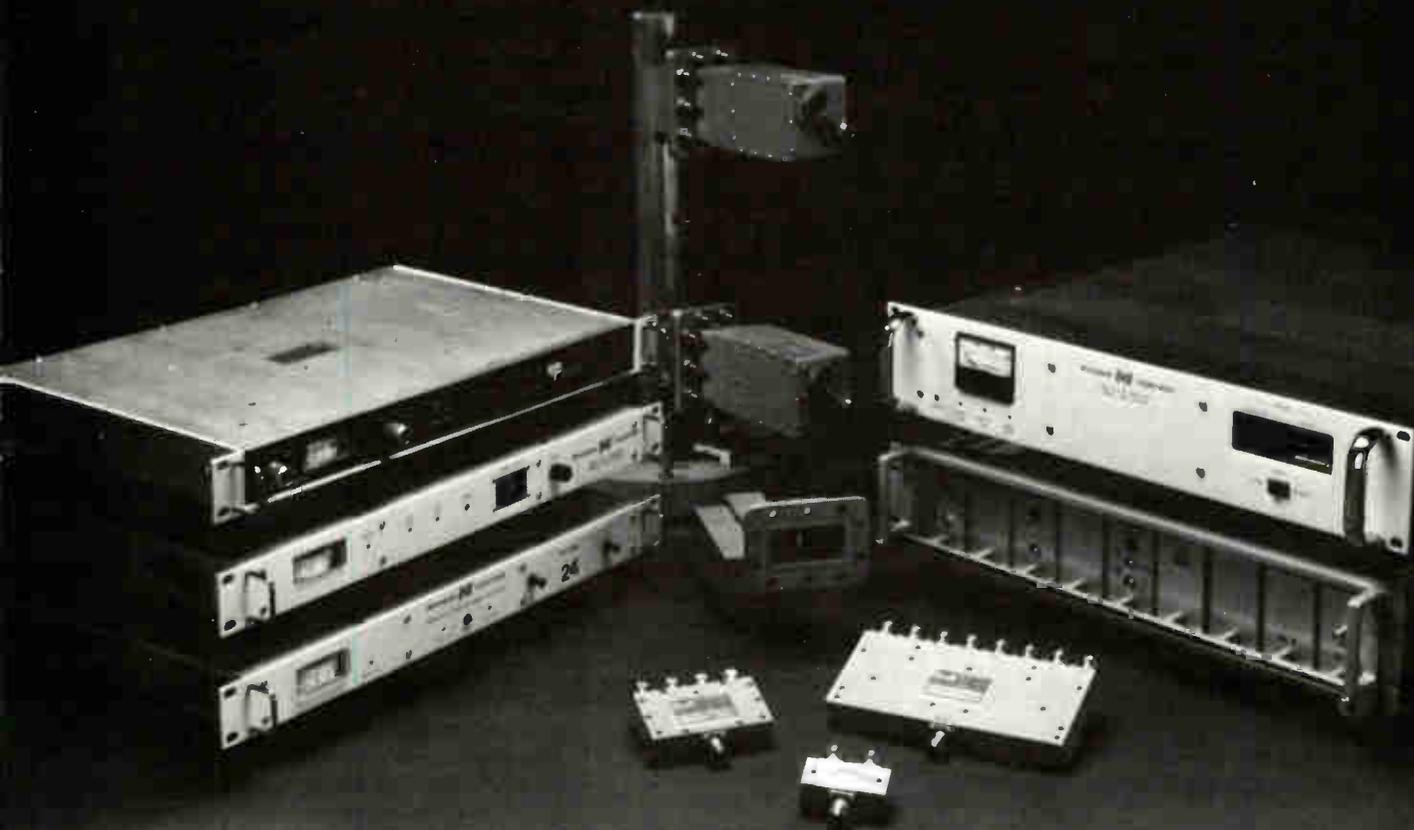
The new Parsons T-450 mix or match hydrostatic trencher/plow combo is now available from Seaman Company, a unit of Stowell Industries. The unit offers extremely fast interchangeability, and operates center-offset or plow-only. In addition, it has hydrostatic 4-wheel drive. A single speed transmission provides complete selection of working speeds up to 3 MPH and transport speed to 5 MPH. The digging chain has 4 forward speeds and 1 reverse speed. No foot-clutching is required with the T-450 to insure ease-of-operation. Few moving parts on the digging chain and minimal maintenance points insure trouble-free service.



