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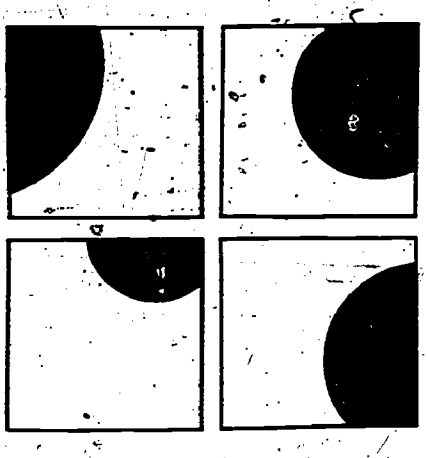
ABSTRACT

Articles in this collection are concerned with (1) broadcast radio and television and how these media change people's living and learning styles; (2) instructional uses of telecommunications; (3) interconnections of several kinds including satellites, teleconferencing, and cabled campuses; and (4) "how to do it" dealing with both the uses for various kinds of hardware, and the processes to support instruction. Most of the readings have been published previously in "Audiovisual Instruction" or its supplement, "Instructional Resources." However, some articles submitted for the January 1978 issue of AVI, which did not appear because of space limitations, are included. A bibliography on videodisc is included in the first section. (Author/JEG)

# LEARNING VIA TELECOMMUNICATIONS

## Readings from *Audiovisual Instruction*—3







Association for Educational Communications and Technology
Washington, D.C. 1978

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# FOREWORD

The most important influence on the growth of communications media and technology in the last few years has been telecommunications. The focal position of telecommunications in the educational technology movement can be attributed to at least two major factors: its constantly increasing *sophistication* as a means of delivering information and its *pervasiveness* in American society and throughout the world.

The sophistication of telecommunications is readily apparent in such phenomena as remote, timed video recordings made possible by video cassette machines; computer controlled display and distribution systems such as PLATO and TICCIT; and space satellites used to relay information accurately and reliably to all parts of the world.

A casual look at summary statistics impresses one with the pervasiveness of television, radio, and other devices and techniques that the term *telecommunications* subsumes. In 1977, at least half a million home video cassette recorders were marketed in the United States. There were 720 commercial and 269 educational television stations broadcasting to 73,000,000 homes equipped to receive television signals. That figure means that 98 percent of American homes have at least one TV set. Further, 46 percent have two sets and 78 percent have color TV reception. Figures for radio reception in the home are even higher. In the schools, about two-thirds of the classrooms can receive television signals and about the same proportion of teachers use educational television in the classroom regularly.

The subject of this book of readings, telecommunications, is so broad and multifaceted that we have had a great deal of trouble arriving at a title. We're not entirely satisfied with the name, but *Learning Via Telecommunications* is the most expressive title we could devise. The reader must recognize that *telecommunications* embraces not only the technological products that enhance human communication (TV, radio, computers, cable, satellite, telephone, etc.), but also the techniques and human adaptations to these marvels. Since *Audiovisual Instruction* is concerned with learning and, more precisely, instruction, it's an easy step to arrive at *Learning Via Telecommunications.*

The book has four sections. The first has to do with broadcast radio and television and how these media change the way people live and the way they learn. The section concludes with a bibliography on videodisc, an emerging technology that may affect our uses of television in fundamental ways. The second section is concerned directly with instructional uses of telecommunications. Section three deals with interconnections of several different kinds, including satellites, teleconferencing, and cabled campuses. Section four contains practical "how-to-do-it" articles dealing with both the uses for various kinds of hardware and the processes to support instruction.

Most of the readings in this book were published previously in *Audiovisual Instruction* or its supplement, *Instructional Resources.* However, some of the articles published in this book were submitted for publication in the January 1978 issue of AVI (which had "telecommunications" as its theme), but were not included at that time because of space limitations.

A great deal of the credit for the production of these readings is due Dr. Richard Bell, past president of the Division of Telecommunications of AECT, Dr. Paul Welliver, Pennsylvania State University, and Dr. Charles Woodliff, Western Michigan University, all of whom served as readers for the January 1978 issue of AVI and judged the newly included manuscripts for us. In addition, several persons on the AECT staff made significant contributions to this book—among them, Richard Nibeck, Charles Van Horn, Michele Brace, and Marilyn Coughlin. The editorial production of the book was conducted by former staff member Vita Pariente and her "Blue Pencil Group" associates, particularly Barbara Adams.

Those of us involved in developing this book of readings found the resulting product to be unexpectedly stimulating and thought provoking. We hope all who read it will find it equally rewarding.

*—Howard Hitchens, Editor*

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SECTION IV: HOW-TO-DO-IT TECHNIQUES AND PROCESSES

# 1

# RADIO AND TELEVISION PROGRAMS

## Using Broadcast Programs for Instruction

# THE PARENT PARTICIPATION TV WORKSHOP

GLORIA KIRSHNER

What difference does it make if parents watch television with their children?

Ask some of the students who participated in the pilot Parent Participation TV Workshop.

"The TV parties were very helpful to myself and my mother," Susan Settembrino of Cathedral High School in New York City wrote of Cathedral's Parent Participation TV Workshops. "They brought us closer because now we aren't afraid to talk to each other. We discuss a lot now because we feel that is important."

"It helped adults to share their feelings with young people. It also helped because it gave teenagers a chance to express the way they look at things," Isabel reported.

These students and their parents participated in the pilot Parent Participation TV Workshops, sponsored by *Teachers' Guides to Television*. The workshops were conducted in three widely separated school systems in Americus, Georgia; Charlottesville, Virginia; and New York City's parochial schools.

Parents came to school to watch a television broadcast with their children. Teachers demonstrated for parents how to use television at home to open communications with their children. Teachers also served as moderators for the cross-generation discussions that followed viewing of the broadcasts.

We chose the NBC *Special Treats* series for our pilot project. The series began in October with *Luke Was There*, the story of a young boy in a big city who finds himself in a children's home when his mother is suddenly taken ill. We continued in November with *Big Henry and the Polka Dot Kid*, the story of a ten-year old orphan boy who goes to live with his stern, frugal uncle in the North Woods. In December, there was *Little Women*, and in February, *A Little Bit Different*—the story of a young sports hero forced to face the loss of his leg when he develops cancer.

## New York City

At Cathedral High School in New York, only two adults came to the "TV Party" in October. But the junior and senior high school girls saw the workshops as a way to educate their parents and went to work making posters, organizing a phone campaign, sending written invitations, holding a prize drawing, and arranging a tour of the NBC studios. In November, 40 adults said they would participate!

Sister Dorothy Farley, Director of Cathedral Television, was responsible for the workshops. The Cathedral television production class videotaped the workshop, and saw portions of the tape used at an NBC press conference. When the November workshop was taped, the girls had to send for emergency microphones to cover the crowd! Some mothers brought younger children; fathers responded to the invitation; and one student, whose mother was divorced, asked her pastor to attend (and he did). Fordham University's Department of Education also joined in the project.

After viewing *Big Henry and the Polka Dot Kid*, the ensuing discussion of discipline problems among parents and children touched on topics ranging from teenagers popping bubble gum to a 12-year-old's demand to see an X-rated movie.

## Charlottesville, Virginia

In Virginia, Superintendent of Schools William Ellena set up the workshops for fourth and fifth graders in a Charlottesville school and their parents. Charlottesville teachers met first with the children, then with the parents, and then brought the two groups together to watch the TV shows. They used the programs and follow-up discussions to help parents understand the techniques of teaching decision-making and of asking open-ended questions.

Parents unanimously felt the workshops would help their home relationships with their children. Parents of the fourth and fifth graders were astonished at the perception displayed by their children in viewing the television shows. They had no idea that children absorbed as much as they did from a TV show.

As Superintendent Ellena says, "Parents grow to realize that selected TV programs present a tremendous opportunity to increase communication between different age levels. TV can be utilized as an entree to discussion of *issues, values, ethics,* and other topics that might be difficult to bring up unless there was some reason to do so."

The Charlottesville schools are planning to continue and expand the Parent Participation TV Workshops on a district-wide basis.

## Americus, Georgia

In Georgia, Buford Reese, principal of Central Junior High School, led junior high school students and their parents in discussions following viewings of the TV programs. The discussions shed insights into both the problems parents have with children and the problems children have with parents. The workshops proved a good catalyst for parent-student communications and helped to strengthen the school-parent communication link as well.

Georgia is planning to expand its workshops, too. Central Junior High has invited its sister school, Staley, to participate, as well as observers from Georgia Southeastern

College and Albany State College to help in the training of teachers.

### Using TV for Parent-Child Communication

TV as the catalyst for parent involvement and home-school cooperation offers three unique advantages that many other approaches to parent involvement are unable to offer.

1) It encourages and permits the active involvement of parents of children of all ages; not just parents of young children.
2) It requires no expenditure of *additional* time on the part of the parent. (Nielsen statistics show that the average American family spends 6 hours daily watching TV.)
3) It allows the parent to feel comfortable and secure at once because the medium and the materials are familiar; and have been in constant use in the home.

