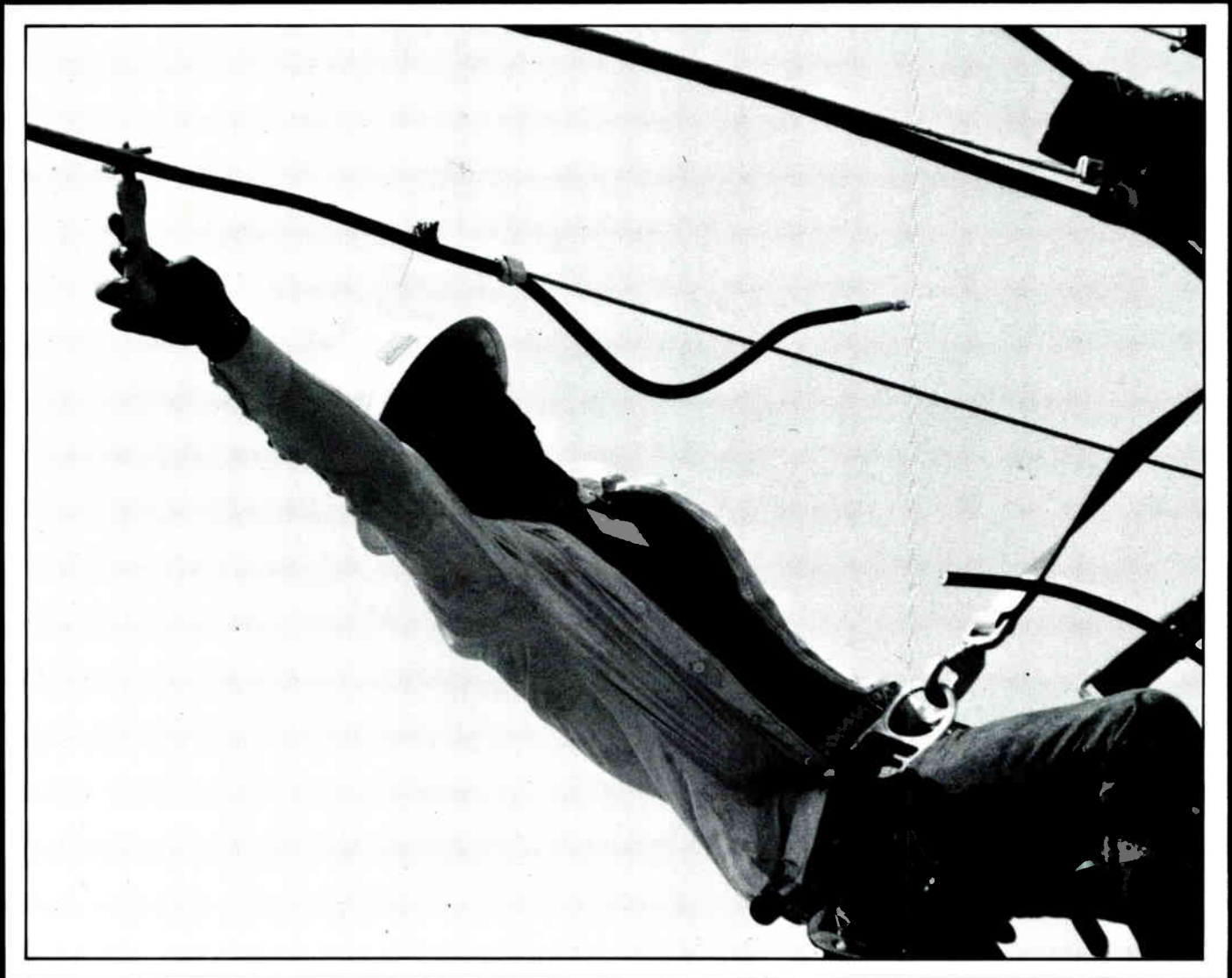


# communications/engineering digest

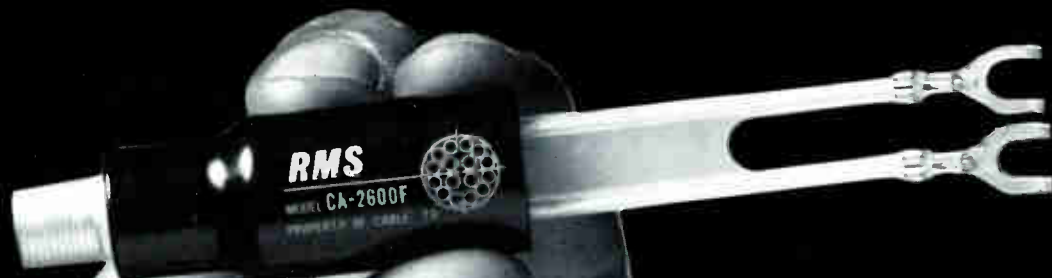
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special issue  
cable television manpower



october, 1976  
volume 2, no. 10

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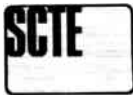
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**COVER:** A student of the Garfield Skills Training Center gets on the job experience.

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## opinion/editorial

Judith Baer, Associate Publisher

Cliff Schrock and I have an agreement. He writes in engineering and I try to write in English. This volume of *C/Ed*, with its theme of manpower training and development, is in English.

We've covered a number of issues in this edition. The Miami-Dayton Manpower Training Center, commercial training programs, educational programs offered by colleges and universities, supplier programs and trade and engineering membership seminars and sessions are covered. We've interviewed Jim Palmer of C-COR, a longtime member of the cablevision industry and a promoter of professionalism in industry engineering. It took a bit, but we also came up with an interview with Judith Scharf of TCI, one of the few women engineers in the industry.

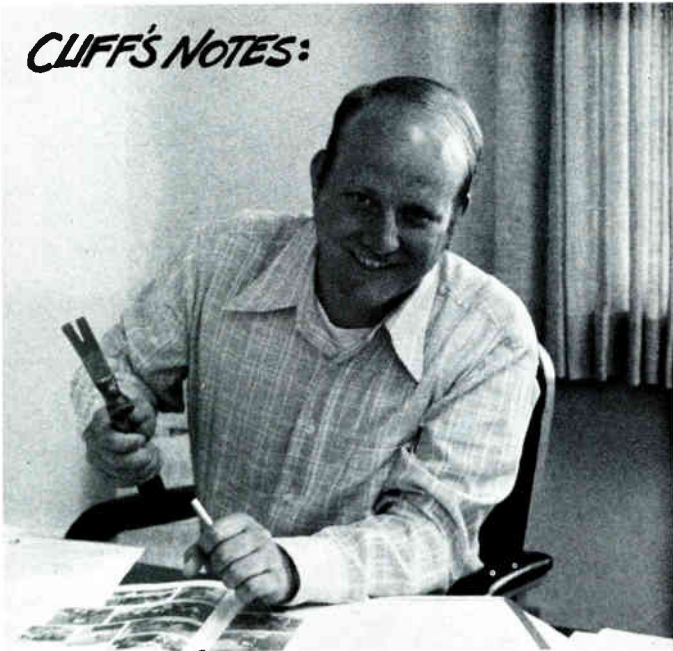
We've tried to offer a balanced picture of the various training possibilities open to individuals and to companies. In some cases, a person will, under his own steam, make the effort required to grow. In other cases, company management must literally take its employees by the hand and send them to school. Not everyone is geared to set his own goals and milestones, and it truly is the responsibility of any commerce or trade that has the daring to call itself an industry to assist in setting the standards for personal growth. These standards, milestones, or whatever you might call them, come in the form of industry-wide hiring, training and promotional practices. Just as electronic and electrical hardware must be compatible to be used by the largest number of consumers, so should personnel practices be standard across an industry. Wages should be fairly consistent and within a few dollars of each other from region-to-region and company-to-company.

I personally am against unions and guilds. I do not believe that licensing is the answer either. I do not believe that it will lend anything to the growth of this industry. I do believe that we need to set guidelines and goals for growth for our industry personnel.

There is a way to start to handle this problem before someone else comes in and handles it for us. I hate committees, but perhaps such a group should be formed to develop some guidelines in personnel development. Membership on this panel could include people from associated technologies, professional personnel managers, owners, operators, engineers, training and technical people representative of the cable television industry. No absolute monetary amounts should be produced from such a report, but at least some scales could be developed which would assist management in the decisionmaking processes. Guidelines for personal development can be formulated. Guidelines on handling personnel problems and how to develop or tailor existing personnel practices and procedures would be of benefit to operators, large and small. That most important "line of communication" would open up between groups which do not always understand one another. The industry would be doing its job.

A handwritten signature in cursive script that reads "Judith Baer".

## CLIFF'S NOTES:



### We Need Your Help

Dear students, techs, engineers, installers and friends . . . This is a large industry—spread out over five continents (believe it or not) and a handful of people sitting in Denver, Portland and Washington, D.C. can't even begin to cover everything that happens. In my August editorial, I said that this was your magazine. Now I'm asking for your opinions, thoughts, news and anything else of interest.

Please don't feel any hesitation. A few years ago, when I was out working as a technician in a cable system, I always put off talking to a magazine about my ideas. I can tell you right now, it was a big mistake. And everyone has something to contribute.

There are still many unanswered questions in cable concerning such things as cross modulation, radiation tests, optimum design and spacing, signal to noise degradation, standby power and many more.

And the answers don't come from a lab. They come from you, using and running systems on a day-to-day basis.

If you can write, jot down your ideas and articles on paper. If you can't seem to find time to write (believe me, I know the feeling), call me up and I'll do the writing.

In the next couple of months, we're going to do special issues on converters, smart tap technology, visual testing, and non-linear distortion. We have already started some new features in *C/Ed* including "News At A Glance" and specialty issues like our September book on system sweep testing. I would like to start a regular monthly section on cable system designs and innovations and include some of the older innovations such as G-line, five mile T-7 systems using no amplifiers, isotropic scatter antennas and more.

I need your help for all of these. Please write. Please call. Get involved. Give to your local engineering magazine. It's your magazine.

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Recent advances in cable technology are sort of mind-blowing. Average sized systems are talking about the cost effectiveness of earth only receive stations. Fiber optics has advanced so rapidly that cable may be using this technique for transportation runs within the next few years. Subscriber terminal development is poised for the development of marketable software. We have intelligent taps, alphanumeric microprocessor systems, status monitoring, LDS transportation capability, improved coaxial cable, etc.

However, every now and then it is refreshing to pause and reflect on whence we came. I recently visited a system in the Northeast that I had a prior affiliation with in the early 50's. It brought back memories on how things used to be.

Do you remember when:

- The headend building was a tarpaper shack on a remote mountain top?
- The SLM (called field strength meter) was a modified TV set with a video level indicator?
- When distribution cable was strung house-to-house, with certain homes supplying power for free monthly services?
- When you had to *beat* the cable to bring the attenuation characteristics back to normal?