Power options on the T-450 include a 40 HP liquid-cooled Waukesha diesel, a 50 HP liquid-cooled Waukesha gasoline engine or a 49 HP air-cooled Deutz diesel. The unit's hydraulic system provides power to plow up to 24 inches of cover. Trenching attachments will dig to widths from 6 to 18 inches and depths from 48 to 84 inches. Available tire options include standard 20 x 12 x 15 or flotation 31 x 15.5 x 15. The multi-purpose unit offers complete flexibility and faster interchangeability than any machine in its class.

For additional information on the new Parsons T-450 trencher/plow combo, contact: Seaman Company, P.O. Box 25331, Milwaukee, WI 53225. Telephone: 414/781-8900.

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# TVRO Station Installed in Point Barrow, Alaska

*A Staff Report*

**W**e're currently receiving about sixteen hours of sunlight per day. You see, we go from a condition of three months of total darkness to three months of continuous sunlight. So when it actually begins to shift from winter into spring, we get changes of 20 to 25 minutes of sunlight each day. When you're this far north it really makes a difference."

Tom Saxton was explaining a little about the living conditions in the northernmost town in the United States. Saxton is the manager of Barrow Cable Television, a wholly-owned subsidiary of the regional native corporation known as the Arctic Slope Regional Corporation.

According to Dave Fauske, the Executive Vice President of ASRC Communications, Ltd., cable TV was introduced in Barrow in 1969, operating for the next ten years on a tape-delay basis only. Then, in November of last year, live television via satellite came to Barrow, with the installation of a ten-meter earth station receiver, installed under the supervision and consultation of Microwave Associates. Fauske himself was the initial coordinator, and the representative of ASRC who supervised the entire project from start to finish.

Saxton, who also worked on the project, says that the actual construction of the station took a total of approximately a month and a half. "We had to construct a pad," he explained, "a dirt foundation area on an undeveloped portion of the tundra, out near the edge of town. Then, the earth station foundation itself consisted of three 12-inch diameter steel pilings, which were driven down into the ground about 16 feet and then slurried into place. There's a water and sand mixture that was poured down in there, and because the ground below about two or three feet remains frozen year around, this slurry froze right back. So, it provides a concrete-like base for the pilings to be held in place. Then on top of that, the pilings were capped off with steel plates, and a box-girder construction in a triangular shape was built to hold the pads and the base extension unit for the Andrews' dish. Once dish construction began, it did encompass a period of between two and three weeks, however."

One of the unusual aspects of the Point Barrow system is the integration of a demonstration project with regular satellite programming. The project is operated by Alascom, a common carrier, to provide television programming—news, via tape-delay, live sports, weather, as well as a potpourri of network programming—to extremely remote areas of the state. The signal is distributed by satellite and then broadcast throughout the individual villages by mini-transmitter. In Barrow, Saxton has installed a 12 GHz video link from the local Alascom earth station to the cable headend. The project signal is then transmitted free of charge on channel 11 for those people who are not hooked

up to cable.

Although the Alascom project is able to utilize 4.5 meter dishes, with respect to Satcom I, the smallest dish that can be used in Alaska—even as far south as Juneau and Ketchikan down on the southern panhandle—is a six meter dish. As for other special accommodations, Saxton says, "we also provided a special heated, arctic-insulated LNA enclosure on the back of the antenna. This allows a small working space, and also has some high wattage, high output heaters attached to it, in order to keep the whole LNA area dry and warm throughout the winter months."

When asked whether the plant becomes brittle or needs protection from the prolonged subzero temperatures, Saxton said no. "Surprisingly, there is no real need for that kind of thing. However, we do have the same sort of problems you would experience in just about any seaside community. With the severe temperature differential between summer and winter, and with the salty atmosphere in the summer, we have a lot of corrosion on the overhead plant. Cable connectors do tend to deteriorate rather rapidly. Aside from that, the major difficulty that we have is that every now and then someone will come along clearing the roads—our pedestals are placed fairly close to the roads—and they'll just blade one of our pedestals over. It was really bad news when they did it out on the run from the earth station on in, and knocked out seven of them."