The lack of parental involvement, the alienation of the young, the silent dinner table, the generation gap, can all be bridged in an easy moment by parents who simply sit down beside their children watching a TV program, and then open discussion with them afterwards.

TV, we discovered, can open channels of communication between parents and children who never knew, or have long since forgotten, how to talk to each other—and give them something to talk about. With some beginning help from teachers, most parents can learn to use television broadcasts to help children develop moral judgment, learn the techniques of decision-making, choose their values, and build their self-image.

*Teachers Guides to Television* is planning to expand the Parent Participation TV Workshops, working with a great many television series, school districts, and the professional educational groups. Those who have joined in the effort to explore this new approach to education are:

National Council of Teachers of English
American Association of School Administrators
Association for Supervision and Curriculum Department
National Association of Elementary Schools Principals
National Association of Secondary School Principals
National Council for the Social Studies
American Association of Colleges for Teacher Education
American Federation of Teachers
Association for Educational Communications and Technology
National School Public Relations Association
American Library Association
National PTA

Perhaps the most cogent reasons for pursuing these efforts were expressed in a letter from President Jimmy Carter. He wrote, during his first week in office:

"I am delighted to hear of the success of the Parent Participation TV Workshops which had its beginnings in Georgia.

"Our children are our future—the only future we have. Television has opened up to them new and unprecedented opportunities for expanding their educational horizons. And it is most encouraging that parents are taking such an active part in guiding their children to the best possible use of this very effective medium."

# SIMULTANEOUS TV AND RADIO BROADCASTS TEACH CHILDREN IN THEIR HOMES

LISSA REIDEL

*A school district research team in Philadelphia has found a new way to teach vocabulary to children watching television in their homes. The system, which makes use of simultaneous television and radio broadcasts, is described below.*

In Philadelphia, a school district research team has found a new way to teach vocabulary to thousands of kids watching TV at home. It's done through an ingenious combination of television and radio using popular after-school television shows. The new idea is called dual audio television, and it had its premiere season this past winter.

While the kids watch *The Flintstones* on channel 48 (Kaiser Broadcasting), they tune in to Steve on 91 FM radio (WUHY). Steve speaks only during the silences in the TV dialogue, joking, singing, and teaching new words.

At home, kids respond by giggling at Steve's jokes, answering his questions, and learning new words.

Dual audio is the result of a three-year research and development effort conducted by the Dual Audio Television Project of the School District of Philadelphia.

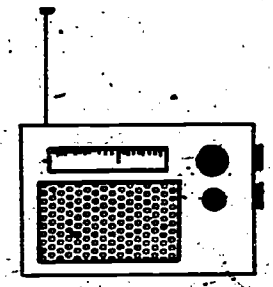
In April 1974, the first publicly-announced dual audio programs were broadcast for a two-week test. The American Research Bureau, an independent national TV rating agency, reported that some 20,500 viewers tuned in to dual audio. In the city of Philadelphia, the dual audio audience was 25 percent higher than that of *The Electric Company*, which was on TV at the same time.

Individual oral tests of the vocabulary taught on dual audio were administered to a sample of 260 children. The results demonstrated that children who listened learned the new words and concepts taught during the program.

"Because dual audio is inexpensive to produce, it has great potential as an educational mass medium," explained Dr. Terry Borton. Borton originated the idea of dual audio and directs the research project.

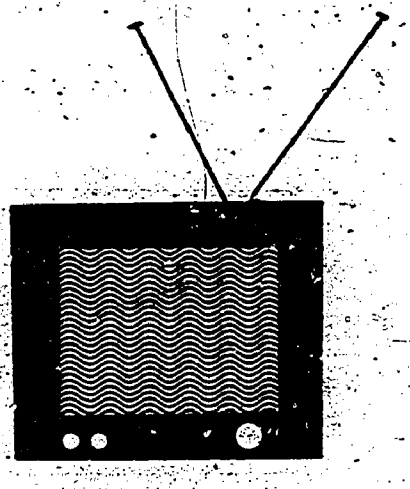
"Vocabulary is emphasized in our current broadcast, but dual audio can be used to teach a wide range of subjects to students of any age," he said.

The dual audio instructor, Stephen Baskerville ("Steve" to the kids), is an appealing personality kids love to hear. For a child listening to him, the effect is much the same as watching



TV with an older friend who is explaining what is going on. In addition to the test results, letters from children and their parents show that Steve is highly effective in reaching and teaching kids.

The production unit of dual audio, headed by Leonard Belasco, obtains the film of each TV program weeks before it is broadcast. The films are then transferred to videotape and studied to determine which words used in the show would be appropriate for building the vocabulary of elementary school students.



"The most complex part of the production process is the actual script writing," Belasco explained. "We often have to write a comment for Steve that is only ten seconds long, teaches a word or concept, and at the same time conveys a sense of warmth and personality. It takes skillful writing."

The Agency for Instructional Television has undertaken to sponsor dual audio television and is now exploring ways to offer dual audio on a national level.

# SHOULD TEACHERS WATCH TV AFTER THE FAMILY VIEWING HOUR?

NANCY L. QUISENBERRY
CHARLES B. KLASEK

Shortly after the concept of a "family viewing time" was introduced to the America viewing public, *TV Guide* released the results of a nationwide poll. The poll revealed that eight out of ten Americans favored the new rule that set aside two hours (6:00pm to 8:00pm, Central Standard Time) for television programing that would be suitable for parents to view with their children.

Ironically, that same issue of *TV Guide* (December 6, 1975) reported that ABC would drop six of its television programs, add seven new ones, and change the time slots of three. The shows dropped were *Live with Howard Cosell, When Things Were Rotten, That's My Mama, Barbary Coast, Mobile One,* and *Matt Helm.* All of these shows were included in the family viewing time except *Matt Helm.*

On Sunday, December 7, 1975, Jay Sharbutt, AP television writer, reported that all three commercial networks had cut 16 series, 15 of which were new. He noted, "the interesting thing about this season's program-whacking is that shows in the heavily-satirized, much-criticized 'family hour' accounted for most of the cancellations." A total of 12 family-viewing-time programs were dropped, 10 of them new. The casualty list was almost equally divided among the three networks.

Within a few weeks after the publication of the *TV Guide* survey and Sharbutt's article, we asked 375 fourth-, fifth-, and sixth-graders to keep television viewing diaries over a four-week period. Although the data collected were for another type of research, we could not pass up the opportunity to tabulate the viewing habits of the children in terms of lateness of viewing. We were curious to see if children curtailed their viewing after the family viewing time.

We randomly selected 174 diaries from each of the three grades and found that only four of the children stopped viewing at the close of the family viewing time, 18 viewed an hour longer, 91 viewed until news-time or 10:00pm CST, and 15 more turned off the set after the news. The startling figure, however, was that 41 children, or about 23 percent, were still viewing after 10:30pm CST, with four children remaining in front of the set at 1:00am CST (and three of these were fourth-graders).

To us, the controversies raging around the validity and legality of family viewing time, the effect of television violence on the behavior of children, and the quality and veracity of television advertising suddenly became both moot and peripheral. Regardless of which side one was on in any of the arguments, one fact clearly emerged: While the media, both print and nonprint, argued with themselves and their critics, children were watching *all* of the television programs. Everyday, they came to school having watched programs from all frequencies of the program content spectrum. What were teachers to do if they cared about their students? Many of the teachers were not even viewers of the same programs—*S.W.A.T., Bronk,* and *Starsky and Hutch* were foreign terms in their conversational vocabularies.

Some writers have attempted to assist teachers and parents by making positive suggestions. The first book, essentially for parents, was written by Evelyn Kaye in cooperation with Action for Children's Television. Its title is *The Family Guide to Children's Television* (Pantheon, 1974). *TV Guide* (September 27, 1975), in an article by Edward Morris and Freida Gregory, offered a number of games that adults and children could play together in front of the TV set. On May 1, 1976, Louise Bates Ames, in *TV Guide,* suggested "Don't Complain About TV—Use It," and gave advice to parents to begin with children at an early age to develop positive viewing habits.

Teachers received suggestions in articles such as Ann Christine Heintz's "Using What Kids Watch on TV" (*Media and Methods,* March 1976). Heintz emphasizes the use of commercial television programs in the language arts. In *Language Arts* (February 7, 1976), Harlan Hamilton reports in his article "TV Tie-Ins as a Bridge to Books" about the influence television has on the reading habits of junior high school students. He suggests that books dealing with a TV series or lead character might be reading bridges to other kinds of reading for the student.

The same issue of *Language Arts* contained a summary of a Philadelphia inner-city school project that capitalized on students' intimacy with the medium to stimulate reading and creative writing (Bernard Soloman, "The Television Reading Program"). The most comprehensive book to be published was Rosemary Potter's *New Season: The Positive Use of Commercial Television with Children* (Charles E. Merrill, 1976).

