

A TRAINING CATALOG

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ABSTRACT

In a maturing cable industry, operating costs and expenditures tend to be more closely scrutinized so as to insure optimum cost-effectiveness. At the same time, employee productivity and quality of service should not be compromised.

Often, training is overlooked as both the day-to-day and long-term link between cost-effectiveness and quality and productivity.

Using a training topics matrix of available course material and desired results, this paper will discuss outside training sources and how they can be constructed into a highly cost-effective, custom-designed, individualized technical training program. Also included is a thorough, annotated catalog of training resources.

THE TRAINING PARADOX

The absence of CATV-specific technical training, either through in-house training departments or outside resources, is not a new problem to the technical-intensive industry. But at a time when rebuilds have subsided, pay services have plateaued, and operating systems are working harder to keep subscribers and upgrade their services, CATV technical training, and the costs associated with it, indeed becomes a paradox. While most companies are trying to scale back operating costs, at the same time, rising costs associated with outages, callback, and new complexities from VCR connections and competition from backyard dishes, as well as the new Communications Act of 1984 franchise renewal pressures require that cable companies pay particular attention to signal service quality and technical integrity. So instead of cutting back on training as an operating cost, many cable operators are discovering that

more training commitment is necessary to lower operating costs, and that it is now a key ingredient not only in maintaining quality service, but also in providing motivation and support for technical employees, thereby affecting productivity and bottom-line profitability.

But, how much of the training responsibility is the company's? Will the company have to develop its own in-house training department and facilities to provide customized, quality training? What is the most cost-effective approach to training that also yields the desired results?

THE TRAINING COMMITMENT

The first step in any new training program should be the solid commitment by company management to encourage and promote training for all employees, technical and non-technical. Regardless of how many training dollars are spent by a company on its employees, if the participants do not perceive the company as an enthusiastic player and see some real attainable benefit to themselves, then those dollars are wasted because real learning through motivation will not occur. More importantly, companies should develop a written training commitment and policy stating exactly what management's responsibilities are and how the company will fund the program regardless of how the training program is structured.

Example: It is the policy of the Company to encourage employees to enroll in accredited educational institutions and/or special training courses designed to improve on-the-job performance and help prepare the individual for greater responsibilities.

Enrollment in such courses may be at the recommendation of either the Company or the employee. However, in all cases where reimbursement is requested, the course must be approved by the employee's department head and the system manager prior to enrollment.

If the Company requires the employee to take the course, then 100% of the course fees, plus books and out-of-town travel are paid by the Company. If the course is directly applicable to the employee's job, the Company will reimburse the employee for 100% of the course fees upon successful completion of the course. Other courses, which bear some relationship to the employee's job or to his/her career development in the Company, will be reimbursed for 75% of course fees upon successful completion of the course.

Along with this written statement of commitment, management must also determine the nature or structure of the training program: an in-house training department, vocational schools, or an eclectic approach using outside resources.

THE ECLECTIC APPROACH

The ultimate goal in any technical training program is to develop the technical employee through training and experience to the company-desired standard of performing the current job as well as to prepare selected employees for added responsibilities at higher levels. There are several ways to structure and develop a technical training program geared to meet this goal. A few companies have chosen to develop a complete in-house, self-supported training program requiring its own training center and staff. Others may take advantage of vocational schools or local colleges for CATV technical training while still others may completely depend on correspondence programs or contracted in-house presentations. Although all of these approaches have merit, at this

point in the industry, an eclectic approach, or the piecing together of a training program from a variety of sources, may indeed prove to be the most cost-effective while producing more than adequate and acceptable results. In fact, this approach to technical training draws from all of the above resources and combines these into a program to fit both the company's and student's needs.

The advantages of this method are many. For one thing it does not require the kind of full time staff or financial investment as that of an in-house training department. Secondly, by using outside sources, the training content should be continually updated to fit the needs of the industry. Third, the employees are not away from their jobs for extended periods as is required for vocational school attendance, maintaining productivity while learning specific on-the-job skills. Also, this approach takes best advantage of the "none of us are as smart (in training approaches, materials, strengths, etc.) as all of us together. Finally, and most importantly, this training approach allows the most flexibility for the student not only in subject areas but in timing as well.

TRAINING SOURCES

Many sources of technical training already exist and are the foundation of this type of training program. Sources include correspondence schools and self-study programs, local and regional short seminars, contracted in-house presentations, local community college evening courses, and other CATV operating companies' training centers. In addition, training topics range from CATV specific and electronics to management and data communications, all relevant to the progression of technical personnel.

The matrix below lists training sources by company name and indicates the respective subject or areas of training. For more information about the specific sources, see the "Training Resources" list included in this paper.