- When service trucks carried cartons of 6AK5's and 6BQ7's?
- When certain signals were transported illegally at VHF?
- When the first pressure tap was connected to a telephone cable?
- When there were no pressure taps?
- When five channels was a "broadband system"?
- When G-line was the latest thing in low loss transmission?
- When the headend processor was a single channel strip amp?
- When cable was purchased by the foot and not by specifications?

If these are memories for you, you've been in the business for most of its existence (25 years) and you can properly marvel at the innovations in technology that presently surround us. It is my hope that someone will someday write a column similar to this, reminiscing about the "old days" when computerized alphanumeric channels and fiber optic transmission were in their infancy.

Perhaps by then, we will have copyright legislation, pay-cable parity, two-way systems, a cable receiver, full in-system measurement capability, 40 million subscribers, and *utilized* public access channels. Perhaps even a new SCTE president!

The purpose of this discussion is to precipitate suggestions and comments on the formation of a CATV Historical Society that can cast our past in stone (or aluminum) and establish an appropriate museum of artifacts and events.

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**Canadian Cable Television And the CRTPB**

In the United States you have the FCC. In Canada we have the Canadian Radio-Television and Telecommunications Commission and the Department of Communications, which together, serve a similar function. However, we also have a further organization which has a significant impact on the technical regulation of cable television in Canada and which is essentially unique. This organization is the Canadian Radio Technical Planning Board (CRTPB).

The CRTPB is a nonprofit, nonpolitical organization with twenty-six sponsor member organizations representing interests of users, manufacturers and consulting engineers concerned with the radio frequency spectrum.

The purpose of the Board is to advise the Canadian Federal Government on management of the electromagnetic spectrum. The main work of the Board is focused on technical considerations,

although social and economic policy matters are often discussed and included in recommendations.

Currently, the CRTPB has eight subcommittees addressing specific areas of active dialogue. Any member of CRTPB may be represented on all, or any, of the committees. A draft specification from the Federal Department of Communications (DOC) is usually forwarded to the CRTPB head office, and then sent along to the chairman of the appropriate subcommittee with a request for the subcommittee to review the draft document and set up a work schedule with a specific date to respond to the DOC on the items under discussion.

The subcommittee may schedule three or four meetings on a profound topic over a six-month period, in order to give all members adequate time to research the question and interact with each other in the genuine search for the right answers. It is this interaction within the communications industry that is very useful, for it tends to sort out a lot of problems and bring about a resolution of different views from varying interests before the government is advised on the general feeling of the industry at large. It is seldom possible to obtain a complete consensus within the work of the subcommittee, and both the majority and minority opinions are identified in the final report to the DOC.

The DOC has accepted about 80% of

the recommendations from the CRTPB over its thirty-one year history. Sponsor members are in no way precluded from direct contact with the DOC, but there is an earnest effort to work things out within the CRTPB.

The CRTPB operates on a very modest budget of about twenty thousand dollars a year, of which ten thousand is put up by the DOC. The member organizations pay nominal dues, but do provide the time of experts for the committee work and, of course, pay all travel expenses.

The CRTPB is effective in providing a forum within which various elements of the communications industry can act and interact with each other, and with the Federal Government, on important subjects.

The Canadian Cable Television Association (CCTA) is, of course, a member of CRTPB, having a profound interest in the radio spectrum. The Association operates through its Technical Committee, with delegates from this Committee on all CRTPB subcommittees that effect the cable television industry.

While in no way negating direct contact with the Canadian government, the CRTPB serves a very major function for our industry in rationalizing positions on a multitude of government legislation, and provides a forum for informed opinion and consensus which usually has a major impact on government thinking. □




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# Technical News at a Glance

... CBS has asked the FCC to adopt a uniform standard for quadraphonic FM broadcasting. It claims today's proliferation of techniques does little more than confuse the public and feels the FCC should consider a system that is compatible with present stereo (like CBS's SQ system).

... The Counsel for UHF Broadcasting wants equal treatment in UHF built-in antennas for TV sets. It claims the present loops supplied are often discarded.

... NAB has filed in opposition to the CATA smaller than nine-meter dish proposal on the grounds that it would jeopardize the most efficient usage of the 4 to 6 GHz band.

... The Don Burton owned Star Stations had their licenses revoked permanently in what is termed the most severe punishment ever dealt by the FCC. The FCC pulled the licenses for repeated violations and misrepresentations in political broadcasts. Stations were located in Portland, Indianapolis and Omaha.

... The FCC begins rulemaking on EEO guidelines for cable systems and it is expected that the rules will track closely the recent guidelines for broadcasters.

... NAB has asked for permission to rebroadcast CB radio transmissions to enhance the public service potential of stations.

... Comments to the FCC were split concerning licensing of technicians in broadcasting. The present system does not differentiate between operating and technical grade.

... A warehouse burned in Oakland California, on September 10 destroying \$2.5 million of cable TV equipment belonging to Teleprompter's Focus Cable of Oakland.

... The NCTA has issued its call for papers for the 26th Annual National Cable Television Association Convention & Exposition. Selection of topics includes: Small Earth Stations, Small Systems' Problems, Testing and Maintenance, Protection of Service and Privacy, Pay Cable, Special Displays and Original Cable Programming, Advanced Techniques, Human Reactions to TV Picture Impairment, and Significant Foreign Cable Developments. Abstracts must be submitted no later than November 1, 1976.

... October 12-14 are dates for Invitational Conference on Cable Technology at University of Wisconsin, Kenosha, Wisconsin.

## wrap up

Jerry F. Caddy, owner of Arkadelphia Cable, Arkadelphia, AK, has contracted with C-COR for equipment and engineering services for a new 3,100 home extension of system.

Thomas J. Zimmerman has been named vp of operations at Channel 100. Zimmerman was a founder of Daconics Corp. which was recently acquired by Xerox. David S. Lenzner joins Jerrold as director of human resources. Position includes management of personnel and industrial relations. Lenzner reports directly to Robert D. Eisenhardt, Jr., president of Jerrold. Raymond F. Haskin has been appointed vice-president and director administration for ITT Cannon Electric, North America. Haskin comes from The O. M. Scott & Sons Co.; replaces Carl W. Peacock. Peacock has been named vice-president administration for ITT Rayonier Inc. in NYC. Magnavox CATV Division has new material control manager in Robert Francis. Richard L. Behr has been appointed manager of systems design and field engineering. Behr has been in the cable television industry for past 20 years. Before this appointment, he was contract administrator on Magnavox turnkey projects. Varian, a developer and producer of microwave components, has appointed Tom Mochalski as general manager of its Solid State Division in Palo Alto, CA.

Nicholas E. Worth, director of engineering for

TeleCable Corp., Norfolk, VA, has been elected vice-president of engineering by the company's board of directors. Worth joined TeleCable in 1973. Prior to that, he was a senior communications engineer with the Jansky & Bailey Division of Atlantic Research.

Anaconda has completed acquisition of Control Networks Corp. from the Continental Telephone Company. CNC manufactures and markets electronic PABX equipment to the telephone industry. Satori Productions, NYC and Titsch Publishing Inc., Denver, CO, have joined in co-venture to produce "Cable-Vision's Washington Report." Brian Lamb, national affairs editor for CableVision magazine and vice-president of Media Research will provide talk format interviews from the nation's capitol to be shown on Daytime/Nighttime. Bache Halsey Stuart has assisted Microband Corp. of America in placement of equipment financing with the Chemical Bank of NY. Loan will be used to complete construction of MDS stations previously authorized by the FCC. Suburban Cable, East Orange, NJ, is going for franchises in Hillside, Roselle, Roselle Park, Springfield and Union, NJ. S. J. DeLuca has been appointed finance manager of Magnavox CATV Division in Manlius, NY.

GTE Sylvania reports business booming. Pay program installations are continuing across the country with many packages available for smaller operators. NCTA hosted Independent Operators meeting in Washington, D.C. Sept. 19. Engineering programs for national convention are being coordinated with Robert V. C. Dickinson, E-Com, as chairman of Technical Program Committee. Programs for Western Convention, December 1-4 in Anaheim are planned. NCTA Associates Committee met in Washington during late August. They'll meet again in late November at Anaheim convention meeting.

Chuck Siperko, formerly with Microdyne, joins Western Union as project engineer on CPB/PBS satellite program. Ed Felton has been promoted to Western zone manager for Charles Machine Works, Inc., manufacturer of Ditch Witch underground construction equipment. The fall convention meeting for the Virginia Cable Television Association will be held Oct. 27-28 at Sheraton Inn, Hampton, VA. T. V. (Ted) Anderson has joined Systa-Matics in Tulsa, OK as Western regional marketing manager. Bruce D. Buck has been appointed vice-president of International Sales at CCA Electronics in Gloucester, NJ.

In Canada, Rogers Telecommunications Ltd. of Toronto took control of Premier Cablevision of Vancouver under an arrangement announced by officials of both companies. October marks the first issue of the IEEE Transactions on Cable Television. IEEE has a membership of over 175,000 worldwide. Texscan and Theta-Com closed their negotiations on September 3. Texscan is negotiating with a manufacturer of headend equipment (Phasecom Corp.) to distribute hardware. Jerrold is deciding to distribute some equipment through Anixter-Pruzan and maintain a limited line for themselves. □

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## news

**CLARIFICATION:** The August issue of *C/Ed* included an article titled "Design Criteria of a PBS Earth Station." The title was chosen by the editors of *C/Ed*. PBS considered a number of earth stations during its recent development of the Corporation for Public Broadcasting/Public Broadcast Service satellite network project. The earth station described in the August issue, is not truly a "PBS earth station." *C/Ed* does not wish to confuse or mislead its readers, and wishes to clarify the title by noting that a number of earth station designs were presented for the system. As of this date, Collins Commercial Telecommunications Division of Rockwell International Corporation, appears to be the ultimate supplier to CPB/PBS. That configuration will use a reflector with a ten-meter diameter rather than the eleven-meter diameter earth station described.

### SCTA Show Well Attended

Over 500 cable industry personnel convened in Atlanta, Georgia, for the 16th Annual Southern Cable Television Association meeting at the Fairmont Colony Square Hotel. The meeting started on Sunday, September 12 with the opening of the exhibit areas. More than 80 industry suppliers displayed their wares on table top exhibits. A standup buffet was served in the early evening with entertainment.

Technical programming started on Monday to a full house attendance. Four sessions ranging from methods and measurements to satellite receivers were heavily attended throughout the day. Two sessions were staged on Tuesday morning covering reliability and FCC standards.

Otto Miller, executive secretary of the Southern Association, was the recipient of the Morris Dunn Memorial Award presented by Bill Hemminger, a pioneer in the industry. Hemminger presented the award from the Tower Club in behalf of Jim Collins, president,

during Monday's luncheon.