Despite troubles such as this, overall system performance for the Barrow installation is, in a word, exceptional. As Carl Guastaferro, the M/A Com representative for the installation, said, "It was very gratifying for me to see the culmination of what was the better part of a year's effort on our part turn out as great as it did. I only hope the residents of Barrow appreciate the quality signal they are getting, because believe me they're a lot better off than viewers in small systems down here in the lower forty-eight. The systems down here, operating with five meter antennas, for the most part are just tottering within a hair's breadth of being unacceptable. The systems were designed for a certain signal level coming in from space, and that signal level quite frankly is about 2 dB lower than it should be. You'll have fun getting the people at RCA Americom to admit that, but in any event, it's a true statement. There have been enough measurements made by companies like Compucon to bear me out."

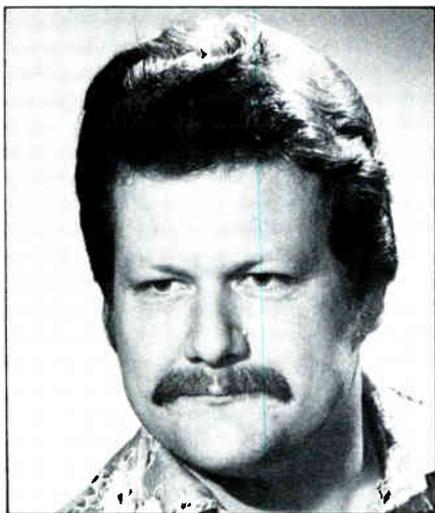
Guastaferro went on to note that, "There is at least a 7 dB difference in gain between a 4.5 meter and a 10 meter dish. The signals in Barrow are not 7 dB weaker than they are here; they're only about 5 dB weaker. So what I'm saying is, they've got a little bit more fade margin to play with up there in spite of the fact that they're looking really low in the sky and there's all this horrendous weather around. That's why the pictures will be better up there." C-ED.

★ **Anixter-Pruzan** has announced the appointment of **Bob Weir** as manager, telephone industry sales. He will be responsible for sales to major telephone companies. Previously, he was marketing manager of Anaconda's Communications Group and prior to that held various positions in sales, marketing and product management at Anaconda.

In addition, Anixter-Pruzan announced the appointment of **Bob Jackson**, vice president, national accounts for the telephone and communications industries. He transferred to Anixter-Pruzan from Anixter Communications Systems and brings to his new job many years of communications experience.

Finally, Anixter-Pruzan also announced the appointment of **Cal Edinger** who previously was sales manager in St. Louis, to manager of the St. Louis district, reporting to Matt Plonsky, vice president of the central region. Cal joined Anixter three years ago after previous experience in the Communications Division of Graybar Electric.

★ **Don Carroll**, president of **Oceanic Cablevision** in Honolulu, has announced the appointment of **Bruce Horton** to the position of purchasing agent and property manager. Horton's responsibilities will include all purchasing and converter repair operations for the 650-mile, 50,000-subscriber system.



*Bruce Horton*

Mr. Horton previously worked for Oceanic as installation foreman, and has worked as well for Island Cable

Contractors in Honolulu, and Napa Valley Cable, Inc., in California.

The appointment of Ms. **Irene Wong** to the position of program director was also announced by Oceanic. Wong will have full responsibility for all aspects of programming for the 30-channel, 50,000-subscriber system including operation of an extensive videotape origination and satellite delay center.



*Irene Wong*

For the past two years, Ms. Wong has been with Visions, Ltd., of Anchorage, Alaska, where she held the position of program director and took part in the development of highly innovative programming for Visions' MDS system.

★ **Compact Video Systems, Inc.**, sales division, has announced the promotion of **John Heller** as plant director, and reporting to him will be **Carter Engstrom**, recently named assistant plant director. The sales division is establishing an international market for systems concepts in addition to the manufacture of domestic broadcast, cable and industrial television systems now in progress. Systems concepts range from 40-foot mobile units manufactured for National Educational Television to the design of electronic switching systems for CBS-TV.

Oscar Wilson, president of Compact Video Systems, Inc., sales division, has also announced that **Jim Buehler** has joined the sales staff. Jim's sales experience has provided him with the technical knowledge required to sell specialized production systems to customers in the Los Angeles region. He will also be involved in the ENG

camera sales campaign.

★ **William R. Gooden**, Mooresville, North Carolina, has been promoted to **Valtec Corporation** controller, James R. Kanely, president of the communications, fiberoptic and electro-optic company announced.