It seemed to us, however, that the literature has not reached the heart of the problem—the causal relationships among program content, viewer assimilation, and manifested behavior. It is essential for teachers to know about the effect of television viewing on children as it relates to their intellectual and emotional development so that they can in turn deal with the behavior manifested by these influences in classroom learning. We must go beyond the fun and games of the current literature and engage in a serious struggle for the positive development of student behavior and learning patterns. Where

once we trained teachers to use instructional television effectively, we are now facing a new need—to train teachers to use commercial television for positive student intellectual and emotional development.

An inservice training model was developed out of sessions with teachers who indicated a need to understand television and its effect on children. The ideas and content of the inservice workshop were refined in sessions with teachers throughout the spring and summer in various Midwestern states. The workshop was then piloted in the late summer and early fall of 1976 with selected public school, nursery school, and Head Start teachers in Illinois and Wisconsin.

## The Workshop Format

As with any inservice model, the stage must be set for the audience to tune in to the topic. Background questions related to current research and educators' comments are expressed through a short multimedia production developed for this purpose. A review of past and current research highlights and identifies areas of concern about the effect of TV viewing on the child as well as revealing the various areas of conflict in research findings.

The presenters turn immediately to the commercial television scene. A review of current commercial television fare in representative categories—situation comedies, cartoons, police shows, and so forth—is demonstrated through the identification of scenes, situations, and conflicts that could affect the subsequent behavior of the child in the classroom.

Television viewing by the child can result in negative or positive patterns in six areas of child learning and development. The presenters define and discuss fantasy-reality differentiation, emotional-attitudinal development, modeling, aggression, pro-social behavior, and stereotyping.

The heart of the workshop helps the participant become a "TV-aware teacher." Knowledge of program content, behavior-prediction techniques, methods for obtaining parent-teacher cooperation, and recommended viewing all are focused upon. A hands-on approach is used to give practice as well as information in this session.

The learning goal for the workshop is to develop teachers who are familiar with program content, can match this content with student behaviors manifested in the classroom, can develop classroom activities to counteract or reinforce these negative or positive behaviors, and can develop a relationship with parents to continue positive, related activities in the home.

# PUBLIC RADIO: EDUCATION'S LEAST-USED MEDIA RESOURCE

PATRICK D. HAZARD

I've known about the "educational" potential of radio ever since my days as a seventh-grade teacher in East Lansing, Michigan. I went on the Michigan State FM outlet to discuss "Motivating Teenagers in the Elvis Presley Era." In my enthusiasm—it was my pioneer radio broadcast—I kept referring to the students as "kids." A few days later a postcard arrived chiding me for alluding to the children as "young goats." Although I regarded this listener reaction as schoolmarmy to the point of ludicrousness, I find, looking back over twenty-five years of teaching and broadcasting, that I've never used the term "kid" —away from a farm or zoo—since. Radio does teach, and so do critical listeners.

It was while I was in England, directing a U.S. Office of Education study on using the newer media in English classrooms, that I first began to be aware of how imaginative and feisty good radio could be. I became an addict of the highbrow *Third Programme* and a helpless guffawer at the *Goon Show* (the zany godfather of Monty Python and other BBC absurdities). More recently I taught a course about radio at Santa Rosa Junior College in California where I came to appreciate the teaching potential of public radio.

It was in 1967, when the federal government first began to do something fiscal about noncommercial broadcasting's shoestring budgets, that "educational" radio turned "public." Use of the new term was intended to exorcise the dull image that educational TV and radio had acquired. Media users began to realize that since radio is about one-tenth as expensive as television that radio could afford to take risks and serve a more diverse public.

There are now 210 affiliates in the National Public Radio (NPR) chain providing 30 to 40 hours of programming a week. These programs form a treasure trove of recyclable material for the classroom. For example, the hour-long *Options in Education* deals with many issues that teachers confront in the course of an academic year. The weekly *Voices in the Wind* explores the arts in America. Recently NPR pioneered a new and very promising form of institutional cooperation with the National Endowment for the Arts—a month-long series of programs on the place of art in American culture with special treats such as the first radio production of a musical comedy in many years.

It is possible for teachers at all education levels to use NPR as a learning experience in their classrooms. It is a medium where the teacher and students can be both producers and consumers. The only equipment necessary to make airworthy cassettes is a SONY TC-42 (about $150) and a broadcast quality microphone (about $100). As producers, for example, my class celebrated the centennial of Luther Burbank's arrival in California with a poetry and country music festival taped for later replay. We also noted the anniversary of Jack London's birth by taping a conversation held during a jeep ride with the inheritor of the famous writer's ranch. KALW-FM, the public radio outlet of the San Francisco Unified School District, broadcast this tape along with an interview with the director of the Jack London museum. As these examples show, it is possible to produce viable radio programs without professional broadcasting training.

Even if teachers and students do not produce their own programs, there are endless possibilities for using NPR as an instructional tool. A standard AM/FM cassette recorder (about $50) is all that is necessary for taping. My students, for example, were asked to outline as they listened to *All Things Considered* (a 90-minute news program with a magazine format). I found this to be an excellent device for testing how well freshman English students could take notes on material that was interesting as well as intellectually complex. During a recent broadcast they heard fascinating features about a Harvard physician who is decentralizing medicine, a Chicago theater director who teaches lawyers to use theater techniques in their courtroom presentations, and an interview with J. Carter Brown, the director of the National Gallery in Washington, D.C., about the gallery's new East Building.

*All Things Considered* is a daily patchwork quilt of America. Some days as many as ten local affiliates contribute material. Listeners are urged to make themselves heard by means of a 4-minute cassette commentary or by a letter requesting a beeper phone interview. I have done two such "editorials"—one on how best to use a Eurailpass and the other on the art calendar boom—and it is a satisfying feeling to speak to the nation when you have something interesting to say.

If your city doesn't yet have a NPR affiliate, write to National Public Radio, 2025 M Street NW, Washington D.C. 20036 for a brochure giving a summary of the programs it makes available for purchase. Either as producer or consumer you can beat electronic inflation by becoming a patron of these flexible and diverse educational programs.

# NATIONAL COURSES THROUGH TELEVISION

KIKI SKAGEN MUNSHI
DARRELL ICENOGLE

Media—newspapers, radio, and, most particularly, television—have been effective aids in the process of reaching the "new learner." Working with various institutions throughout the nation, University Extension at the University of California, San Diego has created a number of outstanding television courses over the past few years. These courses have found users far beyond our immediate area. Hundreds of institutions and thousands of students have participated and we now find ourselves part of a national network to create a new kind of learning experience.

## Developing the Course Components

Students taking one of our television courses—these include *The Ascent of Man, Classic Theatre: The Humanities in Drama, The Age of Uncertainty,* and *Perspectives on Effective Parenting*—receive materials that integrate the efforts of several institutions. The National Media Office at UC San Diego Extension, often working cooperatively with another institution of higher education, provides the basic print materials and suggestions for a course format. The television programs are developed by a major production organization, then aired on Public Broadcasting TV stations or rented from the appropriate agency. Colleges and universities across the nation offer the courses as part of their curriculums.

Each institution that offers one of our courses assigns the course to a department, determines the appropriate number of credit hours, and adds or deletes the assignments needed to tailor our materials to the needs of its particular student body. The individual institution also uses its own financial structure in determining fees and follows its own tion and examination pro- Costs are low in relation to quality, for not only have the materials been developed as self-contained study packages, but each course has been created by outstanding scholars and faculty from the University of California and other institutions.

## Who Watches Television?

Central to each course is a series of excellent television programs. We feel that programs must have two qualities before they can be considered as the basis of a television course: They must be as interesting and engaging as good commercial television in order to hold the viewer's attention, and they must include enough content matter to be used as a vehicle for an academic program. We have identified three sets of viewers who learn from these programs; the television program should, ideally, satisfy all of them. First there are those who simply watch a program for enjoyment. Then there are those who watch a program for what they can learn from it and who, perhaps, will read a certain amount of supplementary material. Finally, there are those who take a course for credit and who need to feel that their time in front of the set has been well spent.

## Supplementary Materials

Although we rely on television as a primary vehicle, we have found that television alone isn't sufficient as an instructional tool. Class members shouldn't attempt to take notes during the course of a program because the unique role of visual materials is lost if students are bent over notebooks. However, since viewers cannot assimilate and remember everything they have seen in an hour with Jacob Bronowski or in a series of interviews on child development, we use print to supplement programs, to elaborate concepts, and to put information in a form that is available to students, at any time throughout the semester. We have found that usually a text that closely follows the programs, together with a book of supplementary readings, provides the additional content students need.

Because many television students are at home rather than in a classroom with an instructor, a third print component is needed to supplement the programs, text, and readings. A Study Guide, to some extent, takes the place of an instructor. It tells students when to watch for important points, provides self-test questions, and supplies necessary background information. We do not say that the Study Guide replaces an instructor completely, for we have found that neither printed materials nor teachers are obsolete. At least two contact sessions on campus are recommended during a course for questions, review, discussions, and sociability. In our evaluation studies we have found that, both in television-based courses and in the traditional classroom, the efforts institutions and instructors make are directly related to student response.