Pay cable remained a topic of interest with the Monday afternoon session packing the house and requiring additional seating. Congressman Lionel Van Deerlin attended the pay cable sessions and listened with interest. Van Deerlin, chairman of the House Subcommittee on Communications, arrived in Atlanta on Sunday and showed up at the Monday luncheon and other sessions during the day. He was guest speaker at the SCTA banquet on Monday evening.

Andrew Corporation, Antennas for Communications, AIL and Microdyne provided satellite feeds for various displays. Small aperture antennas were used for the reception of all satellite transmissions during the convention.

### Broadcast Engineers Third NY Meeting

The Society of Broadcast Engineers will host their Third Annual New York Meeting on Nov. 7-8, 1976, at the Holiday Inn in Hempstead, Long Island, NY. Two days of exhibits and meetings are planned with participation of SCTE. Cable industry personnel presenting papers include H. J. Schlafly, TransCommunications; I. S. Switzer, Switzer Engineering; and, James Dahlke, MetroData. FCC Commissioner Robert E. Lee

will be the banquet speaker.

Registration information is available from Mark Shubin, Lincoln Center for the Performing Arts, P.O. Box 607, Radio City Station, New York, NY 10019. Shubin can be reached by telephone at (212) 765-5100. Members of AES, AFCEE, IEEE, SBE, SCTE, SID and SMPTE may register for \$2.00 for the complete two-day program. Others may attend for \$5.00.

### University of Wisconsin Program

Telecommunications for Business and Industry is the title of an invitational conference on cable technology designed for corporate executives and scheduled for October 12-14 in Kenosha, WI. Sponsored by the University of Wisconsin-Extension Communications Program, the meeting features 35 participants in panels on such topics as Telepurchasing/Marketing/Point of Sale; Security/Environmental Control Systems; The Technology TimeTable; Advertising/Test Marketing and Consumer Research; Bank and Credit Transactions/Data Communications; Information Transfer and Retrieval/Microforms/Facsimile; Communications Satellites/Word Processing and Special Uses. Vance Hartke, Senator and member of the Committee on Commerce will address the dinner

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meeting on Wednesday, October 13 and Thomas Houser, director of the White House Office of Telecommunications Policy, will address Thursday's luncheon.

Program registration cost is \$225 and includes all costs except lodging and breakfasts throughout the conference. Details are available from Kim Baugrud, University Extension, UW-Parkside, Tallent Hall, Kenosha, WI 53140, telephone (414) 553-2312.

## NCTA Plans Tech Sessions

NCTA's Convention-Technical Program Subcommittee met in Washington during August to begin planning for sessions to be staged April 17-20, 1977 in Chicago during the 26th Annual NCTA meeting. Robert V. C. Dickinson, E-Com, chaired the meeting. Participants on the Committee include Robert Bilodeau, president of SCTE and with Suburban Cable; Joseph Stern, Stern Telecommunications; Ron Simon, Teleprompter; D. O. Cummings, C-COR; and O. D. Page, Consulting Engineer. Delmer Ports and Hazel Dyson of

NCTA's Engineering Department, provided staff liaison.

It is proposed to continue staging a joint SCTE/NCTA "Kick-off" session on the first day of programming, since the 1976 event went over so well and received very favorable comment. "Value Engineering and Zero Defects" was the subject of the 1976 meeting and featured the dynamic speaker, Bob Vincent of ITT. A similar speaker from outside the cablevision industry will be invited for the 1977 meeting.

To more technical and formal matters, NCTA has issued its Call For Papers for the Convention. Topics are outlined in the formal announcement and abstracts are invited from engineers and technicians. Various topics are new, including "Smaller System Engineering—Is It Different?" As in past years, SCTE will host Eyeopener Sessions. Sunrise and mid-morning programs are scheduled. The Engineers' reception plans are being made and nominations are being sought for the two NCTA Engineering Achievement Awards, one for

operations and one for development. The 26th Annual NCTA Convention Technical sessions promise to provide an experience for those who attend.

## New Converter Repair Company Formed

Ron Katz, former chief engineer with Plainfield Cablevision and George Fenwick, former chief engineer with Morris Cablevision and Dover Telecommunications, have formed KATEK Inc., specializing in CATV converter repair. George Fenwick says, "Initially, we began by repairing only Hamlin converters, but now are working on Jerrold's as well. We guarantee 30-day turnaround and feel our prices are very competitive."

Katz and Fenwick entered the field "because our experience as system operators showed us the large problem of keeping the 'boxes' working." "I don't think too many operators look into the future when they commit their system to using converters," Fenwick told *C/Ed*. "They don't realize that with

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thousands of converters in homes, a good percentage are going to fail, whether from customer abuse, or just plain failure. Consequently, they don't budget or plan for sufficient maintenance of the converters," Fenwick continued. KATEK is trying to ease them through the shock of converter repair.

The company is located in New Brunswick, NJ, and can be contacted by telephoning (201) 247-5385. 5385.

### Comm/Scope Purchased by Hutton-Drendel Associates

Comm/Scope, formerly the coaxial cable manufacturing division of Superior Continental Corporation, has been purchased by Hutton-Drendel Associates, Inc. of Hickory, N.C., and is now operating as an independent company.

The final agreement was signed in August by Frank M. Drendel, president of the new organization, and Clyde V. Hussey, president of Superior Continental, acting on behalf of the parent company, Continental Telephone Corpora-

tion. The purchase price was approximately \$5 million.

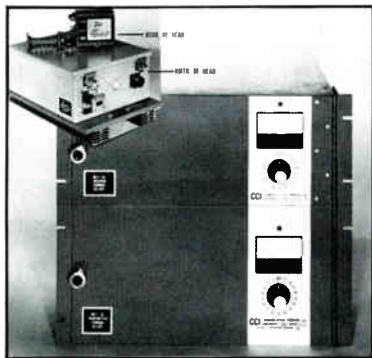
Drendel said Comm/Scope is fortunate in retaining all key personnel as well as most employees. Production, delivery and customer service will continue without interruption, and a new product development laboratory is under construction at the company's 44-acre plant site at Sherrills Ford, N.C.

Company offices, customer services, production and engineering will all be located at the

Sherrills Ford complex. Jim Webb, long associated with the company, will be vice-president in charge of sales and marketing, and Fred Wilkenloh, director of the Comm/Scope research program, is vice-president in charge of engineering.

Hutton-Drendel Associates, the new owner, was established by a group of Hickory-area business and civic leaders. George N. Hutton, president of Hutton-Bourbonnais Company, is chairman of the board. □

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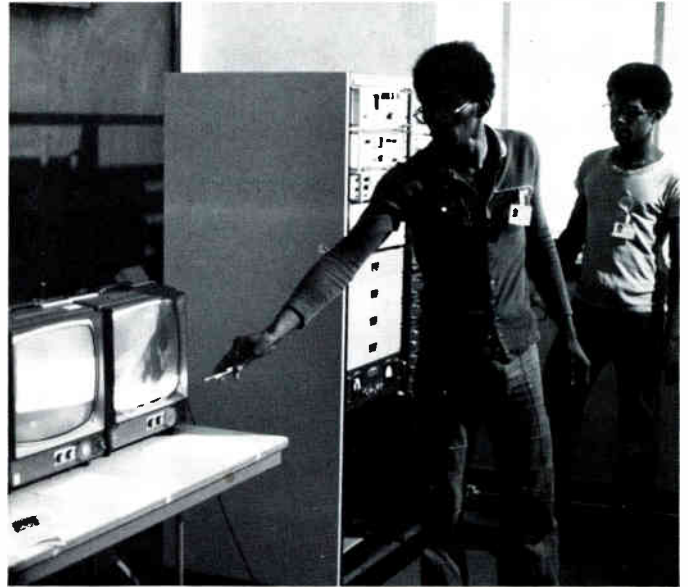
There have been varied estimates of cablevision industry growth through the next decade. The figures have been reported elsewhere, coming from think tank reports, the government and lending institutions. Some of the projections are taken seriously, some are laughed at, and some cause shudders up spines. Regardless of what any costly, meaningful, or

meaningless report might project, this industry *will* grow, perhaps in spite of itself.

Even if the industry merely "hangs around," it will grow. As it hangs around, it will require more trained people as installers, technicians, engineers, mappers, pole climbers, clerks and such. Where are these additional people going to come from?

# CABLE TELEVISION MANPOWER: DEVELOPING A RESOURCE

*Judith Baer, Associate Publisher*



## **Toward Solving the Problem**

A few years ago, some people with a very determined dream got together and thought up a program of manpower development for the cable television industry. Some of these people have gone on to other tasks, some have stayed with the program. Their dream however, continues—and gladly, it continues with success. They set out to help themselves, and they did it. They deserve recognition for fortitude and determination. They are succeeding.

The Miami-Dayton Manpower Training Center is located in Dayton, Ohio. It is the realization of hope. The facility is not particularly attractive to look at and would not win any prizes in modern school facility design contests. The building that houses the Garfield Skills Center, host of the Cable Television Training Classes, is old and rundown. That's not, however, the least bit important when you look inside the building and see the enthusiasm and pride that the people connected with this program display.

Miami-Dayton was designed to allow annualized "open-ended" training. Students enter the program, progress at their own rate, and move on to other more advanced training, or enter industry if they have fulfilled the requirements. The approach allows

prospective students to enter the training program at levels best suited to their particular capabilities, and to graduate from the program at levels which are applicable to their particular vocational interests and respective competency levels. It allows industry to absorb small numbers of program graduates on an ongoing basis instead of having all graduates enter the workforce at the same time each year. Such an approach also allows replacements to be made throughout the year, keeping trainee slots constantly filled and teaching loads consistent.

"Garfield Training Center is a Vocational Skill Center designed to take in and help people who have little or no skills and turn them into ones who are capable of performing a job," according to Center personnel. Federally funded under the Comprehensive Employment Act (a Department of Labor project), and implemented by the Miami Valley Manpower Consortium, the Center serves Montgomery County, Preble County and the city of Dayton. Outlying counties may "buy" into the training program. The program includes a G.E.D. course to assist students in attaining their high school diplomas, necessary for all employment.

The Center was established in 1965 under the Manpower Development Training Act of 1962. This Act

was passed by Congress to provide vocational skills training for disadvantaged youth and adults preparing them for fulltime employment. The Center meets complete criteria of a manpower development training skills center as established by federal guidelines and is under cooperative overall supervision of the Ohio State Department of Education. The Manpower Services Division of Vocational Education is federally funded under the Comprehensive Employment and Training Act of 1973, with prime sponsorship coming from the Consortium.

Garfield is well known in the greater Dayton area and is proud of their record with local employers. While training is based on state and GETA requirements, it is established to meet the requirements outlines by local businessmen. The feeling at Garfield is that each individual deserves the opportunity to receive sound training to prepare for the world of employment, a chance to learn self respect and learn to respect those around them.

### **Why Cable Television Training?**

During a recent Open House held by the Center, an operator was asked by C/Ed, "How can I do a story about a program that brings people in from outside the industry, when people in the industry are yelling for training themselves?" The operator answered that, "... since the industry was so slow in taking responsibility on its own, something had to be done to provide required additional personnel. The Miami-Dayton program is filling a need."