TRAINING TOPICS MATRIX

NAME	CATV TECHNICAL	ELECT- RONICS	ENGR	COMPUTER	DATA COMM	CAD	FIBER OPTICS	VIDEO PROD	MGT/ SUPERV	CUSTOMR SERVC	SAFTY	PRODUCT SPECIFIC
AMA-EXTENSION INSTITUTE				X					X			
AMERICAN INSTITUTE				X								
AMERICAN MEDIA									X	X	X	
AMN ALVIS TRAINING												
ARTHUR ANDERSEN/EDUC SERV									X			
ATC NATIONAL TRAINING CENTR	X								X			
AUBREY DANIELS & ASSOC									X			
BERG WALL TRAINING SYSTEMS		X		X		X			X		X	
BLONDER-TONGUE	X											
C-COR ELECTRONICS	X											
CATV TECHNICAL TRAINING SEMIN.	X											
CENTER FOR ADV PROF EDUC					X							
CENTER FOR CREATIVE LEADERSHIP									X			
CHILLICOTHE VOCATIONAL		X										
CLEVELAND INST. OF ELECTRONICS		X										
DAKOTA COUNTY VOCATIONAL	X											
DARTNELL									X	X		
DATA-TECH INSTITUTE				X	X							
DATACOMMUNICATIONS					X							
DATAPRO RESEARCH CORP					X							
DIGITAL EQUIP/ EDUC SERV				X								X
DSI MICRO INC				X					X			
DUN & BROADSTREET BUSN EDUC SRV									X			
EAGLE SEMINARS								X				
EAST BAY SKILLS CENTER	X											
ENTRAINMENT										X		
ESSEX COUNTY COLLEGE		X										
GENERAL SERVICES ADM		X									X	
GEORGE WASHINGTON UNIV			X									
GILBERT ENGINEERING	X											X
HAINES ASSOC.									X			
HARVARD BUSN RMW-REPRINT SVC									X			
HEATH COMPANY		X										
HENKELS & MCCOY	X										X	
HEWLETT-PACKARD												X
HUGHES MICROWAVE ASSOC.	X											X
ICS-INTERT		X										
IEEE SERVICE CENTER			X	X					X			
INFORMATION GATEKEEPERS, INC							X					
INST ADV TECHM/CONTROL DATA				X	X				X			
INST FOR PROFESSION EDUC			X	X					X			
INTERFERENCE CONTROL TECHM.			X									
JERROLD	X											
KNOWLEDGE INDUSTRY PUBLICITN								X				
LDI INSTITUTE									X			
MAGNAVOX CATV SYSTEMS INC	X								X			
MCGRAW-HILL TRAINING SYSTEMS												
MERCER COUNTY COLLEGE	X		X					X				
MIDDLESEX COMMUNITY COLLEGE	X							X				
NCTI	X							X				
NEW YORK UNIVERSITY						X						
NORTH TEXAS STAT UNIV				X					X			
NRI SCHOOL OF ELECTRONICS		X		X								
OMEGA SCHOOL OF COMMUN	X	X										
PROGETT-THOMPSON									X			
PHILLIPS PUBLISHING INC,	X				X							
PRYOR RESOURCES									X	X		
RESOURCE									X	X	X	
SCTE	X								X			
SHELDON SATIN ASSOC										X		
SMU-COX SCHOOL OF BUSINESS			X							X		
SOFTWARE INST OF AMER.					X							
SOUTH OKLA CITY JUNIOR COLLEGE		X										
STAT-A-MATRIX INSTITUTE			X									
TELEMETRICS INTERNATIONAL					X				X			
TELESTRATEGIES					X							
UCLA EXTENSION			X	X	X							
UNIV COLLEGE - CINCINNATI	X								X			
UNIV OF MICHIGAN/ SCH BUSN AD									X			
WADENA AREA VOCATIONAL	X											
WISCONSIN INDIANHEAD TECHM	X											

Figure 1. Training Topics Matrix

As is obvious from the matrix, there are many training resources to draw from and many topics to choose from in designing an eclectic training program, and this matrix is still not exhaustive. By using this matrix one can easily design any form of needed short-term or long-term training program not necessarily uniform for all employees, but individualized for each technical employee to address specific needs.

A basic, boiler-plate technical training program can more than likely be applied in most circumstances with only slight variations. The more complete and thorough the basic program is, the more it will cost, but the more flexible it will be as well. Following is an example of a very basic training program designed to be applicable to almost all CATV technical employees beginning with Installer and following all the way

through to Chief Engineer.

Basic Training Program Boilerplate

SOURCE NAME	TRAINING TOPIC	FORMAT	TIME REQUIRED/ ALLOWED	PRICE
NCIT	Installer	Self-study	2 years	\$240
Local	CPR	Seminar	2 days	\$75
ICS	Technical Mathematics	Self-study	1 1/2 yrs	\$330
MRI	Specialized Communications Electronics	Self-study	2 years	\$835
NCIT	Technician	Self-study	2 years	\$500
Magnavox	Mobile Technical Training Seminar	Workshop	3 days	\$300
ANA	Writing for Success	Self-study	6 months	\$95
NCIT	Chief Technician	Self-study	2 years	\$610
Hughes Microwave	Microwave Basics	Workshop	5 days	\$0
Datapro	Data Communications I	Seminar	3 days	\$695
Jerrold	Special Technical Session	Workshop	4 days	\$295
IEEE	Management Program	Self-study	1 year	\$400
Datapro	Data Communications II	Seminar	3 days	\$695
SCIE	NCI/E Certification	Self-study	2 years	\$50
ANA	Time Management	Self-Study	6 months	\$95
Cleveland Inst.	AAS in Electronics Engineering Technol.	Self-study	4 years	\$3,000
UCLA	The Technical Mgr in a Dynamic Envir	Seminar	3 days	\$875
				\$9,090

Figure 2. Basic Training Program Boilerplate

Following this 18 year program, the company would spend roughly \$505 per student annually, depending on the student's progress and interest in advancing. A more complete training program, Figure 3., requires the company to make an initial investment of \$2555 for audio and video training tapes.