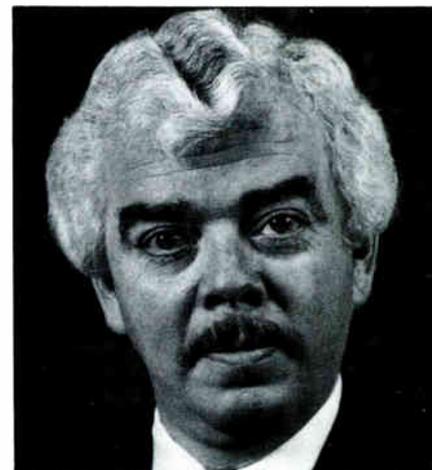
Gooden has been controller of Valtec's Catawba, North Carolina, Comm/Scope subsidiary since 1978. A CPA, Gooden earned both his bachelor's and master's degrees in Business Administration at Wake Forest University. He also has a bachelor's degree in accounting from the University of North Carolina.

Before joining Comm/Scope, he was general accounting manager of the textile machinery group of Crompton & Knowles; controller and treasurer of the Hobart Smith Companies; and a public accountant with a Charlotte, North Carolina, CPA firm.

Gooden is a native of Hiddenite, North Carolina.

★ **Robert E. (Bob) Price**, former division manager for American Television and Communications Corporation, and vice president for Hospital Products, Inc., has been named director of marketing for **United Video, Inc.**, it was announced by company executive vice president, Roy Bliss.

Price, 42, fills the position that has been vacant since November, 1979, and began working for United Video April 21, to direct the company's overall marketing plans for its satellite and microwave activities.



*Bob Price*

He joins United after serving as vice president for Hospital Products, Inc.,



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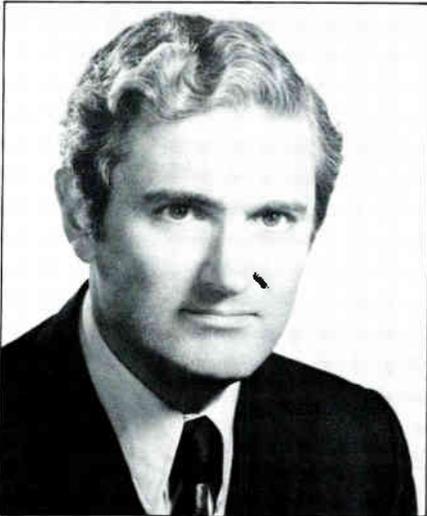
**LOW—COST**

of Houston, for almost three years. Prior to that he was division operations manager at ATC after joining the company in 1973, where he gained his initial cable television experience. Price is a 1959 graduate of Ohio Wesleyan University with a bachelors degree in accounting, and received his masters degree in business administration from the University of Denver in 1975.

He will also participate as a member of United's executive management team according to Bliss. "We've searched very thoroughly for a person with Bob's cable experience and management talents because of our rapid growth during the past two years," Bliss explained. "He is highly respected throughout the cable industry, and will give us more depth and experience to continue being a definitive force in the industry."

★ **Henry Pessah** has been appointed manager of engineering for **Cablewave Systems, Inc.** In this position, he will be responsible for product design and the technical direction of Cablewave.

Formerly the product manager for all products in addition to advertising and technical publications manager, Pessah has also served in various sales and engineering positions. He came to Cablewave Systems nine years ago from Amphenol Division of Bunker Ramo Corporation.



Henry Pessah

★ The appointment of **Charles I. Ogden** as director, national sales has been announced by **Leader Instruments Corporation**.

William L. Brydia, corporate vice president and general manager, indicated that Mr. Ogden, in this newly created position, will be responsible

for managing Leader's continuing growth in existing markets and for spearheading the penetration of new markets for the company's electronic instruments.

Ogden brings to this position over 20 years of sales and management experience in the electronic and computer industries. Most recently he was the branch marketing manager for Honeywell Information Systems where he was responsible for all OEM mini-computer sales in New York, New Jersey and Connecticut. Prior to this, he was director, large account marketing at Singer Business Machines and held various marketing management positions during 12 years at International Business Machines Corporation.

Ogden, a graduate of Pace College, now resides in Wayne, New Jersey, with his wife, Laraine.