According to industry estimates, the cablevision industry employed around 24,000 people at March 1974 in capacities ranging from high level management to "service workers." Categories detailed on FCC Form 395 include managerial, professional, technicians, sales workers, clerical, craftsmen-skilled, operatives-semi-skilled, laborers-unskilled and the service workers. The 24,000 number is very approximate and comes from records of estimates by the National Cable Television Association. Actual reporting on FCC 395 Forms by systems required to submit, counted 17,300 at that March 1974 input date. Nearly 53 percent of that number is on the technical, installation and craftsman side of industry. If the industry has grown nearly 10 percent in number of systems since 1974 (which it has), and nearly 20 percent in numbers of subscribers since 1974 (which it also has)—then it is fair to assume that the manpower required to support that growth has increased somewhat accordingly. System growth is approximately 300. Subscriber growth is approximately 2 million plus. It is impossible to believe that employment has not increased substantially, and it is obvious that there is a great current demand, and is going to be an increasing demand, for qualified personnel to support future growth.

### **What's Going on at Miami-Dayton?**

Orientation is one of the most important parts of the CATV program, and each student receives a background on the Garfield Center, on the cablevision industry and responsibility in the business world. Students are tested for pole climbing skills and dexterity. Safety is promoted with complete training on

OSHA requirements, vehicle equipment safety, aerial bucket and work area safety, personnel safety, office, warehouse and outdoor safety. They become familiar with equipment and procedures throughout this phase of the project.

Pole climbing includes practices, exercises and preparation. Hand tools are covered, including their care. Equipment fittings, hardware and strand equipment are detailed. Stranding operations such as hoisting and grip techniques, single and dual strand pulling, trunk, figure eights, feeder and drop cable handling, are taught.

*[Editor's Note: Students at the Garfield Center are sent out for On-The-Job Training. When they return, they are required to report on what they encountered. This is the report of Tereasa France, the sole surviving female member of the first graduating class.]*

"We arrived at 7:45 a.m. with the other employees of Continental Cable. We were offered coffee while we waited for the installers to get their paperwork in order.

My teammate, Richard Jackson, and I left the building starting our runs at 8:30 a.m. The first stop was a CI (cable-in) connection. On this job I acted as a gopher (groundman) and got all the tools out of the truck. Next I did some map reading to find our next stop. Richard then showed me how to find a disconnect at the pole.

On our next stop we ran into a line that had been tapped into (someone stealing cable). We quickly repaired the line with burroughs. It was about 10:00 a.m. and we proceeded on to several NALC's (no answer left card), one complete installation from the pole, and two reconnects.

Since we were eager to continue, we cut our lunch short and got back to work.

Now we began to share the work. Richard let me do the complete set-up of A and B switches, make jumpers and asked my opinion before beginning a job. I put in two 2-way splitters and two 4-way splitters.

Unfortunately for the customer, but luckily for me, I got to see a disconnect after we had reconnected. I was able to see how to deal with the customer firmly but politely.

We had two installations where we had to drill inside the house and move the cable. One of these I did mostly myself.

All in all, I feel that the trip was beneficial to me as a trainee and to the company as a potential employer. I found that I was able to apply the lab training in practical everyday setup and the company was able to get an idea as to the areas the training school has covered.

I enjoyed the work day and hope that a similar work day experience can be arranged.

TEREASA FRANCE

Other basics of system construction covered in the program include trunk cable operation, strand mapping, tower and antenna construction, overhead and underground construction, and splicing. Drafting techniques including lettering, equipment and materials, geometric constructions, dimensioning, drafting department practices, map drawing, and

390



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graphs and charts, are completely covered. Preparing a job, what to expect and what not to expect from an employer, employee responsibilities, inventory control and daily work routing are covered under Work Experience in the curriculum.

Thirteen weeks are devoted to the subject of Basic System Construction, which is offered as Option A after the basic course in Installer/Technician is completed during an intensive 26-week period during the student's first year with the program. Each student is offered options that are tailored for specific talents and knowledge gained during that first 26 weeks. Option B is titled Basic Technical Operations and covers that topic with its work requirements in detail, as great as that noted here for Basic System Construction. These first series options are available during the third quarter of the training program and after a student has completed either of the above options, he can move on, if he wishes to, into more detailed and advanced training programs. Advance System Construction is offered as are classes in Advanced Technical Operations and CATV Distribution Systems Design. If the student has opted for the system construction portion of the program, he can't learn much more than the Advanced System Construction course offers unless he goes into the field. But, if the student wishes to enter the technical operations part of the industry, he can go on to, and graduate from an Advanced Technical Curriculum/Associate Degree Program.

These cable television industry oriented courses, plus the basic G.E.D., Math, Basic, Intermediate and Advanced Electronics, Customer Relations and FCC 2nd and 3rd Class License Preparation courses, produce a well rounded and capable person ready for immediate and useful employment to industry. Students are willing to relocate to other areas for employment and such details are worked out closely with cooperation of counseling personnel at the Center.

#### **How Did They Do It?**

In an August 7, 1975, letter to cable industry personnel, Amos B. Hostetter, Continental Cable, outlined some of the background of the Miami-Dayton program. While serving as National Chairman of NCTA in 1973-1974, Hostetter initiated and supported the creation of the National Cable Manpower Task Force, establishing a joint venture for researching manpower needs in the industry. The findings of that Task Force recommended establishment of a demonstration program to train underemployed and economically disadvantaged workers for jobs and career opportunities in the cable television industry. Those findings and recommendations were given to the Booker T. Washington Foundation/Cablecommunications Resource Center (BTW/CRC) in Washington, D.C. with the specific task of structuring a comprehensive proposal to seek financial support for such a program. If BTW/CRC could come up with some money for funding, NCTA would provide support in obtaining the necessary hardware and equipment needed to operate a CATV training program that would be the model for the rest of the CATV industry, according to Hostetter's letter.

BTW/CRC completed their part of the program early. Through the course of organizing the program, a series

of diverse personalities ran shotgun for the BTW/CRC responsibility. There were suspicions and problems through early phases of planning. Motives were questioned, personalities conflicted and each side had much to learn about the other. Remember that this program is for minority training and that personalities who are responsible for pushing such projects through have fought long and hard battles. They've won many with other industries, but when entering any new group, time is required for egos and problems to subside. Thankfully, because of ideals and sticking with the program, it all eventually came together. The cable industry learned to cooperate and understand better some problems that had not been part of its daily workload. Help from people like William R. Dabney of the East Bay Skills Center in Oakland, CA, was valuable as Bill had gone through much of this before.

Course outlines, curriculum, teachers, equipment, texts and manuals, schedules, installation of hardware, classroom timing and logistics, all had to be laid out properly in detail. This was no time for politics and personalities because the success or failure of this program would be a reflection on the entire industry.

It is impossible to name all the people who were directly or indirectly involved with this program. The curriculum was developed by a skilled group of industry people. Equipment requirements and their ultimate fulfillment were the result of donations from industry for the large part. Manufacturers and operators both donated hardware, and while most of the equipment was very useful and immediately put to use, many items required rework or repair. There still are requirements for equipment and if operators and manufacturers would look around their back rooms and inventory areas, the Miami-Dayton site would benefit greatly by more donations.

Belden, Comm/Scope, General Cable, LRC, Raychem, Tri-Comm, Cable TV Supply, Scientific-Atlanta, Sadelco, Tocom, GTE Sylvania, Aberdeen, Blonder Tongue, Hamlin International, Wavetek, W. M. Bashlin and Anixter-Prizan are among donors to the program. Oak Industries, Gilbert Engineering, Delco Moraine and Stotts Friedman helped out. Equipment was moved from the Wright Patterson Air Force Base and put to use. Utility poles were set outside for classes in climbing and installation. Inside, on table tops, a mockup system carries students through part of the program. Catalogs, assistance and instruction manuals were donated from Singer, AEL, Systems Wire, Texscan, Microwave Associates, Alcoswitch, Alpha, American Beauty, Amphenol, Antenna Specialists, Bogen, Bud Radio, Bussman, Calrad, Centralab, Chicago Miniature, Clarostate, Cornell Dublier, Daburn Electronics, Dialight, Enm Counters, Essex, Everready, General Instrument, Guardian Electric, International Rectifier, E. F. Johnson, Keystone Electronics, Kure-Klash, Leecraft, Mallory, MicroSwitch, 3M, Multicore Solder, National Controls, Pomona Electric, Quam, RCA, RCL, Reed Devices, Regency, Rohn Tower, Simpson Electric, Sola Electric, Sprague, Superior Electric, Transitron, Triad, Vaco, Vernitron, Wahl Clipper, Ward Leonard, Waldom Molex, Winegard, Wilton, Workman, and Xoelite, Inc. In reading over these names there still are some major industry suppliers who are not mentioned. Could it be

that they're just now getting around to donating hardware to this program?

### What To Do with the Graduates?

During the summer some 40 students of the Garfield program graduated. They found jobs in the industry and reports are very positive. Center Director Lloyd Lewis is pleased with the response and says, "We've had quite an experience here and we're really happy with it." While Lewis admits that problems still exist, he is optimistic about the program. "There is no doubt in my mind that we can do this job at the present time," he says.

Graduates of the program that started in October of 1975 are now employed in Gary and Huntington, Indiana, and in Toledo, Mansfield and Dayton, Ohio. Eight are working in Rochester, Pennsylvania, and one is in Bossier City, Louisiana. Jackson Communications Corp., headquartered in Clayton, Ohio, has taken 23 of the graduates. Dick Jackson, president, has revealed nothing but positive remarks about the people accepted with his company.

Lewis has inquiries from operators in Illinois, Michigan and more in Louisiana. Jackson Communications has told him that by October it will need as many as 150 cable technicians, a further reflection of the program's success. Lewis however, says that they'll only be able to provide 20 to 25 additional graduates by that date. Again, if equipment requirements could be fulfilled and additional support was provided by industry, there would be a possible increase in the number of graduates moving out of the program. When pole attachment disputes are

straightened out in Ohio, two major operating companies will require personnel. Viacom Dayton is committed to the program and has provided support as has Continental Cablevision of Ohio.

### What's It To You?

One of the unpredictable fallouts of this program will be the possibility of taking on training of people already employed in the industry. That is in the future, but it is a very great possibility. Companies could send personnel for updating, upgrading or basic instruction that is not available locally to the operator. Individuals who wish to move ahead but cannot find programs in local schools can visit the Center and learn what is required to progress through whatever series of goals the person might have set for himself. The industry can develop a resource pool for personnel requirements by supporting the program.