## A Trial Course

Since we still use printed materials and feel that human contact plays a valuable role in education, some people have asked whether television courses are effective. Fortunately, circumstances gave us a chance to judge the effect of a television component in our first offering—a course on introductory psychology. The learning materials (e.g., textbook, study guides, records, self-check quizzes, and computer scored examinations) had been employed by the University of California's Independent Study Division in a correspondence format. The only difference from the course that was subsequently offered was the absence of television programs. After two years' experience the completion rate for the correspondence course

was about 25%. This percentage was in the average to high range for correspondence courses nationally. The TV course, after the same period of time, had about 65 to 70% completion—a rate that compares favorably with traditional in-class instruction.

### Looking Toward the Future

This experience, supported by subsequent research, has indicated that television is more than a means of transferring information. It serves as motivating agent and pacer. Through the years we have learned that television can entertain, persuade, and aid in the production of effective learning. Our efforts have had a variety of impacts. The Bronowski series offered a master teacher at work and utilized the full resources of an opulent budget in 27 countries. *Classic Theatre: The Humanities in Drama* brought an immediacy to great literature that is not available through print. *The Growing Years*, a course on child development, took students into laboratories and introduced them to outstanding scholars in the field. Through these and other courses now under consideration for production we hope that University Extension at the University of California, San Diego, will continue to provide new modes of utilizing television to reach both traditional and nontraditional student audiences.

# A READER'S GUIDE TO VIDEODISC TECHNOLOGY: A SELECTED ANNOTATED BIBLIOGRAPHY

R. KENT WOOD

*EDITOR'S NOTE: The following is an annotated bibliography on videodisc—the latest video technology. While some observers equate the development of videodisc with the invention of printing, others see it as just another gimmick. Both views are represented in the following items, which were selected from technical, popular, and news periodicals, brochures, and books. The bibliography is intended to meet the needs of the casual or serious reader. The compiler of the bibliography is currently working on research and development projects for Utah State University's MCA Discovision Educational/Industrial model.*

"A Right to Replay?" *Time* (April 11, 1977), p. 64.

A short review of the case of Sony Corporation versus Universal and Walt Disney Studios in which the legal question of home video recording on Sony's Betamax videotape recording machine will be decided. The case in all likelihood will be a long court battle taken all the way to the Supreme Court of the United States. It will have a great effect on the investment Music Corporation of America (MCA) has made in producing videodiscs for the home consumer market.

Alden, Robert. "Video Disc System Alternatives," *IEEE Transactions on Consumer Electronics* (November 1976), pp. 302-303.

The director of research for Zenith Corporation explores the major videodisc systems and the reasons the videodisc is so interesting for today's communication media: very low cost, very high information density, and instant access to any portion of a long recording. The director also discusses a new semiconductor laser system development.

Bennion, Junius L. *Authoring Procedures for Interactive Videodisc Instructional System.* Submitted as partial fulfillment of the requirements for the doctoral degree in instructional psychology. Provo, Utah: Brigham Young University, Division of Instructional Research Development and Evaluation (March 1976), Illustrated, 88 pp.

The manual provides (1) a summary of videodisc technology and its application to individual instruction, (2) a review interactive of videodisc parameters and branching programs, and (3) guidelines for and examples of interactive videodisc authoring procedures.

Bennion, Junius L. and Edward W. Schneider. "Interactive Videodisc Systems for Education," *Journal of the Society of Motion Picture and Television Engineers* (December 1975), pp. 949-953.

A discussion and explanation of how the videodisc may be programed for interactive use in training and education. The "freeze frame, electronic address, and fast random access make possible the creation of a new audio-visual delivery system that has applications for individualized interactive instruction." The article has also developed formulas for a costing model.

Benson, K. Blair. "Videodisc Update," *Journal of the Society of Motion Picture and Television Engineers* (March 1977), pp. 144-145.

Presented as a paper to the first International Videodisc Conference in New York City, November 15, 1976, it reviewed the major developments and systems used in videodisc technology.

Bogels, P. W. "System Coding Parameters, Mechanics and Electro-Mechanics of the Reflective Video Disc Player," *IEEE Transactions on Consumer Electronics* (November 1976), pp. 309-317.

A technical paper presenting considerations involved in the choice of a coding system for an optical videodisc system. It is one of a series of papers presented collectively by MCA, Zenith, and North American Philips, and describes recommendations that may result in the best possible solution for the important new medium of videodisc. (Also included in *Journal of the Society of Motion Picture and Television Engineers* (February 1977), pp. 74-79.

Bouwhuis, G. and P. Burgstede. "The Optical Scanning System of the Philips 'VLP' Record Player," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 572-575.

Explains how the optical system is used to read out the information stored in the form of a pattern of small pits in the surface of the 'VLP' record (disc).

Boyle, Deudre. "Whatever Happened to Videodisc," *American Libraries* (February 1977), pp. 97-98.

Although pessimistic about the future of the videodisc, suggests application if the present U.S. 525-line TV standard improves. Suggests applications in reference work, information storage and retrieval, but implies such applications are a "long way off."

Bradshaw, H. Jerry. *An Overview of Videodisc Technology: Some Possible Influences on Our Libraries in the Near Future.* A paper presented to the Utah Library Association (March 1, 1975), 13 pp.

Reviews the impact videodiscs are having on libraries. Suggests the publication of "videotextdisc," which would be a book in "freeze frame" for reading, mixed with a film producers' version for motion viewing. Makes suggestions of what might be done to enhance more rapid videodisc utilization for libraries.

Bradshaw, H. Jerry. "Videodiscs-Future Shock," *Utah Libraries* (Spring 1975), pp. 10-16.

A film library manager suggests applications of videodiscs, film, and other media in libraries. An edited version of a paper delivered to the Utah Library Association on March 1, 1975.

Braun, Ludwig. "Microcomputers and Video Disc Systems: Magic Lamps For Educators?" A Paper prepared for the National Institute of Education, 1977. Revised versions and excerpts have appeared in *Personal Computing*, January, 1978, pp. 103-104; *Peoples Computers*, January-February, 1978, pp. 14-15, 47 and a series of three articles in *Calculators/Computers*, January, February and March, 1978, were also based upon the National Institute of Education Report.

A review of personal computers and videodisc systems, with the purpose of evaluating the present state of development of microcomputer and videodisc technologies as they relate to education.

Bricot, C., J. C. Lehureau, and C. Puech. "Optical Readout of Videodisc," *IEEE Transactions on Consumer Electronics* (November 1976), pp. 304-308.

A report presented by F. Le Carvennec of Thomson-CSF Research Laboratories of France on recent developments relating to videodisc systems readout based on prototypes that use a low-cost flexible transparent videodisc.

Broadbent, Kent D. "A Review of the MCA Disco-Vision System," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 554-559.

The vice-president of Disco-Vision and director of MCA's videodisc research program reviews the "state of the art" developments to 1974 for the MCA system. Diagrams and technical data add to the usefulness of this article (available from MCA in brochure format as a reprint).

Brudner, Harvey J. "The Past, Present and Future of Technology in Higher Education," *The Journal: Technological Horizons In Education* (March 1977), pp. 14-17, 22-26.

A former president of Washington House Learning Corporation and a senior consultant to the United States Office of Education reviews the educational technology of the past, and projects what some of the new videodisc technology can mean to higher education.

Bulthuis, K. and George C. Kenney, II. "Philips, MCA Videodiscs Systems," *Journal of Optical Society of America* (April 1976), p. 379.

An abstract of a 25-minute paper on laser and electro-optical systems delivered to the society conference on May 25, 1976 in San Diego, California. Mr. Kenney's address is Philips Laboratories, 345 Scarborough Road, Briarcliff, NY 10510. The article describes the videodisc system with optical system, serves, and signal processing.

Bussche, W. Van Den, A. H. Hoogendijk, and J. H. Wessels, "Signal Processing in the Philips 'VLP' System," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 567-571.

Explains how the Philips system is recorded in a single track on the 'VLP' record, in technical language with diagrams.

Cavanagh, R., N. Adamson, and F. Kot. *Consumer Optical Videodisc Player.*

An illustrated paper presented to the annual International Tape Association meeting at Hilton Head, South Carolina, April 3-6, 1977. A review of the "state of the art" for the consumer videodisc player to be distributed in the late 1970's as built by Magnavox, a subsidiary of North American Philips.

Cavanagh, R. T. "Educational/Institutional Features of the Optical Videodisc System," *Journal of the Society of Motion Picture and Television Engineers* (April 1977), pp. 201-203.

Describes a reflective optical videodisc system with laser readout that has special application for educational/industrial institutions. The Philips/MCA system has a low-cost home/educational center and a more elaborate industrial/educational model of MCA that may be linked to a microprocessor, a keyboard, and/or a variety of other peripherals. The first few thousand tracks on a single disc (holds 54,000 tracks) may be used to store branching instructions and to control the display of frames on the rest of the disc. Interchangeability of discs in the MCA and Philips system is suggested.

Compaan, K. and P. Kramer. "The Philips 'VLP' System," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 564-566.