Training Program Boilerplate

SOURCE NAME	TRAINING TOPIC	FORMAT	TIME REQUIRED/ ALLOWED	PRICE
NCIT	Installer	Self-study	2 years	\$240
SCIE	"Confident Climbing I & II"	Videotape	60 minutes	\$150
SCIE	"Coaxial Cable Basics"	Videotape	30 minutes	\$75
SCIE	"Safety Awareness"	Videotape	30 minutes	\$75
SCIE	"Diagnosing Common Cable Faults"	Videotape	30 minutes	\$75
SCIE	"Cable Handling & Installation"	Videotape	30 minutes	\$75
Gilbert	"Connectors"	Videotape	30 minutes	\$50
Local	CPR	Seminar	2 days	\$75
ICS	Technical Mathematics	Self-study	1 1/2 yrs	\$330
Pryor Resources	Customer Relations	Audiotapes	6 days	\$90
American Media	"Take Care" (Customer Relations)	Videotape	45 minutes	\$500
MRI	Specialized Communications Electronics	Self-study	2 years	\$835
SCIE	"dB and dBm"	Videotape	30 minutes	\$75
SCIE	"SLM Basics"	Videotape	30 minutes	\$75
SCIE	"SLM: Errors & Accuracy"	Videotape	30 minutes	\$75
NCIT	Technician	Self-study	2 years	\$500
SCIE	"MISC Video Test Signals I & II"	Videotape	60 minutes	\$150
Magnavox	Mobile Technical Training Seminar	Workshop	3 days	\$300
SCIE	"Video Waveform Measurements"	Videotape	30 minutes	\$75
SCIE	"Overhead Lines & Backfeed"	Videotape	30 minutes	\$75
ANA	Writing for Success	Self-study	6 months	\$95
Resource, Inc.	"Bucket Rescue"	Videotape	30 minutes	\$110
NCIT	Chief Technician	Self-study	2 years	\$610
Hughes Microwave	Microwave Basics	Workshop	5 days	\$0
SCIE	"RF Sweep Generator Applications"	Videotape	30 minutes	\$75
Pryor Resources	Basic Supervision I & II	Audiotape	2 weeks	\$180
Datapro	Data Communications I	Seminar	3 days	\$695
Jerrold	Special Technical Session	Workshop	4 days	\$295
IEEE	Management Program	Self-study	1 year	\$400
Datapro	Data Communications II	Seminar	3 days	\$695
SCIE	NCI/E Certification	Self-study	2 years	\$50
ANA	Time Management	Self-Study	6 months	\$95
American Media	"Time Trap"	Videotape	45 minutes	\$500
Cleveland Inst.	AAS in Electronics Engineering Technol.	Self-study	4 years	\$3,000
SCIE	"Developing a Preventive Mainten. Prog"	Videotape	30 minutes	\$75
UCLA	The Technical Mgr in a Dynamic Envir	Seminar	3 days	\$875
				\$11,645

Figure 3. Training Program Boilerplate

This investment divided over the same time frame comes to \$141 per year for the purchase of training tapes, and \$141 divided by the number of technical trainees most likely will not be over \$30 annually. This raises the annual amount of training dollars spent per student to approximately \$535. The cost difference, then, between a very basic training program and a more thorough program is minimal, but the difference in the results could be significant. The company now has a permanent training library available both to new employees and students for first time viewing or listening as well as experienced employees for reviewing and retraining purposes.

The flexibility and value of the eclectic approach to address a system's wide variety and changing training requirements by general or technical managers is obvious in these limited examples. It is beyond the scope of the intent of presenting the training matrix and full training listing to dramatize further specific application examples. It is up to interested systems to determine for themselves the best approaches and combinations of the resources listed and categorized here for their own best general or specific training programs.

CONCLUSION

The days of the midas touch for the cable industry have since passed and as CATV technology becomes increasingly complex, cable systems must pay closer attention to the training function as a bridge between cost-effective operations and long-term quality of service. Using an eclectic approach to develop a training program may prove to be the most cost-effective method for the company as well as most beneficial, flexible, and productive for the technical trainee. With the help of the training matrix and thorough listing of training resources, companies should easily be able to piece together their own basic training program to meet their specific needs and desired results.