With the success of the Miami-Dayton Program, along with the experience and success of the East Bay Skills Center, the cable television industry is providing opportunity for minority employees to gain access to the industry. Similar projects are planned and on the drawing boards for the future but it is unlikely that the tasks will be tackled without total support of manufacturers and operators. Funding can be made available for payroll of instructors and costs of operating the facilities can be carried through government funding. The government, however, feels that industry must also donate to the project with guidance, manpower, equipment and potential for employment.

### Don't Stop Now!

Just because this report ends on a positive note, the industry must not sit back and let calls for assistance go unanswered. Operators can look in that back room and come up with test equipment, remembering that it should, in fairness, be operating properly. Engineers with workshops and laboratories stuck in basements and garages can find parts and components that haven't been used and send them along. Manufacturers have out-of-date lines of equipment that are not being aggressively pushed through a sales program that will do nicely for training purposes.

Everyone has something lying around the plant that can assist the continued success of this program.

Additionally, company management continues to have a responsibility to develop these students after they've come into the industry. Some people will rise to higher levels, some will do it more quickly than others. Some will stay where they entered. Others, indeed, will become disenchanted and perhaps leave the industry. They may go on to other industries, and if they do, we do ourselves a great disservice by having them leave with thoughts of limited personal growth. Each case will be an individual one, as each personnel problem always is particular and peculiar to the circumstances and the personalities involved. Acceptance, patience, understanding and learning are required from management. This may be a new experience for you and your company. We do have a responsibility and we must learn to accept it and deal with it. This "emerging," "burgeoning," "infant," industry is more than 25 years old. We'd better become adults.

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# CABLE TELEVISION MANPOWER: JOB DESCRIPTIONS AND EDUCATIONAL REQUIREMENTS

Judith Baer,  
Associate Publisher

In February 1973, the Department of Commerce, Office of Telecommunications in Washington, D.C., issued a report entitled *CABLE TELEVISION MANPOWER: Job Descriptions and Educational Requirements*. The report contains forty-five descriptions for technical positions in the cable television industry. The descriptions were prepared in the course of a study of cable television manpower needs conducted by Edward J. Roth, acting as a consultant to the DOC/OT. The study was performed with the cooperation of the NCTA, the IEEE, the American Institute of Aeronautics and Astronautics, the National Society of Professional Engineering and the EIA. It was found that there are no widely accepted job descriptions for technical positions in either the cable television owner/operator, the system construction, or the cable equipment manufacturing segments of the industry. The forty-five descriptions outlined in the report were drafted for discussion by all segments of the industry as a possible step toward development of generally accepted job criteria.

Roth's report came out of findings in a previous DOC/OT study estimating the demand for technical and engineering personnel in the cable television industry. Manpower demands were estimated by means of a survey of 2,612 cable television owner/operators, 100 CATV equipment and cable manufacturers, and 100 cable television system construction companies. It became evident during this investigation that there were no such descriptions accepted widely and that many companies have no written job descriptions whatsoever. The construction and manufacturing segments do have written descriptions, but according to Roth's report, they are designed for internal purposes only.

Additionally, it was found that there is a wide disparity in the industry concerning educational and experience requirements for engineering and technical work. Roth reported that one major multiple system operator "summed up his views with the comment that his company has no need for graduate engineers, and on his staff he has none." Roth goes on to say that, "Another offered the view that such lack of attention to the education background and training of engineers is detrimental to the cable industry." These divergent comments were echoed by other system operators during the manpower study, according to the author.

One of the questions in the survey questionnaire sought the views of industry on the type and amount of training they felt necessary for each job. The question was followed by a list of specific job titles appropriate to the respondent's type of company. The job titles were followed by either three or five categories of education and experience, depending on the nature of the specific

job. (Electrical engineering training categories were not included in instances where a graduate E.E. was not deemed appropriate.) Job titles were selected from lists supplied by companies in each of the three industry segments, and were those found to be most commonly used.

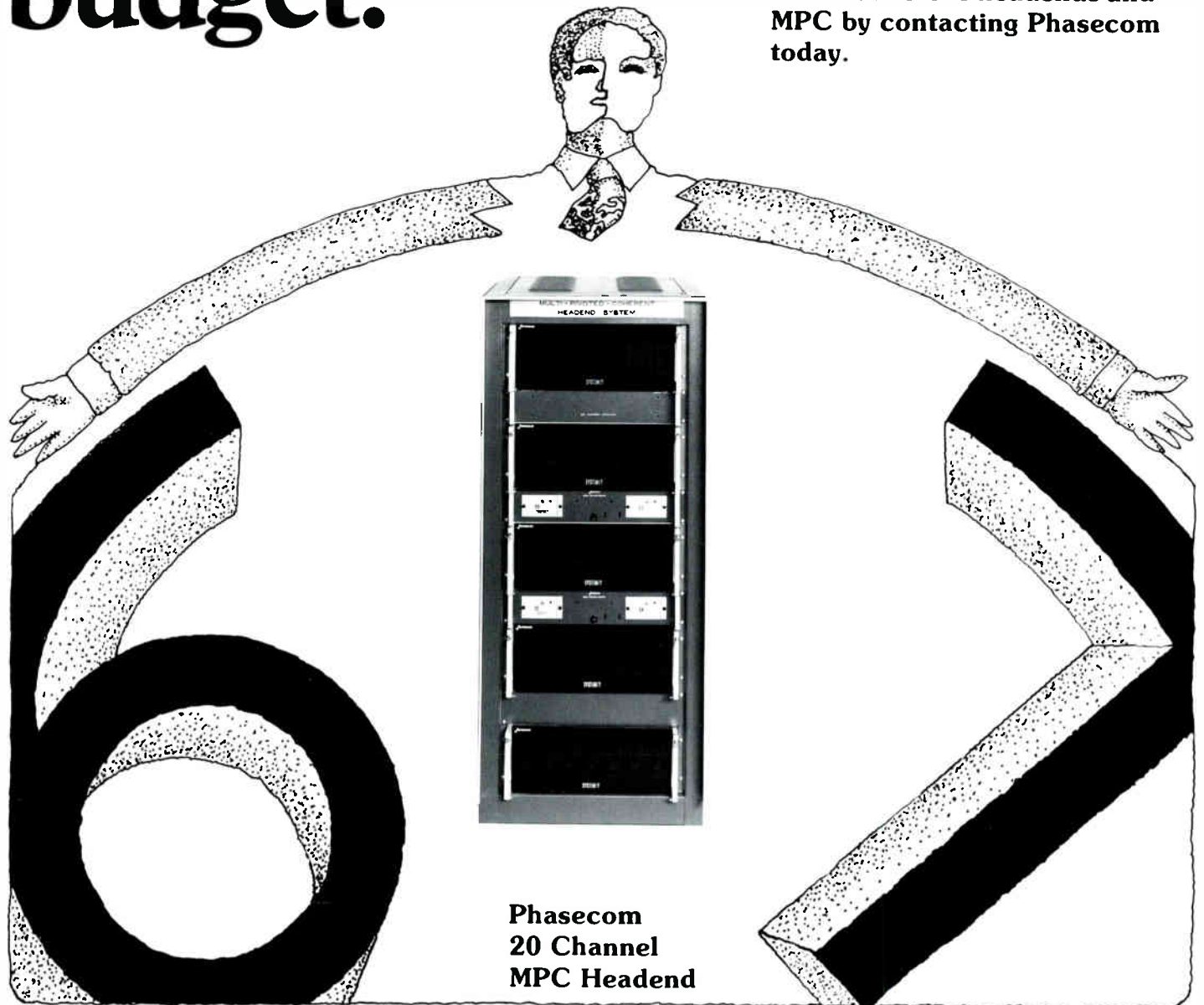
Cablevision industry owners and operators responded that an E.E. degree was an educational requirement for the title of Regional Supervisor, Plant Supervisor and Chief Technician. In all cases, there were responses that non-degreed people would be qualified for the positions, however the years of experience required increased greatly as educational requirements became less of a requirement. Bench, Systems Maintenance and Customer Services Technicians, as well as Installers, require only a high school diploma, according to the report. Some might have more formal technical training, but no detailed outline of such requirement is presented. The owners and operators were the largest number of respondents to the inquiry, but covered the fewest number of classifications and had much less to offer with regard to job descriptions and classifications.

The questionnaire also concerned itself with training required to make a person fully qualified for cable industry jobs. The research project asked for the relative amounts of classroom and on-the-job training which would be preferred by the respondent. The responses were generally independent of the particular job being considered, but did vary from one segment of the industry to another. Cable system owner/operators felt that about twenty percent of the additional training required should be in the classroom; the construction segment preferred about forty percent in the classroom; and the manufacturing segment suggested only about six percent additional training should be in the classroom.

The Department of Commerce estimated that in the 1970's alone, the cable television industry will seek 50,000 new technicians. It is fairly obvious that such a figure is not realistic since currently the industry employs an estimated 30,000 people totally across the board. Whatever quantum leap that is required to make cable television employ that many more people is still hidden in someone's development laboratory or in the recesses of brilliant minds. However, as former FCC Cable Television Bureau Chief David Kinley has been quoted as saying, "Technical training will become more important for both the regulators and the regulated as CTCA completes its work and as March 1977 approaches." Training is one part of the problem and must be considered only one area that deserves thoughtful consideration. Manpower is wasted when it is not put to its best use and encouraged to develop. □

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# CABLE TELEVISION TRAINING: A SURVEY OF EVENTS AND PROGRAMS

The following is a survey of programs available to cable television industry personnel with an interest toward self improvement. Programs have been reviewed, and where we believe they will be repeated, we have so noted. This survey does not represent all programs but is a descriptive survey of major events and local programs that we have been aware of through the past year.

**1st ANNUAL RELIABILITY CONFERENCE:** Sponsored by SCTE and IEEE in February 1976. Philadelphia, PA. 1977 site undetermined. Two days. 17 papers. Attendance 175. No exhibits. \$55 Registration.

**NCTA CONVENTION-TECHNICAL PROGRAMS:** Sponsored annually as part of national industry convention. Three days. Site varies. 1977 will be Chicago, IL. Average technical attendance at sessions, 100. Exhibits part of overall convention. Registration: \$150 est.

**CATA OPERATORS SEMINAR:** First event in August, 1976. Stresses "hands-on" and practical day-to-day system operation. No formal paper presentation. Three days. 1977 site undetermined. Table-top exhibits. Registration: \$50 est. Attendance: 150.

**EARTH STATION TECHNOLOGY CONFERENCE:** Sponsored by Scientific-Atlanta, industry supplier. First event July 1976. Repeat is not determined. Site: Atlanta, GA. Registration: Free. Two days. Attendance: 150.

**WESTERN CABLE TELEVISION CONVENTION-TECHNICAL PROGRAMS:** Sponsored annually. 1975 program staged by Society of Cable Television Engineers. 1976 meeting, December 1-4, Anaheim, CA. Two days. Formal papers and workshops. Attendance: 125 per session. Registration: \$50 est. Exhibits as part of convention.