Explains the video long-play recording system of the Philips Corporation and its applications to the home consumer market. (MCA and Philips have cooperated, resulting in a standard means of playback, and making the MCA disc playable on the Philips recorder. This recorder will be manufactured by Magnavox—compiler's note.)

Dann, Michael H. *The Videocassette and Video Disc in the Development of the Communications Media.* Bethesda, Maryland: ERIC Document Reproduction Service (October 3, 1973), ED 084 790.

Stresses the great amount of money expended on hardware development, with little attention paid to the development of software for video recording systems. Suggests that if the industry would invest $50 million in software development, a multimillion-dollar industry would develop within three years.

Daynes, Rodney R. *Videodisc Technology Use Through 1986: A Delphi Study.* Navy Personnel Research and Development Center, San Diego, California (December 1976), 41 pp. NTIS Document AD-A034/857.

This research report forecasts the potential impact of videodisc technology from 1976 to 1986 by using the opinions of a panel of experts. The report suggests that "optical" videodisc technology is more suited to Navy training requirements. More than 100 experts from the fields of research and development, hard- and software manufacturing, and education were polled. Conclusions are that videodisc will be a major AV training system by 1986. Specific findings relate to mass communications, cultural impact, commercial applications, education quality, feasibility, and library

applications. A preliminary report was given at the Association of Educational Communications and Technology Conference in 1976.

Drukker, Leender. "Audiovideo Playback: TV: The Little Box Is about to Grow Up," *Popular Photography* (June 1976), pp. 109-110.

Suggests that home programing by low-cost videodiscs will give TV viewers, for the first time, a choice of when they will watch what programs. Suggests that videodisc development will "take us, culturally, out of the TV dark ages."

Drukker, Leender. "Next Year, You May Be Able to Pick Your Own TV Program," *Popular Photography* (August 1975), pp. 40, 208.

A two-page update on videodisc developments projecting that MCA and Philips are to begin national marketing of videodiscs [in the late 1970's]. Compares RCA, MCA with short mention of the Sony Betamax videotape recording system.

Evans, Art. "Videodisc on the Horizon," *Audiovisual Instruction* (May 1975), pp. 31-33.

The vice-president of Oxford Films compares the videodisc with film formats and sees a rather gloomy picture of costing products in competition with videodisc programs. He suggests that a program a film laboratory currently sells to a distributor for $20 to $30 would cost "a dollar or so" in videodisc format. He concludes by suggesting AECT must begin to consider this new format and gives prospects and pitfalls.

Farber, Ed. "The New Videodisc Is Now a Reality," *Modern Photography* (March 1976), pp. 61-63.

A descriptive article on the future of videodiscs with applications for photography.

Free, John. "Here at Last: Video-Disc Players," *Popular Science* (February 1977), pp. 85-87, 140.

Compares the MCA/Philips and the RCA videodisc systems players, concluding that the multi-million-dollar development efforts for videodisc systems may be well worth the high investment.

Free, John R. "Videodiscs for Your Color TV," *Popular Science* (November 1974), pp. 92-95, 144-145.

Reviews the Teldec, Zenith, CSF Thomson, MCA Discovision, I/O Metrics and the RCA videodisc systems. Suggests that the Japanese are hard at work developing videodisc systems.

Gerson, Robert E. "Videodisc-Videotape, 1976," *Radio-Electronics* (June 1976), pp. 38-40, 88.

Compares videotape and videodisc systems.

Gerson, Robert E. "Coming Soon, Home Video-players," *Radio-Electronics* (June 1975), pp. 33-35.

A visual and verbal review of videodisc systems and status up to 1975—for the layman.

Hensey, J. L. *Philips and MCA Optical Videodisc System.* A paper presented to the American Library Association, Detroit, Michigan (June 19, 1977), 8 pp.

A representative of North American Philips confirms that the videodisc system of Philips and MCA will be compatible with home consumer units. The agreement between Philips and MCA requires the MCA to offer a broad range of programs at the same time that the videodisc player is introduced.

Hrbek, George W. "An Experimental Optical Videodisc Playback System," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 580-582.

Describes the development of a thin, flexible, clear polyvinyl chloride (PVC) disc, which uses laser to record and playback data. The experimental work reported in the article was acknowledged with Thomson-CSF Research Laboratories in France.

Kenney, George C. "Special Purpose Applications of the Optical Videodisc System," *IEEE Transactions on Consumer/Electronics* (November 1976), pp. 327-337.

Describes examples of special purpose applications employing the Philips consumer player, such as digital "read-only-memories, X-ray and document storage, and a talking encyclopedia." The entertainment function of the Philips and MCA Optical Videodisc System has been established by numerous public demonstrations, but, according to the author of the article, the "freeze frame" and the "random access" capabilities of this optical system enables extremely effective storage of special purpose information.

Kessler, William J. "Keeping in Touch with Technology," *Public Telecommunications Review* (August 1974), pp. 28-33.

An update on available hardware written for the professional in telecommunications. Video recording devices are reviewed in the latter part of the article, with coverage of videodisc developments.

Kincheloe, Fontaine. "Sponsored Films and the Videodisc Revolution," *Educational and Industrial Television* (April 1976), pp. 32-36.

A review of videodisc technology by the president of Karol Media, a distribution company for sponsored and rental films and former vice-president of Modern Talking Picture Service. He believes videodiscs may become a major communication medium and a primary format for sponsored films because of their low cost as a mass medium.

Kreiman, Robert T. "The Videodisc: The Next Step in the Communications Evolution," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 552-554.

Relates videodisc development to other AV formats and suggests the use of film and videotape as editing media for videodisc production.

Lachenbruch, David. "The Video Discs Are Coming," *Radio Electronics* (August 1974), pp. 41-44, 88.

Describes and illustrates the videodisc systems including Telefunken/Decca, Philips, MCA, Thomson-CSF, Zenith, I/C Metrics, RCA, Digital Recording Corporation, and the MDR (magnetic disc recorder), a West German invention.

Lanier, Robin. "TV Revolution," *New York Times Magazine* (May 25, 1975), pp. 9, 43, 50-52.

Discusses the competitive battle between MCA and RCA videodisc systems, suggesting that whichever wins, the home viewer will be able to view everything from ballet to cooking lessons. A detailed description of the two systems is given with diagrams explaining their basic functioning.

Laub, Leonard. "Optics of Reflective Videodisc Players," *Journal of the Society of Motion Picture and Television Engineers* (November 1976), pp. 881-886.

A technical paper presented on June 8, 1976 in Chicago at the Institute of Electrical and Electronics Engineers Spring Conference on Consumer Electronics. It discusses principles of scanning, transfer functions, focusing considerations, and the servomechanisms used with reflective videodisc.

Mathieu, Michel. "A Random Access System Adapted for the Optical Videodisc: Its Impact on Information Retrieval," *Journal of the Society of Motion Picture and Television Engineers* (February 1977), pp. 80-83.

Describes the Thomson-CSF and Philips/MCA videodisc systems, suggesting strong capabilities for industrial applications, such as decentralized parts catalogs and card file retrieval systems and individualized, interactive learning with branching programs. Diagrams the optical scanning system, address search, frequency spectrum of recorded signals, and positioning of numerical information in the blanking-interval part of the disc tracks. Suggests that 10 seconds is the maxium time to access a single picture from more than 40,000.

"MCA and Philips Premiere Their Optical Home Video-disc System," *Broadcasting* (March 24, 1975), p. 46.

A review of the demonstration of the Philips/MCA videodisc system in New York that was held for reporters when the companies' marketing plans were announced.

*MCA Disco-Vision* (n.d.), unpaged pamphlet.

A color-printed pamphlet introducing the layman to the MCA videodisc system, with references to newspaper reviews and *Television Digest*. Available by writing MCA, Disco-Vision, Inc., 100 Universal City Plaza, Universal City, CA 91608.

*The MCA Disco-Vision Industrial Player* (n.d.), 12 pp.

A descriptive brochure of the educational/industrial videodisc player, now available by special arrangements through MCA. The industrial player has been specially designed for instruction, training, audiovisual archive file retrieval, and other communication uses by federal and military agencies, educational/scientific institutions, and private industry. It is more rugged, more sophisticated, and more durable than the home consumer unit. The video format is standard NTSC, 525 lines, 30 frames per second. Available by writing MCA, Disco-Vision, Inc., 100 Universal City Plaza, Universal City, CA 91608.

Mickelson, Lee; John S. Winslow, and Kent D. Broadbent. "Use of the Laser in a Home Videodisc System," *Annals of the New York Academy of Science* (January 30, 1976), pp. 477-481.

Describes the initial aim of the research efforts of MCA Disco-Vision "to put at least 20 minutes of color TV on a 12-inch disc and play it back in the consumer's living room." The disc was chosen so as to allow the recorded information to be replicated quickly and to keep costs low or comparable with replication of an audio long-play record as now distributed for music use. Discusses in technical, scientific terminology the Disco-Vision system, the result of a multimillion-dollar research effort.

Moor, Paul. "Color TV from a Video Disc," *Saturday Review* (September 25, 1971), p. 73.

An early short review of videodisc technology for the general reader.