Charles I. Ogden

★ Emory Cohen, general manager of **Compact Video Systems, Inc.**, has announced the promotion of **Steve Schifrin** from post-production operations to manager of sales and marketing for Compact's service division.

In his new capacity, Steve will be guiding marketing efforts in the production and post-production areas as well as assuming responsibility for customer service and sales activities. His sales staff will also be involved in Compact Video's new thrust into post-production sound recording as well as ImageVision, Compact Video Systems' and Image Transforms' proprietary high resolution video tape system.

★ **Times Wire & Cable**, Division of Times Fiber Communications Corporation, has announced the appointment of two national account managers to handle the increasing amount of business with multiple service CATV operators (MSOs).

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7 Channel Block Converters



- Adds 7 mid-band channels
- inexpensive system expansion
- competitively priced

BC-1100 Available in June  
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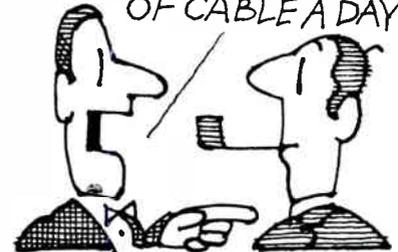
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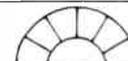
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**California!**

Sonic Cable TV, an expanding independent cable TV company located on the beautiful central California coast, has the following opportunities:

- Qualified Engineer to assume full responsibilities for over 600 miles of plant, plus headend and associated equipment. The successful applicant will have hands-on experience within the cable industry including microwave and earth satellite systems installation and service and new plant construction and rebuilds.

- Design Engineer with a minimum of two years recent experience in design of two-way systems plus rebuilds.

Company offers excellent fringe benefits and salary. Interested applicants should send resumes in confidence to:

General Manager  
Sonic Cable TV  
P.O. Box 1205  
San Luis Obispo, CA 93406  
Sonic Cable TV is an Equal Opportunity Employer

To place your classified ad, contact Patty Kay at (303) 573-1433; or write to Titsch Publishing, Inc., P.O. Box 5400 T.A., Denver, CO 80217. Rates are \$40 per column inch, add \$2 for blind box number. Deadline is three weeks prior to cover date.

## Quality Control Technicians

UA—Columbia has immediate openings for Quality Control Technicians in the San Antonio, Texas system. These unique positions monitor and test all technical performance of the San Antonio system; a progressive 35-channel fully two-way system employing dual TVROS, 9-hub AML and eventual 3,200 miles of distribution plant. Quality Control Technicians operate independently from the system technical personnel and management - reporting all results directly to UA-Columbia headquarters. Accordingly, applicants must have strong technical skills in CATV testing and maintenance and due to minimal direct supervision, must be self-starters and highly responsible. Salary commensurate with experience and background. Send resume or contact: Bob Luff, V.P. Engineering, UA-Columbia Cablevision, 26 W. Concho, San Angelo, TX 76903, (915) 655-0634.

## CHIEF TECHNICIAN

### —A "Super-Pro"

I'm searching for an experienced chief who can handle all phases of operation of a state-of-the-art, 35-channel two-way system located in metropolitan Washington, D.C. Headend, TVRO, and FML experience mandatory. FCC license desirable. Supervisory experience a must.

An exciting challenge awaits you. Ample room for advancement with an aggressive company. Contact:

Bill Howard  
Chief Engineer  
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Arlington Telecommunications Co.  
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## Help Wanted

Help wanted: CATV construction personnel needed immediately. Openings in all phases of construction. Top wages. Send resume in confidence to or call:

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## EXPERIENCED CATV PERSONNEL

Mountain States Video, Inc., a joint venture of United Cable Television and Daniels & Associates, is in the process of building an 1800+ mile system in the Denver Metro area. We are now seeking qualified personnel for the following positions.

- Construction Supervisors
- Chief Technicians
- Bench Technicians
- Trunk Technicians

For further information and interview consideration, please contact Roy Glenger, Project Manager, at 5200 S. Quebec, Suite 303, Englewood, Colorado 80111, or telephone (303) 771-5895.

## HELP WANTED

### CABLECASTING MANAGERS

**CABLECASTING MANAGER.** To manage 35 member staff of News Team, Production, Commercial Sales, and Local Origination facility for award-winning Cable TV system on tropical island of Guam. Ideal advancement opportunity for an experienced Cablecasting or TV manager with strong administrative skills ready to move up into a first rate 18,800 subscriber Cable TV operation. Salary open. Send resume to Lee Holmes, President, Guam Cable TV, 530 W. O'Brien Drive, Agana, Guam, 96910. (671) 477-7304.