TRAINING RESOURCES

Ann Alvis Training, Inc.
1701 1st Ave W
Bradenton, FL 33505
813-748-3809

Ann Alvis provides in-house training in customer service, customer relations, communication skills, direct sales, management relations, etc. Ann presents activity-oriented three hour training sessions individually developed and designed specifically to fulfill the needs of the participants to produce the desired results. Fees include an \$85 hourly rate during actual training as well as expenses.

American Institute
Carnegie Building
55 Main Street
Madison, NJ 07940
212-377-7400

The American Institute offers computer-oriented, regional two to four day seminars. Course titles include, "Writing & Using Macros for Lotus 123," "Project Management on the Personal Computer," "Data Communications: An Intensive Introduction," and "Hands-on Troubleshooting Data Communications Systems & Networks." Tuition fees range from \$595 to \$895. CEU's are awarded.

American Management Association
Extension Institute
135 West 50th Street
New York, NY 10020
212-903-8040

AMA Extension Institute offers 87 independent study courses in five general categories including General Management Skills (time management, technical writing, basic supervision, etc.), Management and the Computer, Marketing Management, Manufacturing Management, Service Organization Management, and Managerial Finance and Control. AMA-EI allows these courses to be taken individually or in a combined program resulting in a Certificate in Business Management. Courses are self-regulated; correspondence tests are included. Non-member price per course is \$94.95.

American Media
1454 30th Street
West Des Moines, IO 50265
800-262-2557

American Media offers for purchase a wide variety of management, customer

service, and safety training videotapes. The cost for each tape averages \$500.

Arthur Andersen & Co.
Educational Services
1405 North Fifth Ave.
St. Charles, IL 60174
800-874-4449

Regional one to four day seminars cover many aspects of management. General management courses include general supervision, business writing, time management, project management, etc. Seminar tuition ranges from \$175 to \$600. In-house, customized training programs are also available.

ATC National Training Center
2100 South Hudson
Denver, CO 80222
303-753-9711

On-site training provided by ATC training staff. Courses include Installer, Technician I, and Technician II. Prerequisite training from Cleveland Institute of Electronics is necessary for both technician courses. Excluding time involved for correspondence CIE work, each on-site class runs about 10 days. Tuition is approximately \$1000 per course; transportation, room and board, and prerequisite courses not included.

Aubrey Daniels & Associates
3531 Habersham at Northlake
Tucker, GA 30084
404-493-5089

Regional one day human relations seminars including "How to Talk to People," and "How to Work with People in a Positive Way." Seminar fees range from \$195 to \$210.

Bergwall Training Systems, Inc.
106 Lindbergh Blvd
Uniondale, NY 11553
800-645-3565
516-222-1111

BTS offers a variety of standard courses for use as in-house training. Courses can also be used as self-regulated independent study. Course topics include business writing, basic accounting, BASIC programming, fleet maintenance, drafting, CAD, basic electricity, basic electronics, digital electronics, etc. BTS also provides custom designed training programs.

Blonder-Tongue Laboratories
One Jake Brown Road
Old Bridge, NJ 08857
201-679-4000

BT offers a two day regional seminar on MATV, CATV, and SMATV technologies for \$125 per person. Interested parties should contact local offices for scheduled seminars in those areas.

C-Cor Electronics Inc.
60 Decibel Road
State College, PA 16801
814-238-2461

C-Cor holds several regional three day technical seminars for CATV Technicians throughout the year. Seminars cover system basics, adjustment of amplifier levels, system performance, system upgrade and problems, along with specific, hands-on C-Cor equipment training. Seminar registration is \$100.

CATV Technical Seminars
PO Box 9893
Alexandria, VA 22304
703-823-6522

The three day regional seminar offers CATV technical basics including cable transmission systems, equipment, distortions, amplifier technology, microwave applications, satellite technology, system design, maintenance and operation etc. Advance registration fees are \$450.

Center for Advanced Professional Education
1820 E. Garry Street, Suite 110
Santa Ana, CA 92705
714-261-0240

Two to three day seminars focus on data communications. Seminars are offered regionally for \$645 to \$695. CEU's are awarded.

Center for Creative Leadership
5000 Laurinda Drive
PO Box P-1
Greensboro, NC 27402-1660
919-288-7210

The Center for Creative Leadership provides free literature and information on leadership and management skills and improvement techniques. Also available without charge is a subscription to Issues & Observations by contacting the center.

Chillicothe Area Vocational Technical School
1200 Fair Street
Chillicothe, MO 64601
816-646-3414

The school offers a two year Electronics Technician program (1080 hours). The day-time only program includes theory,

troubleshooting, circuits, etc. Tuition for the first year is \$1000 and \$2000 for the second year.

Cleveland Institute of Electronics
1776 East 17th Street
Cleveland, OH 44114
216-781-9400

CIE offers independent, self-study electronics training including FCC License, Electronics Technology, Electronics Engineering, Electronics Engineering and Advanced Troubleshooting, as well as a comprehensive Associate in Applied Science in Electronics Engineering Technology program.