"New Low-Cost Video Recording and Playback Systems Unveiled," *American Cinematographer* (March 1974), pp. 304-307, 339, 341-342.

A descriptive article on a new low-cost videodisc recording and playback system developed by I/O Metrics and demonstrated by Peter G. Wohlmut, president. The discs demonstrated capacity for one hour of color television or 500 SIC—50 hours of high-fidelity music. The recording unit was estimated to cost $30,000 with the playback unit selling for around $300. It was made clear that I/O Metrics *did not* intend to market the system, but were negotiating with other companies for the marketing arrangements. This system uses a disc of holographic film for the storage device.

"The New Television," *Forbes* (June 1, 1975), pp. 24-29.

A lively, journalistic article written and illustrated for laymen, reviewing MCA/Philips and the RCA videodisc system, suggesting educational and entertainment uses. Compares cost factors, playing time, and other details.

"New Tricks Your TV Can Do," *Changing Times* (October 1976), pp. 19-20.

Briefly reviews TV games, videodisc, and large screen TV.

"Next in TV: Video-Disc Players . . . Buy Movies Like Phonograph Records," *U.S. News and World Report* (November 24, 1975), p. 44.

A one-page descriptive news announcement of the videodisc systems, including the stylus and laser types.

Pfannkuch, Robert. "Characteristics of Videodisc Systems," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 585-586.

An introduction to a panel discussion on videodisc player systems held on April 26, 1974 at the Society's Technical Conference in Los Angeles, California. Questions raised in the paper concern compatability of systems, mechanical vs. optical systems, time capacity, manufacturability, serviceability, and costs. The panel discussion follows on pp. 586-587.

*Philips and MCA Videodisc System* (n.d.), limited number available from the New York office of North American Philips.

A four-page color-printed brochure, describing and illustrating the new Philips/MCA videodisc system. Lists the characteristics of visual random access, frame by frame presentation, and ease of operation for entertainment, instruction, training, and children's programing, as well as a selection of MCA films to be available with the new videodisc system.

*Program Production Guide for MCA Industrial Optical Video-disc System* (NTSC Version), (n.d.), unpaged.

A short guide published by MCA Disco-Vision in 1977 to introduce

their first educational/industrial player units.

Rice, James, Jr. "There's A Videodisc In Your Future," *Library Journal* (January 15, 1978), pp. 143-144.

Reviews the unique characteristics of videodisc technology and suggests that librarians are eagerly awaiting the advent of the videodisc because of its durability, accessibility, and capacity for volume of materials in visual, sound and print.

Robson, Wall. "Is It True What They Say About Videodiscs?" *Training* (December 1975), pp. 80-82.

The president of Media Services Group in Redwood, California reviews the extensive capabilities of videodisc technology for training, education, and information services by the tie-in with a microprocess (computers). The programable characteristics of videodiscs are emphasized.

Rozinsky, Saul. "Comes The Revolution . . .," *Technical Photography* (August 1977), pp. 20, 50.

The chief television engineer for Pace University of New York City, an active video consultant, reviews the potential of videodisc technology from the point of view of "short-run" training projects on super 8mm film. Reviews the lack of programs on videodiscs, and is rather pessimistic of the immediate applications (except for mass marketing videodiscs).

Ruark, Henry C. "MCA V-Disc On U.S. Market in Fourth Quarter, This Year," *Technical Photography* (May 1977), p. 12.

Notes that the first MCA customer is the Central Intelligence Agency and that MCA will beat RCA (its competitor in the videodisc) to the market and will gain a distinct advantage over RCA.

Ruark, Henry C. "Video-disc Developments: Impact on Production and Marketing," *Technical Photography* (August 1975), pp. 16-24, 28, 33.

A discussion of the predicted impact of videodiscs on home and educational markets in the near future. Reference and camparisons are made to the Sony Betamax videotape recording system, showing a raw materials cost advantage with the disc of 70 to 1.

Ruark, Henry C. "The Videodisc Impact on AV Technology," *Functional Photography* (January 1976), pp. 17-32, 33.

A former AV consultant to the Oregon State Department of Education, now consultant and writer, suggests that "there is little doubt about the most significant AV technology development of last year, and what will be the strongest influence shaping this year too: The Videodisc!" Ruark further suggests that the videodisc format will have great impact on every phase of communications and that the AV world will never be the same again.

Salsberg, Arthur P. "The Videodisc Cometh" *Popular Electronics* (June 1975), p. 4.

An editorial describing videodiscs as the next major development for the home TV market.

Schneider, E. W. "Videodiscs, or the Individualization of Instructional Television," *Education Technology* (May 1976), pp. 53-58.

Compares costs of various audio-visual reproduction systems with videodiscs and suggests that videodiscs are lowest in cost when more than 1,800 images are required. Concludes that initial programs must follow instructional development processes if interactive videodiscs are to reach their potential.

Seidel, Robert J. and Rubin, Martin, eds. *Computers and Communications: Implications For Education*, the proceedings of the Conference on Computer Technology in Education for 1985 held at Airlie House, Warrenton, Virginia on September 15-18, 1975. New York, Academic Press, 1977.

Videodisc applications in education are mentioned in several articles, but the major papers directly bearing upon videodisc include "Intelligent Video Disc Systems—Implications For Education" by Arthur W. Luehrmann, pp. 367-369 and "Applications of Videodisc Technology to Individualized Instruction" by Edward W. Schneider pp. 313-325. Schneider gives several illustrations and charts on cost comparisons of videodisc to other media such as 16mm film, 8mm film and video cassette. Conclusions are that videodiscs will likely have profound effects upon how content is organized for educational systems and that videodiscs will set new standards for inexpensive large scale media distribution.

"Small Luxembourg Firm Plans to Market MDR Before Its Giant Competitors Do;" *Electronics* (November 25, 1976), p. 63.

Discusses a magnetic disc recording device for video systems that uses a special chrome dioxide system and is capable of recording two hours of video on each side of the disc. The small firm has the only disc system that both records and plays on reasonably priced videodiscs. The system unit cost for the player is projected at $700, with $11 for discs.

Smith, Robert Frederick. "A Funny Thing Is Happening to the Library on its Way to the Future," *The Futurist* (April 1978), pp. 85-91.

A general article on the future libraries which include discussion of videodisc technology as a major information delivery system. The article treats several technologies with emphasis upon videodisc implications for libraries.

Sturm, Ralph E., Eril L. Ritman, Robert J. Hansen, and Earl H. Wood, "Special Communications, Recording as Multichannel Analog Data and Video Images on the Same Video Tape or Disc," *Journal of Applied Physiology* (June 1974), pp. 761-764.

Describes how as many as 16 channels of analog data can be simultaneously recorded on videodiscs for medical applications.

"Thomson-CSF Re-aims Videodisk Player At Educational and Industrial Buyers," *Electronics International* (January 6, 1977), pp. 55-56.

Reports that the Thomson-CSF Research Laboratories of France plans to produce some 1,000 videodisc players and is aiming its primary efforts at industries such as Renault. Thomson's system uses 12-inch discs made of flexible plastic. This French system is compatible with NTSC standards (U.S.) or the European standard (1500 or 1800 rpm) and provides step-by-step slow motion and freeze framing. (Informed sources have suggested that Bur-

rough's Computer Corporation, Thomson, and Controlled Data are planning a team effort to tie into computer-bases systems—compiler's note.)

Vance, Adrian. "MCA, Philips Join Forces: Videodisc Player for Any TV Set Now Targeted for '76," *Popular Photography* (May 1975), pp. 97-98.

Discusses the educational entertainment capabilities of the videodisc. Notes that the disc has 50 times the capabilities for programing as a 250-page programed "scrambled" textbook. Relates the current filmstrip to the video format of the disc, suggesting that because of the low-cost economics presented by the videodisc that MCA Disco-Vision (brand name of videodisc system) promises to bring about a revolution in both education and entertainment.

"Video in the Round," *Time* (October 20, 1975), p. 75.

A one-page descriptive news announcement of major videodisc systems heralding changes in TV programing.

"The Videodisc Rebolution: A New Medium of Information," *The Futurist* (October, 1977), pp. 311-312.

A review of videodisc systems including MCA/Phillips, RCA and Telefunken/Decca (TelDec), suggesting that low cost videodisc coupled with television via satellite may make TV communication available and affordable everywhere on earth.

"Videodiscs: The Expensive Race To Be First," *Business Week* (September 15, 1975), pp. 58-61, 66.

An extensive review of videodisc developments giving special attention to the RCA and MCA videodisc systems.

"Videograph," *Scientific American* (May 1975), p. 45.

A short notice of videodisc developments.

"Why Sony's Betamax Has MCA Seething," *Business Week* (November 29, 1976), pp. 29-30.

Background of copyright case that MCA's, Universal City Studios and Walt Disney Studio, have brought against the Sony Corporation, with videodisc implications.

Wilcox, R. Max. "Special Report: 4 Million Catalog Cards on Seven Little Platters; Library Spinoffs from Videodisc Technology," *American Libraries* (December 1975), pp. 682-683.