**SOUTHERN CABLE TELEVISION ASSOCIATION MEETING-TECHNICAL PROGRAMS:** Sponsored annually. 1976 meeting in Atlanta, GA. Technical sessions hosted by SCTE. Two days. Papers and workshops. Exhibits are Table-top. Event is scheduled during fall months. Attendance: 100 per session est. Registration: \$15 with one full management registration.

**NORTHEAST CABLE TELEVISION TECHNICAL SEMINAR:** Co-sponsored by Upstate Chapter, SCTE and New York State Commission on Cable Television with the cooperation of the State University of New York. Annual event. Two days. Formal papers and hands-on workshops. No exhibits. Held in Northeastern U.S. Attendance: 150 est. Registration: \$10.



*The SCTE/IEEE Reliability Conference was the first of its kind and will be repeated in 1977.*

**SOCIETY OF BROADCAST ENGINEERS:** Staging 3rd NY Meeting, Nov. 7-8, 1976 in Hempstead, NY. Two days. Attendance estimated at 200. Table-top displays. SCTE participates. Registration: \$5.00.

**BROADCAST SYMPOSIUM:** Sponsored by IEEE Broadcast Group, part of Broadcast, Cable & Consumer Electronics Society of IEEE. Attendance estimated at 150-200. Annual event, fall months. Cable participation. Last two years hosted by Washington, D.C. Chapter. 1977 site undetermined.

**CANADIAN CABLE TELEVISION ASSOCIATION-TECHNICAL PROGRAMS:** Annual meeting. 1977 site: Calgary. Attendance est. 100 per session. Exhibits as part of the convention. Two days. Field trips. Registration: \$100 est.

**SPARTANBURG REGIONAL TECHNICAL SCHOOL:** Orangeburg-Calhoun Technical College, P.O. Box 1767, Orangeburg, SC. Contact: John Sherwood. (803) 536-0311. Ongoing programs in technical training.

**CABLE TELEVISION INSTITUTE:** Commercial school for people wishing to enter the industry. Site: 1025 Connecticut Ave., NW, Washington, D.C. 20036. Tuition for six-week course est. \$600. Provides job placement according to brochure.

**SOUTHERN TECHNICAL INSTITUTE, CATV SYSTEMS CONCEPTS:** Held program in Dec. '74. Sponsored by Dept. of Electrical Engineering Technology. Conducted by Dept. of Continuing Education, Georgia Tech/Southern Tech. No plans for repeat course. Registration: \$150. Primarily designed for currently employed CATV technicians. Four days. Georgia CATV Association sponsored. Marietta, GA.



The WCTC show provides two full days of technical programs in 1975. They'll repeat with new programs in 1976.



The Canadian Cable Television Association hosts well attended technical programs.



Tom Straw of Texas A&M chairs session in Washington, D.C.

**DAKOTA COUNTY AREA VO-TECH:** 11-22 month program for entry into industry. Materials and books cost \$200. Program is tuition free to high school graduates between 16-22 years of age. Sponsored by Minnesota Area Vocational Technical Schools, Rosemount, MN. Complete technician training. Assistance in job placement.

**THE GEORGE WASHINGTON UNIVERSITY, SCHOOL OF ENGINEERING AND APPLIED SCIENCE:** Continuing Engineering Education Program. Ongoing program. Cable Television Techniques and Usage, Communications Systems Engineering are examples of programs offered. Three to five day intensive programs. Designed for engineers entering industry or update to those currently employed. Washington, D.C. 20052. Tuition: varies around \$400.

**FERRIS STATE COLLEGE, BROADCAST ELECTRONICS TECHNOLOGY:** Located in Big Rapids, Michigan 49307. Preparation for employment in broadcast, CATV and CCTV, microwave, CB and two-way. Program leads to Bachelor of Science Degree. Complete studio facility. Sponsored through Electrical & Electronics Department, School of Technical & Applied Arts.

**CLEVELAND INSTITUTE OF ELECTRONICS, INC.:** Commercial program. Complete program of electronics training, FCC license, some dedicated CATV training. Correspondence course. Financing available. Accredited by National Home Study Council. G.I. Bill assistance. Tuition: \$695 lowest to \$2,195. Financing might add \$700 additional to cost. Mails promotional material weekly. Cleveland, OH 44114.

**GROSSMONT COLLEGE, ENGINEERING TECHNOLOGY CERTIFICATION PROGRAM:** Program designed toward Certificate of Achievement in Engineering Technology. 36 Units. Telecommunications-Television Certificate 43 Units. Includes FCC license, electronics and associated production. El Cajon, CA 92020. Public Community College.

**NATIONAL CABLE TELEVISION INSTITUTE:** Founded by industry publisher and cable system operator Stan Searle in 1968. Correspondence course. Company usually buys program. Installer, Tech I, Chief Tech range is \$300 to \$800 for individuals. \$200-\$500 when group purchase through company. Progress reports, consultation, graduation certificate upon completion of course. Board of Governors includes industry operators/engineers. Headquarters, Englewood, CO.

**TEXAS A&M UNIVERSITY, CATV SCHOOL:** Sponsored by Engineering Extension Service. Usually 2 or 3 sessions annually. One of the better known programs in the industry thanks to Tom Straw and his efforts. Cost: \$100-150 est. College Station, TX 77843.

**BOCES, ONONDAGA-MADISON:** Educational Communications Center. Various programs presented. Syracuse, NY 13209.

**CAPITOL RADIO ENGINEERING INSTITUTE:** Commercial correspondence school. McGraw-Hill Continuing Education Center. Academic Credit can be arranged for Home Study Programs. CATV is sold as "advanced electronics" in brochure with nuclear. Update, broaden, or enter industry. Cash prices for tuition range from \$570 to \$1,580. Financing will add to cost. Impressive brochures. G.I. Bill. Washington, D.C. 20016.

**UNIVERSITY OF WISCONSIN-EXTENSION:** Various courses in CATV Engineering for update on technology. Presented throughout the year. Tuition: \$400 average est. Milwaukee, WI 53203.

If you're really interested in the programs that are going on continually throughout the country, you may contact any of the organizations listed below and they'll be happy to put you on their mailing lists. Every one of these groups is sponsoring a number of programs, locally and nationally.

**COMMUNITY ANTENNA TELEVISION ASSOCIATION,** 4209 NW 23rd St., Oklahoma City, OK 73107.

**NATIONAL CABLE TELEVISION ASSOCIATION,** 918 16th St., NW, Washington, D.C. 20006.

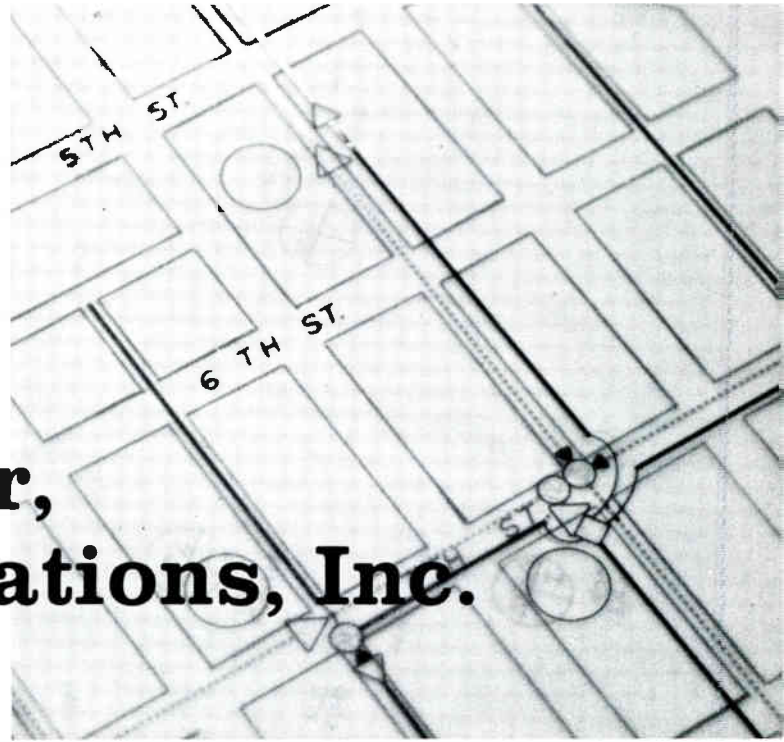
**SOCIETY OF CABLE TELEVISION ENGINEERS,** 607 Main Street, Ridgefield, CT 06877.

**INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS,** 345 East 47th St., New York, NY 10017.

When making inquiry, state your interest and your location so that local chapters, where necessary, can add you to their mailing lists.

Contact your state associations also; they have programs for technical people during many state meetings. □

# Judy Scharf, Design Engineer, Tele-Communications, Inc.



*By Sandra Treece  
Managing Editor*

Judy Scharf has finally exploded the myth, at least for me, that all engineers are really John Wayne. This engineer is a tiny lady, well dressed, attractive and very charming, who got into the cable industry about seven years ago. Her education includes two years at Bowling Green University and two years at the Cleveland Institute of Art. Art and journalism were her major areas of interest; she hoped for a career in advertising.