Dakota County Area Vocation Technical Institute
145th Street & Akron Road
PO Drawer K
Rosemount, MN 55068

The school offers a 20 month CATV Technician program focusing on test equipment, amplifier technology, basic construction, antenna theory, etc. Tuition assessed per day. All courses offered during the day.

Dartnell
4660 Ravenswood Ave.
Chicago, IL 60640
312-561-4000

Dartnell sells or rents management, sales and customer service video training aids. Each training videotape or film is 20 to 30 minutes. Rental fees are \$140 and purchase prices range from \$400 to \$700.

Data-Tech Institute
Lakeview Plaza
PO Box 2429
Clifton, NJ 07015
201-478-5400

Data-Tech offers regional one to three day seminars focusing on data communications and software specific programs. Course titles include "Data Communications: A Complete Overview," and "Advanced Application Techniques: Using Lotus 123 Macros and Functions." Some courses are available as in-house programs and can also be customized for specific needs. Tuition fees range from \$395 to \$795.

DataCommunications
Special Projects Conference Management Center
c/o Information>Breakthroughs, Inc.
445 West Main Street
Wyckoff, NJ 07481
201-891-8405

Regional two to five day seminars focusing on data communications are offered from \$595 to \$1400. Course titles include "Comprehensive Course in Data Communications," "X.25 and Packet-Switched Networks," "Integrated Data & Voice Networks/ISDN," etc.

Datapro Research Corp.
1805 Underwood Blvd.
Delran, NJ 08075
800-257-9406

Regional two to three day seminars are offered on data communications and telecommunications. Titles include Data Communications I & II, Transmission Technologies, Data Network Design & Performance, Telecommunications I & II, etc. Tuition fees range from \$695 to \$795. Catalog available by writing.

Digital Equipment Corp.
Educational Services
Seminar Programs BU0/E58
12 Crosby Drive
Bedford, MA 01730
617-276-4949

Digital offers regional one to four day computer training sessions on their own equipment and software. Tuition ranges from \$250 to \$900.

DSI Micro, Inc.
770 Broadway
New York, NY 10003
212-475-3900

DSI Micro offers self-study training packets on management skills, basic computer operation as well as more advanced computer operations. The computer-based training kits include training diskettes and guides; some include video training tapes as well. Prices of kits range from \$39.95 to \$450. Catalog available by writing.

Dun & Bradstreet Business Education Services
PO Box 803
Church Street Station
New York, NY 10008
212-312-6880

A one day seminar on the basics of supervision is offered regionally for \$125. CEU's are awarded.

Eagle Seminars
2612 Croddy Way
Santa Ana, CA 92704
714-777-3488

Eagle offers a regional one day professional audiovisual production seminar from slides and multi-image to video to new technologies such as interactive

videodisc and videoconferencing. Seminar tuition is \$165. CEU's are awarded.

East Bay Skills Center
1100 67th Street
Oakland, CA 94608
415-658-7356

The center offers two CATV technically-oriented training programs. The six-month program focuses primarily on installer functions including installation, splicing, basic construction, pole climbing and troubleshooting. The nine-month program covers the same material as well as design, antenna theory, testing and measurements, etc. Courses are offered during the day with no tuition cost to the student.

Enterainment
PO Box 7240
Portland, ME 04112
207-774-3307

Enterainment offers in-house customer service and human relations training. Topics covered include the current basic and pay schedules, handling irate customers, telephone etiquette, and self-esteem in relation to job satisfaction. Sessions are one day and cost \$125 per person as well as expenses for the trainer, Steve Broydrick. Steve also conducts a pre-training on-site visit to determine specific areas of need and develops training agendas to fit those areas. Minimum attendance is 16.

Essex County College
303 University Avenue
Newark, NJ 07102
201-877-3274

The college offers a two-year associate degree program in broadcast technology and operations. Courses are offered during the day at \$34.00 per credit hour.

General Services Administration
National Archives and Records Service
National Audiovisual Center
Washington, DC 20409
800-638-1300

A large collection of audio/visual training aids is available through the General Services Administration in several formats including 2 x 2 slides with audiocassette, 16mm films and videotape. Subjects range from agriculture to surgery. In the electronics category, 184 A/V programs are available, and many more in safety. All aids are available to rent or purchase at a relatively low cost; a 70 minute videotape can be purchased for \$160. Catalog available by writing.

George Washington University
Continuing Engineering Education Program
Washington, DC 20052
800-424-9773
202-676-6106

GWU offers three to five day engineering courses on a wide variety of subjects such as data compression techniques, frequency hopping signals and systems and many more. All courses are held at the university. Room and board are not provided on campus. Tuition costs range from \$515 to \$920. Catalog available by calling or writing.

Gilbert Engineering
5310 West Camelback Road
Glendale, AZ 85310
800-528-5567
602-245-1050

Gilbert offers both technical seminars and training videotapes. The tapes focus on proper installation and application of their whole line of connectors. Videotape purchase prices range from \$25 to \$60.