## CHIEF TECHNICIAN

Comcast Corporation is seeking a qualified individual for its newest cable television system in a major New Jersey market.

This individual will play a role in the planning, construction and staffing of this new 300-mile system, with probable expansion into neighboring communities. It's an excellent growth opportunity for the right individual.

If you have construction and operations experience in the cable television industry and would like to join one of the industry's fastest growing MSOs, contact:

Mike Singpiel  
System General Manager  
Comcast Corporation  
1 Belmont Avenue  
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Comcast Corporation is an Equal Opportunity Employer.

## WANTED

Manager/Vice-President of Operations for 50,000 subscriber MSO to handle: purchases, budgets, system evaluations, public relations with franchise committees. Will work at corporate headquarters. Must be willing to relocate. Salary open. Send resume to Box C-ED 05-80-1.

## Chief Engineer

UA-Columbia Cablevision is seeking a Chief Engineer with strong management skills for its San Antonio system. The system is a progressive 35-channel/fully two-way dual trunk-single feeder, employing dual TVROs, 9-hub AML and eventual 3,200 miles of distribution plant. This is an excellent opportunity for an experienced Chief Engineer desiring to move into a challenging engineering/management position with a major MSO. Salary commensurate with experience and background. We are an Equal Opportunity Employer. Please send resume or contact Bob Luff, V.P. Engineering, UA-Columbia Cablevision, 26 W. Concho, San Angelo, TX 76903, (915) 655-0634.

## Immediate Openings Available

for Bench Technicians experienced in repairing all types of electronic equipment used in the cable television industry. Contact:

Cablevision Equipment Company  
3838 Cavalier  
Garland, Texas 75042  
(214) 272-8551

## Director of Engineering

Recent promotions have created vacancy in midwest region of rapidly growing MSO. Require experience in system maintenance, headend and satellite equipment. Current plant covers 250 miles with additional 180 miles of new construction. Salary commensurate with experience. Call (313) 481-0510 and ask for Mr. R.E. Duncan, or send resume in confidence to:

216 E. Michigan  
Ypsilanti, Michigan 48197  
Attn: R.E. Duncan

## HELP WANTED CABLE TV NEWS DIRECTOR

NEWS DIRECTOR, tropical island Cable TV ENG with daily satellite news feed. Salary open. Some anchoring. Send tape and resume to Lee Holmes, Guam Cable TV, 530 W. O'Brien Drive, Agana, Guam, 96910.

### WANTED

Apartment construction foremen. Immediate employment. Three hundred miles of plant operational, three hundred additional miles under construction. Four separate franchises. First class system. Top wages and company fringe benefits. Contact:

Mr. Richard Clester, President  
2223 Strawberry, C-35  
Pasadena, Texas 77502  
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### CHIEF TECHNICIAN

Young, independent MSO company in Texas is looking for a qualified hands-on, head-end and systems man to supervise construction, system turn-on and maintenance. Applicant must be a self-starter and work with minimum supervision. EXCELLENT GROUND FLOOR GROWTH OPPORTUNITY for the applicant who can fill the above requirements. Reply in confidence to box C-ED-0580-2.

### WANTED

Lead technician and technicians. Three hundred miles of plant operational, three hundred additional miles under construction. Four separate franchises. First class system. Top wages and company benefits: Contact:

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The cable television industry's top technical publication is seeking qualified engineer/writer/reporter for newly created Technical Editor position. FCC license preferred.

Must be willing to relocate to Denver or Washington, D.C.

Excellent salary, benefits. Exciting growth opportunity. Reply in confidence to Box C-ED-0580-3.

### WANTED

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Ken Kendall  
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Hill City, KS 67642  
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  - Installers
  - Linemen
  - Line Foremen
- Contact Seminole Communications, Inc., 3572-A Gladiolus Rd., Ft. Myers, FL 33908, (813) 481-2812.