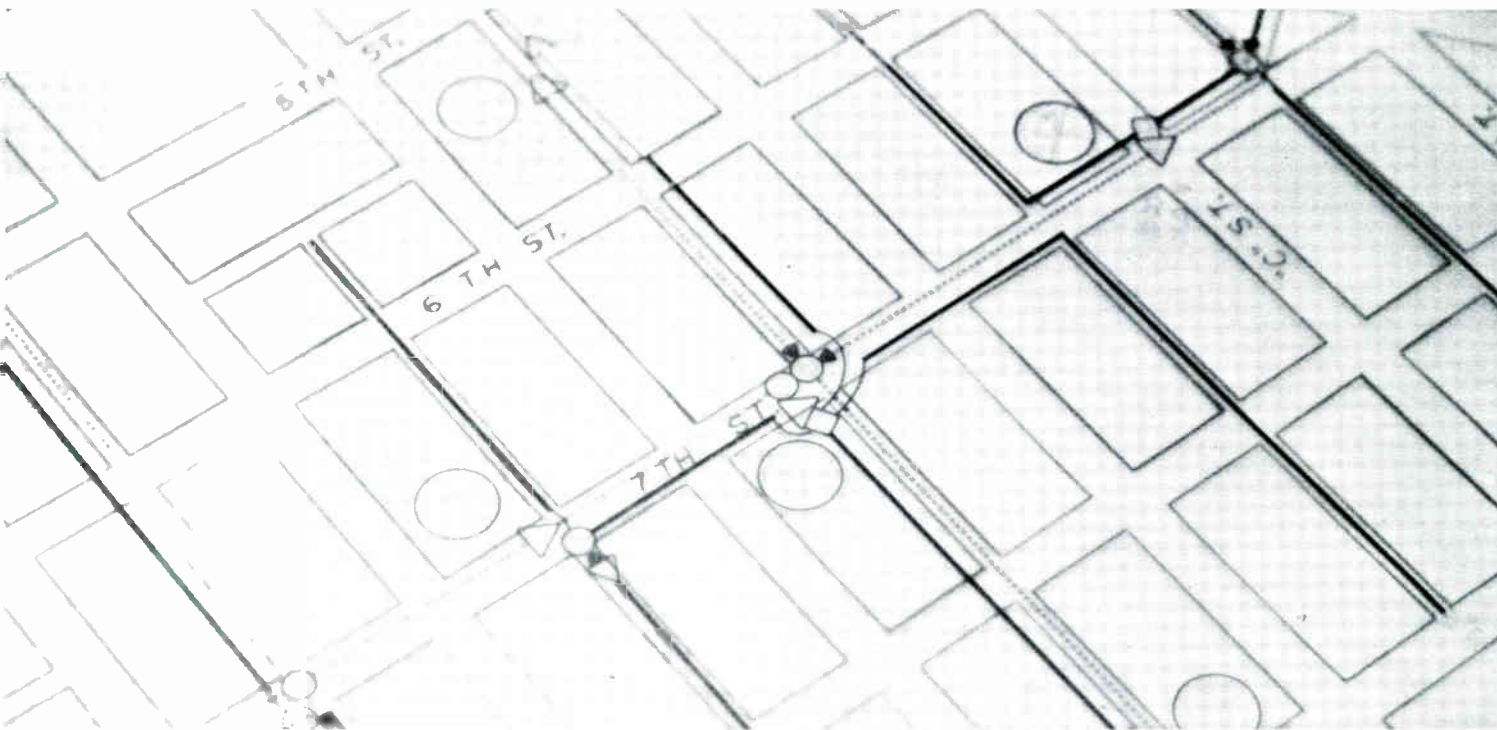
Determined to become gainfully employed after finishing college (and not really wanting to work at the low paying odd jobs available with advertising agencies), Judy found respectable and more lucrative employment as a draftsman. This proved a valuable learning experience and provided the basic skills which she continues to use. Judy worked as a draftsman for a civil engineering firm and did some mechanical drafting for a highway engineer.

When she started with Tele-Communications, Inc. seven years ago, she worked part time drafting for the company in her home. It was Dave Willis, TCI director of engineering, who got her interested in designing systems. Judy holds him in very high esteem, speaking often of his patience, understanding and knowledge of the industry. He took the time to encourage her, answer her questions, discuss her work, and, when she was ready, he turned her loose on her own.

Judy describes her job as really beginning after the franchise is acquired. Dave Willis and other executives decide, based on economics and availability, what equipment will be used; that is, what type of cable, active devices, taps, etc. Also determined then, are frequencies, losses, gain and whether or not a return







system would be employed. All this information, and more, is laid out on a "parameter sheet" and given to Judy. Her design must fit within those parameters.

With system maps, pole maps and street maps plastered all over the walls, Judy begins the design. She feels it is most important to "think of a system in its entirety." What needs will the system be expected to meet? What is the growth potential of the area? Who are the subscribers or potential subscribers? And, what can be done to give the end user "the best possible picture over the longest period of time?"

Judy feels very strongly about the actual field work and its relationship to her work. Says Judy, "Field and office must have a close relationship. I don't want anyone hanging over a cliff to install one of my amplifiers. It would be very helpful if I could tour every system before I begin the design, but, that's not economical. I have to depend on the field crew to keep me informed. The more information they give me, the better design job I can do."

TCI Head of Construction Doug Woirhaye and Judy have a symbiotic relationship. "He helps me visualize."

Judy emphasizes keeping costs down as the important part of her work. Contending that it saves dollars, over and over again, in employee's time, equipment replacement costs and subscriber retention, she is particularly determined to keep down potential maintenance costs.

Keeping up with the industry is essential and Judy finds industry journals and publications the most valuable source of information. "Reading is not something you can afford to put off until you have the time," she says. "I am, of course, most interested in

those articles and papers directly related to my field, but I read everything I can. This is an exciting industry and I want to know as much as I can about all of it."

She foresees fiber optics as having the most exciting influence on the industry, from a system design standpoint, citing the potential capability for reaching more people for less money.

The one professional organization to which Judy belongs is SCTE. She spoke favorably of the work it does and the opportunity it provides for the exchange of ideas. Her only suggestion was that SCTE start a chapter in Denver—and she's willing to help with that.

As far as women in her field are concerned, Judy feels there could be more. The opportunity is there. She says, "A woman may need to work longer to prove herself, but that's probably more because so few have been interested in the field and not because of discrimination. I personally am not in this industry to hop on a bandbox or to prove anything. I would also advise women considering this field that there are many aspects of the job that are unglamorous and there are menial tasks included. Any woman who is interested in system design should know that there is no such thing as starting at the top. More courses are available now on design; but, they are no substitute for on the job training. I recommend drafting courses, at least, learning as much as possible about the equipment and the industry and letting people know how interested you are."

Judy likes her job, she likes the people she works with and I think the industry is going to hear more from her. As a matter of fact, I asked her if she would write an article for a future issue of *C/Ed*, and she said she would. □

# Interview with James R. Palmer, President, C-COR Electronics, State C

**C/Ed:** What do you define as a "professional" engineer when speaking in terms of CATV?

**Palmer:** A degreed engineer or the equivalent. I'm hardnosed about it.

**C/Ed:** Equivalent being how many years of doing what?

**Palmer:** Well, to be equivalent—equivalent years of book learning, math, physics and electrical engineering.

**C/Ed:** Whose fault is it that the industry hasn't made demands nor really developed what you term "professionalism" in CATV engineering?

**Palmer:** The managers and entrepreneurs basically. They've done very well, seeing to it that they have sharp young MBA's coming along on the business side. **We've got plenty of well educated professionals in that area. But, we don't have enough in the other area, that being engineering.** In one of my C-COR newsletters a few years ago, I mentioned this problem and raised the ire of many engineers in CATV. After that, Monty Rifkin and Doug Dittrick moved to get some professional engineers into ATC. Dittrick has done the same since he joined Viacom and Al Stern at Warner also. I think that I made a visible impact on the topic.

**C/Ed:** C-COR markets a "reliability guarantee." What's so important about reliability?

**Palmer:** The word is bandied about, but it must have some importance to the industry vis-a-vis the SCTE Reliability Conference that was very well attended a few months ago. **But, I'm afraid that industry leaders, the people responsible for bottom line results of our industry, give little more than lip service and have very**

little idea about what is involved with respect to the reliability of their systems.

In a paper on Reliability that I presented at the NCTA Dallas Convention, I attempted to relate reliability on the dollars-and-cents basis: Relating it to failure rate and numbers of customers lost, or not gained. I think our industry leaders, whether they count a customer as \$300 value or as \$84 cash flow, must recognize that each customer represents dollars. Loss of customers is loss of dollars and, therefore, reliability certainly does have an importance.

**C/Ed:** Is reliability more important with the advent of pay-cable? Might that help us teach management the importance of reliability?

**Palmer:** There is a double-barreled effect here. The same relationship curve of customers-lost-versus-failure is also customers-lost-versus-quality. When you get into pay service where the customer is looking at a single channel on a high premium basis, then quality is extremely important. The failure of the system in the middle of an \$8 movie is going to affect whether that customer remains a customer or not and whether his neighbor becomes a customer or not. Each is relating his problems with quality and reliability.

**C/Ed:** How do you build reliability into your product line? What makes a piece of hardware reliable?

**Palmer:** I have four steps that give C-COR its reliability performance. Temperature is extremely important. Failure of a component is a function of its temperature. The chemical rate law states that, for every 10° C rise in temperature, failure rate doubles. Equipment must be well designed thermally to dissipate heat. We feel that we lead in this area. We have a temperature rise of 11° C in our trunks and 13° C in our extenders. Nobody else reaches those numbers and some are horribly far from them.

Our second point in reliability is very tight level control. C-COR uses a two-pilot system with modulated pilots. With the modulations, we can use an AC amplifier instead of a DC amplifier. The AC amplifier is

inherently much more stable and more reliable. Our systems operate on a "hands-off" basis and keeping hands off further enhances reliability.

The third point is gold. All of the solid-state devices, such as transistors and hybrids, are the latest gold technology. That has two advantages. One is the heart of the transistor, which is of low third order distortion design. This feature has only been available within the past six to nine months. The interconnections, wiring and plating within the transistor or hybrid itself are also gold. Earlier, aluminum was used as part of the metal system, and gold far surpasses aluminum as it has predicted reliabilities which are two times to maybe an order of magnitude better than other metal systems, although manufacturers are still arguing this point.

The fourth item is the power supply. Failures in equipment have generally been about half power supplies, half RF sections. The power supply is extremely important. We have done a very thorough job of designing and field testing a power supply that is very reliable. We have protected the power supply in many different ways: In redundant ways to enhance its reliability.

Our first amplifier for cable television was cable-powered. It was also messenger-mounted. It was a tube amplifier in 1953, but every cable amplifier we have ever made for cable powering has had a power transformer. I like the mass of a piece of iron between the power company and our electronics. Then, we developed the surge protection module which we're selling by the thousands to help people with other amplifiers. In addition, we use zener diodes to protect critical points in the power supply itself.

**C/Ed:** Is your feeling about reliability the result of your involvement with any other industry such as aerospace, or are they simply demands that you feel are required for cable television?

**Palmer:** Well, we do some engineering and manufacturing of amplifier components for military and industrial application. All of our printed circuit boards are glass epoxy with two-ounce copper, not one-ounce, which meets MIL-Spec requirements, as we only have one quality pc board in the house. We use double-sided boards which we feel are required for good VHF operation. This has enhanced our reliability. We sold a number of amplifiers to a military project a few years ago and they ended up as nose cone amplifiers for high-altitude sounding rockets. The customer returned one of these pieces to us for our historical display after it had been shot up beyond the atmosphere a couple of

hundred miles and recovered from the Pacific Ocean—and the amplifier still played. The unit was originally purchased as a commercial amplifier not to MIL-Specs, but C-COR's construction and quality survived that very hostile environment and impact into the ocean.

We thought a few years ago that we'd let our industrial work die out. However, people have kept buying amplifiers and that business has had an upturn. Other related side effects include a very good customer, Collins Radio. They are using our CATV components within their ATX-101 telephone system. They've developed another system for deep mine communications where reliability is of utmost importance, particularly with regard to mine disasters. We've done additional development for them on both the ATX-101 and the mine system and developed a reversible two-way amplifier for the mine system so that the forward becomes the reverse and the reverse becomes the forward in case of a mine cave-in. The two ends of the loop reverse so that communications remain constant, and as important, instant.

**C/Ed:** In past years you have been active with NCTA and EIA committees. You are currently on an EIA committee developing standards for CATV. What are they doing and why?

**Palmer:** Well, I am part of a small ad hoc committee of the Broadband Communications Committee of EIA to develop technical standards for the industry. It is my personal feeling that meaningful performance standards developed by nongovernmental groups, have great validity and are of great value to industry. I don't see that NCTA (or an organization such as NCTA) would have anything but difficulty developing such standards because of the different factions within the industry often thinking that the standards discriminate.