Haimes Associates, Inc.
708 South Washington Square
Philadelphia, PA 19106
215-922-1617

Haimes offers regional two-day EEO seminars titled, "EEO: What You Need to Know" covering legal requirements, discrimination, and litigation. Tuition is \$725. Haimes also has available for purchase a 50 minute EEO video training tape for \$750. The tape can be previewed for five days for \$65.

Harvard Business Review
Reprint Service
Soldiers Field
Boston, MA 02163
617-495-6192

HBR offers reprints of published individual management articles for a minimal fee, \$1.00 per reprint. Other services offered include the reprinting and binding of custom selected groups of articles for in-house training purposes. In addition, HBR offers an on-line database service with more than 7000 HBR articles, indexed and abstracted for easy reference.

Heath Company
Heathkit
Benton Harbor, MI 49022
800-253-0570
616-982-3411

Heathkit offers electronic devices in kit form with assembly required such as oscilloscopes, frequency counters,

multimeters, spectrum analyzers, noise generators and many more that can be used in conjunction with electronics training programs. In addition, Heathkit offers correspondence amateur radio courses including Novice, General License, and Advanced Class Radio License courses, all under \$60. CEU's are awarded for completion of the General License and Advanced courses. The Heathkit catalog is available on-line through CompuServe by typing GO HTH at any "!" or "OK" prompt.

Henkels & McCoy
Jolly Road
Blue Bell, PA 19422
215-283-7600

Henkels & McCoy offers CATV technical training courses both as in-house programs or through state agencies on a rotational basis. The courses offered are CATV Installer, CATV Installer Technician, and CATV Draftsman/Strand Mapper. Sources for these courses rely heavily on NCTI information. Schedules of government-funded courses are available from H&M by calling Jerry King, Western Training Manager, at 618-252-5311, or Evan Baker, Eastern Training Manager, at 215-283-7829. In-house training programs can be customized for specific needs and draw from 42 separate H&M categories at an average cost of \$1500 for a five day program. Prices varies depending on class size and program.

Hewlett Packard
W-120 Century Road
Paramus, NJ
201-265-6800
Or Nearest Sales Office

HP offers many product-specific courses throughout the North American continent at their 42 training centers. For detailed course descriptions, write for the HP Customer Education, Consulting, and Implementation Services Planning Guide, the North American Customer Training Schedule for Computer and Instrument Products, and the North American Instrument Training Catalog. Tuition fees range from \$125 to \$2950 and courses run from one to five days.

Hughes Microwave Communications Products
PO Box 2999
Torrance, CA 90509
213-517-5276

Hughes offers 4 1/2 day seminars on product-specific microwave equipment and procedures, channel configuration, and troubleshooting. The seminar is available at no charge to the participants. All seminars are conducted in Torrance,

CA. Daily lunches and one evening meal are provided.

ICS-Intext
Continuing Education Division
Oak and Pawnee Streets
Scranton, PA 18515
717-342-7701

ICS offers correspondence self-study training on a wide-variety of subjects with special emphasis on math, and electricity and electronics. ICS offers pre-arranged courses, but will customize any group of lessons into new courses. Videotapes and training aids (e.g. electrical experiment kits) are also available. The cost of a course depends on the number of lessons, each lesson costing \$23.

IEEE Service Center
445 Hoes Lane
Piscataway, NJ 08854-4150
201-981-0060

IEEE offers individual learning packages on digital signal processing, spread spectrum signal and systems and advanced microprocessors. Each package includes a textbook, study guide, and audio-cassette. In addition, some packages include optional experiments, workbooks, and floppy diskettes. Non-member prices range from \$62.95 to \$325. IEEE also offers a self-study management program in five sections including team building, project management, business writing, basic supervision, and building memory skills, each of which can be purchased separately for \$99.95 or as a five-group program for \$399.80. CEU's are awarded.

Information Gatekeepers Inc.
214 Harvard Ave.
Boston, MA 02134
617-232-3111

Information Gatekeepers sponsors seminars, expositions, and reference materials on fiber optics. Seminars include measurement and testing of fiber optics, system designs, digital switching, etc. Fees range from \$445 to \$695. Seminars are generally held in the Boston vicinity and are from one to two days.

Institute for Advanced Technology
Control Data Business Advisors
6003 Executive Blvd.
Rockville, MD 20852
800-638-6590

Over 80 regional seminars are offered in the area of data communications, database management, software engineering,

personal computers, management/supervisory development, marketing and sales, etc. Fees range from \$195 to \$995 and are from one to five days. Also available are management training video-cassettes for \$95 and personal computer videocassettes for \$195 and \$295.

The Institute for Professional Education
1515 North Court House Road, Suite 303
Arlington, VA 22201
703-527-8700

IPE offers regional two to five day seminars in statistics, management, simulation and modeling, personal computers and computer science. Tuition fees range from \$710 to \$1250. In-house and customized programs are also available.

Interference Control Technologies
Don White Consultants Inc, Subsidiary
State Route 625, PO Box D
Gainesville, VA 22065
703-347-0030

A three-day regional seminar on grounding and shielding with an optional fourth day workshop using CAD is offered for \$815 plus \$235 for the workshop. CEU's are awarded.