### Business Directory

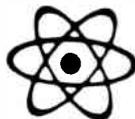
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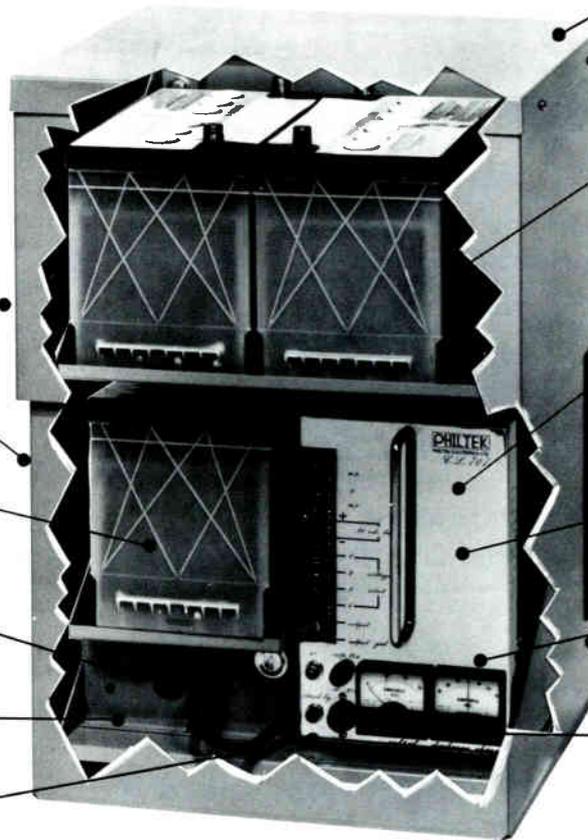
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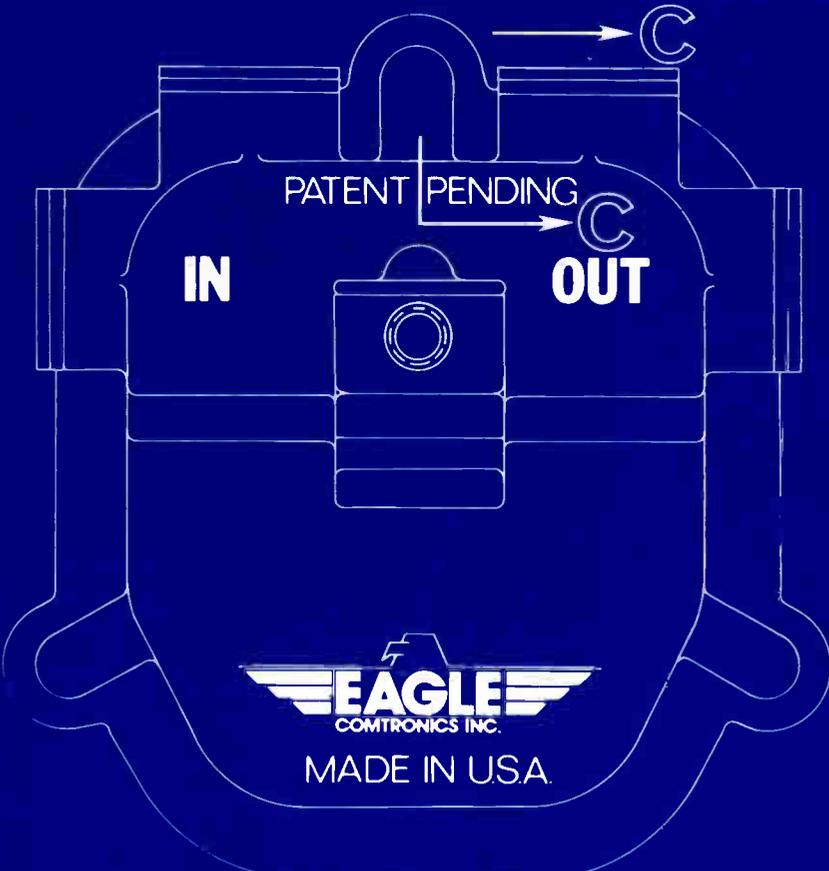
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COLOR CODE	orange	gold	white	black	green	purple	yellow	red	silver	blue
TAP LOSS										
INSERTION LOSS										
5 MHz		2.2	1.2	.5	.4	.3	.2	.2	.2	.2
300 MHz		2.7	1.4	.7	.5	.4	.3	.3	.3	.3
400 MHz		3.1	1.6	.8	.6	.5	.3	.3	.3	.3
450 MHz		3.2	1.7	.9	.7	.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 5-400MHz 20DB Min										

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