**C/Ed:** How would they discriminate?

**Palmer:** Economically, if for no other reason. Standards developed by a trade association could be felt as being a flag to regulators that these are numbers that regulators can grab hold of and force upon the industry. **I think that a separate organization such as EIA, which has considerable stature as a technical body that has developed many standards down through the years, can develop and present such standards for an industry that are simply available as reasonable, economic performance standards that can be referred to by anyone.** They actually stand by themselves so that regulators really back off from their posture of forcing any compliance to a set of numbers.

**C/Ed:** Should standards for a commercial communications industry such as cable television be more or less stringent than those required on military specifications and standards? Why not use the same numbers?

**Palmer:** Well, I think that military specifications, performance specifications, tend to be more involved in paperwork requirements and I just don't like them. I think that they are generally uneconomical to the point of being ridiculous. I don't think their standards would

be pertinent since they have so little expertise in television distribution. Let them, too, refer to an EIA standard.

C-COR has been involved in military applications by supplying a number of systems for aircraft carriers. The requirements were of a mechanical nature such as having amplifiers withstand shock. Aircraft carriers are subjected to a great deal of shock due to the firing of catapults. Equipment is evaluated on that basis. They looked at shock and vibration but did not tell us how the amplifiers should perform. They accepted our specification.

**C/Ed:** Do you see conflicts between measurements standards that NCTA has brought out in draft form and what is being developed within the EIA Committee?

**Palmer:** No. I think those two standards will be complementary to each other. System measurement is a good place for the NCTA committee to function, and assuming that NCTA has done a good job there, this tells me (and I hope the regulators)—that the regulators don't have to do that job, since industry has already done it. We need one set of standards, not multiple sets. Our government, and our trade associations, should not waste money duplicating the same job.

**C/Ed:** You announced that C-COR showed a profit during your last Fiscal Year and that announcement received quite a bit of press coverage. What percentage of that performance do you attribute to the cable industry? Is it industry growth or from other C-COR activities?

**Palmer:** That profit was mainly from the cable television industry. Other business was in the order of ten percent of our total business. But, while that ten percent doesn't contribute greatly profit-wise or volume-wise, I think its biggest contribution is to keep us on our toes technically. To know what other people in other industries are doing is a benefit. We do, however, try to keep our work related, technique-wise.

**C/Ed:** Did you increase your share of the market, was the year better, was there more construction than in 1975?

**Palmer:** **Our profit was probably due to not having horrendous inventory problems as some of our competitors had.** We were able to effectively reduce our operations drastically and very quickly, and were able to salvage some profit despite the downturn in business.

**C/Ed:** So it was a matter of internal management?

**Palmer:** Internal management or maybe good luck. Plus, a nice upturn in business at the tail end of the year. **We're projecting a 40 percent increase during 1976.**

**C/Ed:** Where is that business going to come from? New build, rebuild, pay-cable?

**Palmer:** Well, we're finding it both in new build and rebuild. We're not into pay-cable. Pay-cable is, however, generating money for expansion and it is making people more aware of quality.

**C/Ed:** What do you think about the FCC's removal of the 1977 rebuild requirements?

**Palmer:** I think it's a very decided boon for the industry and especially for the equipment manufacturers. In our free-enterprise system, the entrepreneurs of our industry and of our country react much better when they are told what to do. Many of the systems that should have been rebuilt were not going to

be rebuilt under the gun. Once the gun was removed from the businessman's head, he looked at his system on an economic basis and with that look, determined that he, in fact, should rebuild his system and those rebuilds are progressing currently.

**C/Ed:** What would you term as the greatest weakness in the domestic cable television industry?

**Palmer:** I guess that, as an engineer and former cable system operator, I still believe that there are too many systems out there that are not performing as they should. **The customer is not getting the quality of picture that he should nor the quality of picture that he is paying for.** A lot of the work that I am doing is pointed in the direction of solving those problems. Quality equipment, quality performance, my work on performance standards, the EIA ad hoc committee—I hope it helps solve those problems. Our industry will be a lot healthier and more profitable when our business managers see the importance of providing quality.

**C/Ed:** What about manpower?

**Palmer:** I don't think there is a manpower problem. I think that the so-called manpower problem is a result of myopic vision. When I served as chairman of NCTA's Education and Training Committee, my view then and now, is that trade schools, colleges and universities do an excellent job of training. But, our industry has been unwilling to hire either an Associate or B.S. degreed technical person, and to utilize that person within the industry.

**C/Ed:** So it's a recruiting problem?

**Palmer:** The industry wants to hire a "cable" engineer or a "cable" technician. They do not exist. You can, however, hire well trained and competently educated technical people and teach them all they need to know about cable so that they function effectively in a relatively short period of time. I dare say, that at one time, between C-COR and CenterVideo, I had 300 employees and that within my 23 years in the industry, I've hired a few thousand people. During that period, I've hired fewer than ten people from within the industry. **It is not necessary to hire people from other cable TV manufacturers or operating companies to get a qualified person.**

**C/Ed:** I don't see an NCTA Education and Training Committee on the roster. What happened?

**Palmer:** I don't know. I got "fired" from that position and sort of lost interest after that.

**C/Ed:** What do you expect from the cable television industry?

**Palmer:** I see an orderly growth. Not at the 1973 rate, but it's going to be at a very substantial rate and maintained over a period of years. I'd opt for somewhere between a 12 to 15 percent compounded growth.

**C/Ed:** Where will the growth be? Urban or suburban markets?

**Palmer:** I believe it will come in the urban areas. I believe in the "blue-sky" of the cable television industry. But, I believe that one of our previous problems was that we pushed the "blue-sky" so much to others that we started believing it ourselves, to the point of being totally uneconomic in many of our approaches. I believe that the "blue-sky" is still a reality, but that we must be cautious and remain practical in our approaches to it. □

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## critique/letters

Dear Sir:

The articles "Fiber Optics—How it Works" and "How Teleprompter's Fiber Optics System Works" served well to bring the new optical fiber communications technology to the attention of cable TV engineers. However, the unqualified statement on the broadband capability of the optical fiber transmission systems may give the incorrect impression to those unfamiliar with the technology. It should be pointed out that the transmission bandwidth of the optical fiber is inversely proportional to the length or square root of length of the fiber depending on the dispersion processes involved. This means that an optical fiber with a 500 MHz bandwidth over a 1 km length may have much less than 160 MHz bandwidth over a 10 km length. Also, if we consider intensity modulated (IM) analogue optical transmission systems where a frequency division multiplexed (FDM) scheme is used to transmit a multiplicity of TV channels, the total optical power produced by the light source is divided among the channels. Therefore, because of the limited power coupled into the fiber, with currently available light sources, it may be difficult to transmit more than a few TV

channels over a single optical fiber by using an IM analogue optical FDM scheme. The optical fiber trunk line may very well be required to use spatial division multiplexing. For digital TV signals which have high bit rates (>80 Mb/s for PCM color TV), the bandwidth of the optical fiber may even be more restrictive for multichannel transmission.

I believe a concise but in-depth review of the optical communications technology as applied to the cable TV industry would be of great value to your readers.

*Elmer H. Hara, Communications Research Centre, P.O. Box 11490, Station "H", Ottawa, Ontario.*

Dear Sir:

Reference is made to the CATV Off Air Interference Chart which was contained as pages 42 and 43 of the fall edition of CableVision's Tech Review.

This chart is the first that I have seen which displays the frequency spectrum used by cable television. It would be most useful to this office, if we were permitted to reproduce this chart for use by the Interdepartment Radio Advisory Committee. I therefore request your permission to reproduce thirty copies of pages 42 and 43 of the fall edition of CableVision's Tech Review.

*S.E. Probst, Acting Assistant Director for Frequency Management, Office of Telecommunications Policy.* □

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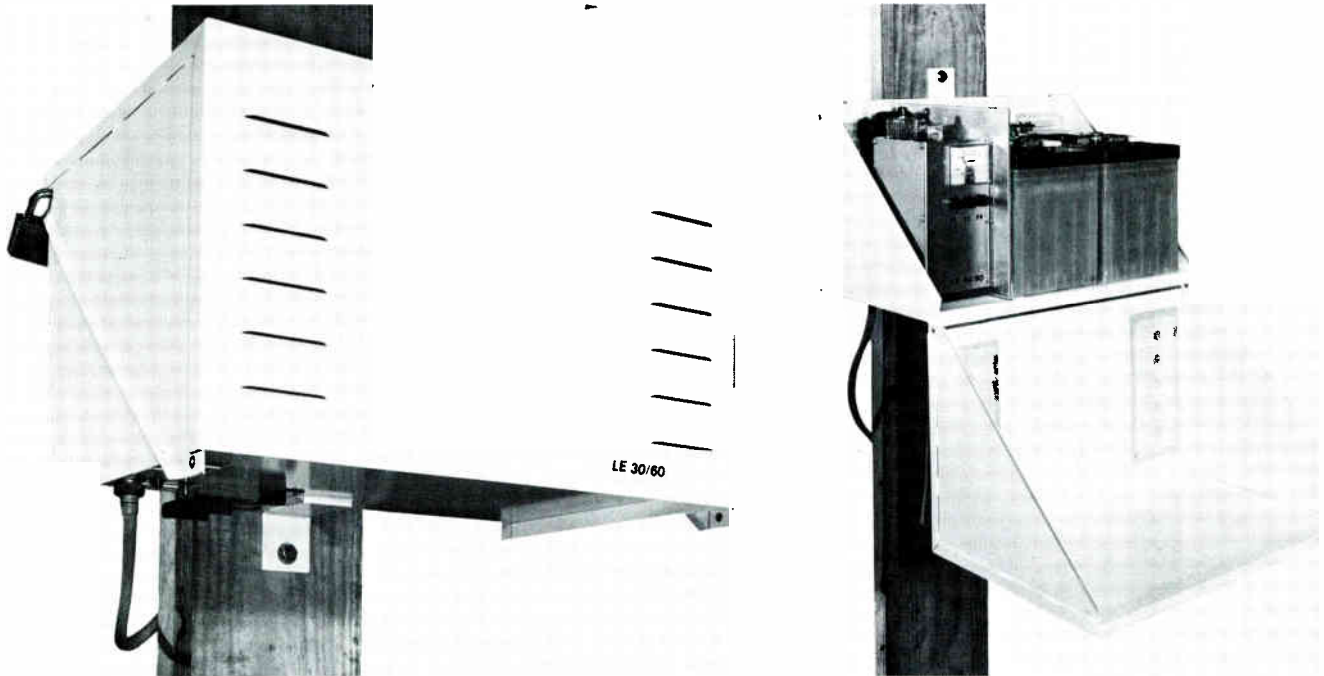
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**PATENT NO. 3861770  
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