Jerrold Division
General Instrument Corp.
2200 Byberry Road
Hatboro, PA 19040
800-523-6678

Jerrold offers a four day "hands-on" CATV technical seminar covering the fundamentals of cable, headends, system design-trunk and feeder, operation and maintenance, pay systems, and computer controlled systems, PPV systems, stereo systems, status monitoring systems, proof of performance, and sweep. Tuition is \$295.

Knowledge Industry Publications, Inc.
701 Westchester Ave.
White Plains, NY 10604
800-431-1880
914-328-9157

Knowledge Industry offers regional video-oriented seminars including using and maintaining video equipment, editing techniques, directing, camera operations, field production, managing a video staff, etc. Seminars range from one-half to two days and cost \$140 to \$465. Also available is a four day production workshop for \$850. A catalog of reference materials is available as well.

Learning Dynamics Institute, Inc.
PO Box 323

Needham, MA 02192
800-225-1558

LDI offers a one day seminar on listening and memory skills. Participants receive a workbook and audiocassette on communicating clearly. Seminar tuition is \$185 with special discount rates for group attendance. The seminar is also available for in-house presentation.

Magnavox CATV Systems, Inc
100 Fairgrounds Dr.
Manlius, NY 13104
315-682-9105

Magnavox offers a three part "hands-on" CATV technical course including basic theory, practical application, and hands-on training. Magnavox uses its unique mobile technical training van in conjunction with a standard classroom format. Tuition is \$300 for the three day seminar.

McGraw-Hill Training Systems
PO Box 641
Del Mar, CA 92014
619-453-5000

The MGH Supervision Series offers a ready-made in-house supervisory training program in four training modules including fundamental skill building, interpersonal skill building, functional skill building and management orientation. Each segment of the module provides a trainer's guide, participant workbooks, videocassette and audio-cassettes. The complete supervision series including all segments of all modules costs \$11,992.50. Each segment can be purchased separately, discounts applying to quantity purchases.

Mercer County Community College
1200 Old Trenton Road
Trenton, NJ 08690
609-586-4800

Mercer College offers an Associate Degree Program in Telecommunications Technology including courses in radio, television, CATV technology, satellite and microwave technology, broadcast and cable design, and radio, television, and CATV engineering. Tuition is \$26 per credit hour. Financial assistance is available.

Middlesex Community College
100 Training Hill Road
Middleton, CT 06457
203-344-3052

Middlesex College offers an Associate Degree program in Cable Telecommunications. The two year program focuses on

CATV technical practices, video production, graphics, duplication, etc.

National Cable Television Institute
PO Box 27277
Denver, CO 80277
303-761-8554

NCTI offers correspondence, self-study CATV training programs including Installer, Technician, Chief Technician, System Tech I & II, Advanced Technician, Master Technician, and TV Production. Each lesson is followed with an exam, and successful completion of a final exam is now required before certification. Tuition ranges from \$115 to \$760 with discounts applied to repeat students. Students also receive at no charge Cable Tech, an NCTI publication.

New York University
School of Continuing Education
PO Box 1206
Stuyvesant Station
New York, NY 10009
212-598-7064

NYU offers a certificate program in Video Management and Technology through the successful completion of six courses including The Video Marketplace, A Guide to the Electronic Media, and any four of six elective courses. Courses run from four to ten sessions and cost \$230 or \$275. Also available through Continuing Education are two day seminars on CAD and drafting, AUTO-CAD, and selecting and evaluation CAD systems for \$450.

North Texas State University
Professional Development Institute
PO Box 13288, NTSU
Denton, TX 76203-3288
817-565-2483

PDI offers a variety of seminars including project management, basic supervision, sales, personal computer basics, Lotus 123 and DBase II & III, business writing, time management, etc. Tuition ranges from \$495 to \$1190. Sessions are from one to four days. Also available are audiocassette management training programs as well as in-house programs.

NRI School of Electronics
3939 Wisconsin Ave., NW
Washington, DC 20016
202-244-1600

NRI's correspondence study curriculum includes 16 courses with emphasis in electronics and communications. Titles include "Basic Electronics," "Electronic Technology," "Communications Electronics," "Data Communications," etc. Tuition ranges from \$470 to \$2435. Financing is available.

Omega School of Communications
548 N. Lake Shore Drive
Chicago, IL 60611
312-321-9400

The Omega School offers a 10 week FCC License Program, an Installer Program and a Cable Television Technology Program. All courses are offered during the day, evenings and Saturdays. Contact Pat Ehrhart for registration information.

Padgett-Thompson
Padgett-Thompson Building
PO Box 8297
Overland Park, KS 66208
800-255-4141

A one-day leadership seminar is offered regionally for \$98.

Phillips Publishing, Inc.
2811 Montrose Road
Potomac, MD 20854
301-340-2100

PPI offers two day regional data and telecommunications seminars geared toward the non-technical manager. Titles include "Fiber Optics Technology for the Non-Technical Manager," and "Satellite Technology for the Non-Technology Manager." Tuition is \$595. In-house programs are also available.