Develops analogies of the storage capacity of the disc. Notes that one disc will contain 500-page books or more than 100,000 slides. Seven discs will contain more than 4 million library catalog cards. Suggests extensive potential use of videodisc for education and in libraries.

William, E. "Image-Disc Designers Must Get in the Groove on Systems," *Engineer* (January 1976), pp. 20-21.

Videodisc technology seen from a British viewpoint; suggests problems with some of the European systems and briefly reviews the major systems.

Winslow, John. "Mastering and Replication of Optical Videodiscs," *Journal of Optical Society of America* (April 1976), p. 379.

An abstract of a 25-minute paper delivered to the society's conference on laser and electro-optical systems, May 25, 1976, held in San Siego, California. The paper discusses quiet, reliable gas lasers that produce nearly undistorted wave fronts. These are of prime importance for mastering videodiscs. Mr. Winslow's address is MCA-Disco-Vision, Inc., 100 Universal City Plaza, Universal City, CA 91608.

Winslow, Ken. "A Videodisc in Your Future," *Educational and Industrial Television* (May 1975), pp. 21-22.

Reviews the advantages of videodisc systems.

Winslow, Ken. "Videodiscs: Reality Begins (Almost)," *Education and Industrial Television* (November 1974), pp. 36-40.

Discusses the Philips/MCA agreement and the effect it will have on the videodisc age.

Wood, Donald N. and Donald G. Wylie. *Educational Telecommunications*. Belmont, California: Wadsworth Publishing Company, 1977.

A recent TV textbook gives discussion of videodiscs on pages 62, 64, 172, 277-278, 279, 287, 338. Suggests a strong need for research on how to best use the new capabilities of videodisc systems.

Wood, R. Kent and Kent G. Stephens. "Videodiscs an Immediate Future Shock for Educators," *International Journal of Instructional Media* (1976-77), pp. 229-233.

Suggests that many educators are unfamiliar with the application of videodiscs. After describing characteristics and advantages of major videodisc systems, projects cost and relationships to present print and nonprint media.

Wood, R. Kent. *Videodisc Update '77*. A paper presented to the American Association of Agriculture College Editors Annual Conference at Utah State University, Logan, Utah (July 14, 1977), 10 pp.

Reviews the early attempts of TV research and development specialists to use videodiscs for mass information, journal, and magazine publications.

Wood, R. Kent and Kent G. Stephens. "An Educator's Guide to Videodisc Technology," *Phi Delta Kappan* (February 1977), pp. 466-467.

Reviews two major videodisc systems, suggesting educational applications will follow the introduction of these systems in the commercial market. Sees videodiscs as prime tools to be used by educators in the teaching/learning process.

Zwaneveld, Eddy H. A. E. "An Audiovidual Producer User's View of Videodisc Technology," *Journal of the Society of Motion Picture and Television Engineers* (July 1974), pp. 583-585.

A review of Brigham Young University's audiovisual program needs and practices stressing that videodiscs can reduce the costs and bulk of storing and transmitting information. A brief review of major videodisc systems, with an evaluation of what the new videodisc technology can eventually mean to a large producer/user of audiovisuals. Compares the cost of videodiscs with slides, filmstrips, microfilms, and other film and videotape formats.

# THE MANY INSTRUCTIONAL USES OF TELECOMMUNICATIONS

# MISDEMEANOR: CASE STUDY OF A VIDEOTAPE

YVONNE ELISABETH CHOTZEN
SARAH SANDERSON KING

Three high school girls sneaked an $80 dress out of a Honolulu department store with the intent of returning to get two more. Instead, the three girls ended up sneaking the dress back into the store. One young man returned a television set he had stolen from a local appliance store. These and other cases of planned and actual shoplifting are being shared in classrooms in Honolulu for the first time as a result of viewing a videotape entitled *Misdemeanor*.

What began as a master's thesis in communication at the University of Hawaii has become a successful educational production seen by approximately 14,000 young people in Honolulu. The written thesis and its accompanying 25-minute videotape production became the focal point for a campaign to combat the $30 million a year Honolulu businessmen have been losing to shoplifters.[1] In addition, the videotape has been produced as a half-hour color 16mm film, *Shoplifting: Sharon's Story*.

*Misdemeanor* is a study of what happens to a person arrested for shoplifting, as seen from the viewpoint of the shoplifter. The audience is vicariously placed in "Sharon's" situation as she is caught leaving a Honolulu department store with items she has stolen. The viewer is left to question, "Is it worth it?"

Videotape recording can help us examine the institutions of this society by providing a mirror for cultural feedback. It can help us view the contexts in which we live and structures we have created. An article in the local Honolulu newspaper said of *Misdemeanor*, "It's an example of what its creator calls 'video verité.' It was unscripted, unrehearsed and 'unacted.' The only actor is the shoplifter. Everyone else—store personnel, police officers, judge—merely are themselves in what to most of them was a real, if routine, case."[2]

Video verité is a videotape recording style within the documentary tradition. It strives to capture certain aspects of reality without manipulating the action and without a preconceived point of view. As used in this study, it follows Wiseman's lead of the cinema verité approach: the process of an institution is the essential focus of the recording. *Misdemeanor* is a production about what happens in the arrest process.

Members of the legal system facilitated the recording by agreeing to treat a "planted" shoplifter in the same manner that an actual lawbreaker would be treated for this offense. This was one of the first filmings to be allowed in Hawaii inside an official court of law. A department store, a security agency, the Honolulu Police Department, and the Hawaii State Courts each gave permission for their premises and employees to be videotape recorded while the latter performed their normal occupational functions. Releases were obtained from all individuals who appeared in the recording.

The videotape recording was evaluated with members of the legal system and with the public. Feedback interviews were conducted with the police and with the justices and staff of the court system for the first method of evaluation. For the second method, an audience of high school students was chosen. A test of attitude change and information gain was designed. This utilized the Likert summated rating scale and the true-false question. A pre- and posttest were administered to the students before and after their viewing of the videotape recording. Data were subjected to the *t* test.

Ordinarily, this is where a thesis ends—with copies of the completed thesis being filed in the appropriate academic offices and library. However, the testing situation had given exposure to the videotape, and some of the students who had seen *Misdemeanor* were impressed enough to tell their parents about it, many of whom were in the retail business.

Shoplifting in Hawaii, as in the rest of the nation, is a serious problem. As the news of *Misdemeanor* spread from children to parents, showings began to be scheduled around the city. The Retail Merchants of Hawaii, Chamber of Commerce, requested a showing for their entire Board. Not only did they enlist the use of the videotape, but they sponsored Chotzen's visits to five high schools to tell and show approximately 7,500 students the story of *Misdemeanor*. The ten days before Christmas were chosen for this viewing because statistics for shoplifting soar during the holiday season. The Retail Merchants' campaign against shoplifting paid both for the lease of the videotape and for Chotzen's visits.

The reactions and the results were favorable. The organization members decided to institute a crash program during the summer to reach as many children and teenagers as possible. The Honolulu Department of Parks and Recreation sponsors summer programs for young people. As part of these, Chotzen visited centers showing the videotape and talking with children, age 5 to 18, adapting the presentation to the target audience. With the assistance of the Department of Education, the videotape was shown in public in-

[1] Yvonne Elisabeth Chotzen, "Videotape Verité in the Study Process: A Methodology for the Porta Pak Videotape Recorder" (Master's thesis, University of Hawaii, 1974).

[2] Ken Metzler, "A Burst of Realism Works Against Theft," *Star-Bulletin and Advertiser* (Honolulu), February 9, 1975, pg. A-3.

termediate and high school summer schools. By the end of summer 1976, approximately 14,000 young people had seen and discussed it.

Unlike most film and videotape presentations where the audience is the passive receiver, these sessions encouraged and depended on interaction. Each session began with an introduction to the videotape, telling why it was made (concern over a friend who had dropped out of school after being arrested for shoplifting; and preoccupation with the question—what could be so humiliating about the arrest process that it could produce this reaction?); how it was made (from details of working with the police and through the judicial system to the testing process); and emphasizing the way in which the arrest process begins to absorb the shoplifter who becomes a case, a statistic, losing personal freedom and identity.

The viewers of the videotape are challenged to guess which of the many shoppers who pass "Sharon" as she steals is the plainclothes detective; to observe the fright and bewilderment of Sharon as she is suddenly caught and finds herself in a situation over which she has no control.

After viewing, small-group discussions are held. At one school, in an attempt to reach more students, the videotape was sent by closed-circuit television into several classrooms at one time. This was not as successful a session as those in which students could interact with the leader. When time permitted, role playing enabled members of the classes to take the parts of persons they had seen in the videotape.

For those considering the video verité method for the treatment of problems in their own areas, the following may prove helpful:

1. Observe a philosophy and approach of unobtrusiveness. Video verité requires that you become self-effacing in the sense that you strive to disappear from the scene. This is a way of minimizing the effect of the video camera on the subject. The goal is to blend into the setting, to become a part of the process you are recording to the extent that you do not disrupt that process.