Pryor Resources, Inc.
Audio Cassette Education Division
2000 Johnson Drive
PO Box 2951
Shawnee Mission, KS 66201
800-255-6139

Pryor Resources offers audiocassette management training programs including basic supervision, customer relations, management skills for the technical manager, etc. Six tape programs cost \$90.

Resource, Inc.
14007 North Dale Mabry
PO Box 271570
Tampa, FL 33688
813-961-4290

Resource offers a library of audiovisual training materials for self or in-house study. Materials can be rented or purchased. Related subjects include safety and customer relations. Individual videocassettes cost \$110 to \$400.

Sheldon Satin Associates, Inc.
135 William Street
New York, NY 10038
212-267-3560

Satin Associates provide customized

training programs for in-house presentations focusing on customer service and relations. Prices vary according to the number of in-house trainers and participants.

Society of Cable Television Engineers, Inc
PO Box 2389
Westchester, PA 19380
215-363-6888

SCTE sponsors the BCT/E Certification Program designed specifically for CATV Technicians and Engineers. Participants are tested in seven areas including Signal Processing Centers, Video and Audio Signals and Systems, Transportation Systems, Distribution Systems, Data Networking and Architecture, Terminal Devices, and Management, Professionalism and Ethics, and must satisfy specified requirements in addition to successful exam completion. SCTE also offers numerous CATV training aids including publications and manuals, and videotapes.

Software Institute of America, Inc.
8 Windsor St.
Andover, MA 01810
617-470-3880

SIA sponsors data communications, regional, two to four day seminars. Tuition ranges from \$395 to \$795.

South Oklahoma City Junior College
7777 S. May Ave.
Oklahoma City, OK 73159
405-682-1611

The SOJC Communications Department offers an Associate Degree program in Electronic Technology. Two elective courses in CATV electronics can be incorporated into the program.

Southern Methodist University
Edwin L. Cox School of Business
Management Center
Dallas, TX 75275
214-692-3255

SMU offers a two day seminar in various Texas locations on Statistical Quality Control. Course fee is \$495.

Stat-a-Matrix Institute
2124 Oak Tree Road
Edison, NJ 08820
201-548-0600

Stat-a-matrix offers two to five day regional seminars focusing on statistics, quality assurance and engineering, and reliability. Tuition fees range from \$695 to \$1095.

Teleometrics International
1755 Woodstead Court
The Woodlands, TX 77380
800-527-0406

Teleometrics provides a training program titled "People Skills for Middle Managers" to be presented as an in-house program. Public presentations are available to review the program.

Telestrategies
1355 Beverly Road
McLean, VA 22101
703-734-7050

Telestrategies offers regional two to three day telecommunications seminars. Topics include basic technologies and system concepts in the Local Exchange System, specialized common carrier networks, CATV, communications satellite systems and data communications products and services. Tuition ranges from \$795 to \$1095.

UCLA Extension
PO Box 24901, Dept. K
Los Angeles, CA 90024
213-825-1047

UCLA offers an entire series of Engineering Short Courses in the areas of Aerospace, Applied Mathematics, Chemical, Civil, Computer Science, Electrical and Electronics Engineering, Engineering Management, and others. Electrical/Electronics course titles include "Modern Data Transmission," "Modern Microwave Measurements and Applications," "Optical Interference Coating Technology," "Program and Project Management: Principles and Practice," "The Technical Manager in a Dynamic Environment," and more. Courses are offered at or near the UCLA campus and are from four to five days. Tuition ranges from \$795 to \$975. CEU's are awarded.

University College
University of Cincinnati
ML 47
Cincinnati, OH 45221
513-475-3551

The University offers a two year Asso-

ciate Degree program emphasizing cable management but with some focus on lab technician and distribution technician functions. Courses are available during the day and tuition is \$637 per quarter for Ohio residents.

The University of Michigan
School of Business Administration
Executive Education Center
Ann Arbor, MI 48109-1234
313-763-1000

The University offers various management programs in accounting, corporate strategy, general management, labor relations, marketing, personnel, training, etc. All sessions are held on campus and are from three to five days. Tuition fees range from \$970 to \$2200 and include tuition, books, instructional materials, living accommodations, and all meals.

Wadena Area Vocational Technical Institute
PO Box 267
405 SW Colfax Ave.
Wadena, MN 56482
218-631-3530

WAVTI offers a 20 month Cable Television Technology program focusing on basic electronics and CATV installations the first year, and construction, test equipment, headends, antenna theory, satellite earth stations, etc. the second year. Tuition for Minnesota residents is \$1100 for the first 9 months and \$1347 for the next 11 months. Out-of-state tuition is approximately twice the in-state tuition.

Wisconsin Indianhead Technical Institute
Rice Lake Campus
1900 College Drive
Rice Lake, WI 54868
715-234-7082

WITI offers a 9 month CATV technical program including CATV electrical principles, field techniques, mapping, and mathematics. Tuition is \$21.75 per credit hour or approximately \$1200 for the complete program.