2. Avoid the temptation to intervene in the process you are recording. You are there to record as much natural activity as you can; and to the degree that you intervene, you are interfering with the natural process and the possibility of making a tape about that process.

3. Maintain an attitude of expectation. The act of recording is a kind of discovery. Be ready for the unplanned, the unknown, the unpredictable elements of recording people live and in action. Always be ready to record.

4. Get permission to record people before hand. If an individual objects to being recorded, either before or immediately afterward, erase. Get a signed release from anyone you record if you plan to use the production commercially.

5. Proceed without a script. A general sense of the process to be recorded is a good idea. Informal research into the process before videotaping is an advantage.

6. Avoid the use of actors except, where by necessity, individuals agree to portray themselves in interaction with a process. (It is against the law to tape or photograph live proceedings in a courtroom, for example.)

7. Use a minimum of equipment while still carrying enough to be prepared at all times. Be ready to find incompatible outlets in older buildings. Carry extra adaptors, extra tape, plenty of extension cords, extra batteries, head cleaning fluid, screwdrivers, etc. Depend on available light wherever possible and learn to hold the camera steady without a tripod.

8. Use a minimal crew. Wherever possible, move into the context of the place you are recording without fanfare or commotion. The smaller your working team, the more likely are your chances of recording the workings of a process with accuracy. Two persons are sufficient in most settings.

9. Become attuned to the tempo and rhythm of the process you are recording—let it direct your pace and prescribe your shots. Allow your camera to flow with the energy levels around you. Keep pace with the action.

10. Edit your tapes in the most straightforward way possible. Seek to assemble rather than to restructure the process you have recorded. Avoid voice-over narration or imposed sound effects.

11. Realize that the finished product may have poor lighting, hard-to-hear dialog, background noises, and occasional lapses in focus. These technical faults give video verité its freshness and sense of reality.

12. Playback your final product to its participants. Seek feedback and reactions on the completed version. Record this session using audio or video wherever possible, and maintain this as a record of the verité experience along with the final videotape.

# DIAL-A-CAREER

THOMAS J. JACOBSON
JOYCE HARDIN

In developing the Grossmont plan for career guidance and counseling, in 1974, a districtwide survey of student and parent information needs was taken. The results of the survey indicated clearly the need for an ongoing information system that could provide answers to commonly asked guidance questions.

Grossmont Union High School District, which borders San Diego on the east, is 50 miles long and 10 miles wide (80 x 16km). It is composed of nine comprehensive high schools and two continuation schools, enrolling 22,500 students in grades 9-12. In addition, 17,000 more students are enrolled in adult school classes. The district serves a population of approximately 270,000 people living in both urban and rural communities, and from a variety of economic groups.

To provide answers to guidance questions from both students and parents, an available communications system was sought that would support and complement the work of existing personnel, printed visual materials, and a computerized guidance information system.

Several criteria were established for selection of a system: (1) It must help answer frequently asked questions without using additional counselor and professional time. (2) It must be accessible to students and parents during nonschool hours. (3) It must provide current listings of information. (4) It must meet demands for new information by providing answers from experts. (5) It must answer questions correctly and uniformly, providing the same answer to students and parents districtwide. (6) It must increase the amount of communication with students and parents. (7) It must provide a way to make available information that students may be too timid to request. (8) It must protect the anonymity of the caller, allowing persons asking sensitive or embarrassing questions to avoid identifying themselves. (9) It must provide content that is accurate and current; therefore, it must allow for quick and easy change of content.

## Developing a Solution

The Grossmont district budgets a limited fund for innovative projects. These projects are funded for a one-year period only. They can be continued only after favorable evaluation and provisions for other funding. The search for a system, and the initiation of an ongoing guidance information service to students and parents, was supported by innovation project funds during its first year.

The search resulted in the selection of a Teletronix Information System (manufactured by United Recording Electronics Industries in North Hollywood, CA). Teletronix is a multichannel tape playback system that makes it possible for the student or parent, calling from home, to request an individually selected tape program and listen to it immediately on the telephone.

A list of the tapes available in the district's tape system is distributed to each student at school, and to each home via the adult school catalog, three times a year. Using the list, a student or parent dials one phone number to reach the Teletronix operator.

The caller requests a tape by title or number. The operator inserts the requested tape cartridge into the playback unit activated by the incoming call. The tape program plays to the caller, and at the same time automatically disconnects the operator so he or she can respond to other calls.

When the tape has played through to the end, it stops itself, disconnects the telephone line, and signals the operator that the cartridge can be removed. The tape is an endless loop and is therefore immediately ready to play again.

## Preparing Software

The system was initiated with presently available tape programs that would fit local needs and answer commonly asked questions. We determined that many useful programs were already available. An advisory committee was established to oversee the selection and development of content for the system. Establishing criteria for program development or selection has proved to be the most difficult problem in operating the program. As we moved into writing our own scripts, we established criteria for script development.

Finding competent writers, even among our faculty, has proved more difficult than we anticipated. There is some specialized skill involved in writing in concise outline form for use on audiotape. Much of the script writing has been done by counselors. Work experience coordinators have helped with scripts regarding their programs, vice-principals on curriculum or special subjects, nurses on health topics, and vocational education faculty on occupational courses. School psychologists are now becoming involved in preparing materials on specific student concerns and are in the process of developing tapes on the 35 most serious psychological concerns of district students.

About 35 preprepared tapes with custom endings were purchased from Teletronix. Over 40 new tapes were written and produced the first year. Another 40 are being produced during this second year of operation. The key to the success and effectiveness of this system is in involving faculty and students in development of materials that meet the specific information needs of our school.

### Location and Operation

The system has been located in an operating career center in one high school that serves students during the day and adults during the evening. No additional professional staff members were hired. The additional personnel cost to staff the system with a telephone operator has been only $2,000 per year.

The Teletronix switchboard is operated by students and career center aides on part-time schedules. The students receive credit for this work; the career center aides are paid by the hour.

### Financial Support

The telephone information system was supported for the first year by the district innovation fund. During subsequent years, it is being supported through ESEA Title IVB funds and the district guidance budget. Many other sources of future funding can be considered, since the system provides such a wide variety of information to a cross-section of the student and community population. Potential funding sources include (1) the Special Projects Act, Educational Amendments of 1974 (career, consumer, and community education); (2) Vocational Education Act; (3) NDEA, Title III; (4) Emergency School Aid Act; and (5) the Elementary and Secondary Education Act (ESEA), Titles I, II, III, and IVC.

### Promotion

To make the system work effectively, good initial publicity—and then sustained promotion—are required. When the system was first initiated, it received a great amount of free publicity in newspapers, on television, in school publications, and in PTA newsletters. Complete listings and instructions on how to use the system are now included in adult school catalogs. Announcements and listings can be sent to every home free of charge by arranging to enclose them in the water bills.

While these initial announcements are effective at the outset, as are time-to-time reminders, the most effective promotional tool is the student wallet pocket guide. This guide is provided to every student and can be folded to wallet size. It lists the single phone number, the hours of operation, and titles currently available.

Complete records of incoming calls to the system are maintained. They indicate that while there were high and low periods of usage in the early months, the frequency of calls has evened out, and the number of calls has increased as more tapes are added and as the system becomes better known.

### Second Year

During this second year of operation, system usage and evaluation will be developed further. (1) Approximately 40 new tapes will be added after a careful survey of student and faculty needs. (2) The style and format of the scripts will be varied in order to test the relative value of different formats. (3) The amount of publicity given the system will be increased, and a greater number of title lists will be distributed to students and parents. (4) We will continue to monitor calls for each taped program and analyze the patterns of response to the system.

# AN EXPERIMENTAL PROGRAM IN RADIO BROADCASTING

EDWARD G. MARTIN

For years, educators have been overlooking one of the most powerful motivational and instructional devices ever created. Most audiovisual hardware tends to stress the visual rather than the audio, so that film, slides, and projectors are usually preferred over records and tapes. Of course, the ultimate goal in the audiovisual plan is to combine both approaches to stimulate the eye and the ear in the attempt to communicate. However, we are neglecting an aspect of the audio media that can provide solutions to many problems facing the urban school in these times: RADIO.

It must be stressed that I am not referring to the radio programs produced for children by radio stations, nor am I referring to the groups of children sitting in a classroom listening to these radio shows. Both have their place in the educational system, however limited. What is referred to here is a means of providing intensive interaction between the student and the radio medium as *creator* rather than passive listener. With the stress toward relevance and a search for competency-based curriculum, one realizes immediately that the "hands-on" medium provides incredible educational opportunities.

During the past few years, an experimental program in radio broadcasting has been conducted in JHS 123X in the South Bronx area of New York City. It was planned, proposed, built and operated by Dennis Streem and me, two of the school's science teachers. The school itself is like many schools in the New York area: the pupils are lacking in reading skills and proper speech habits. They lack the self-confidence and social responsibility that is so necessary in today's world. Many of the pupils are wary of education and school. Their vocational future is unsure—their feeling of belonging practically nil. All of us are familiar with these children, for they are the ones who most need the services that AV can offer. For the most part, they lack the necessary communications skills needed for future productive lives. Into this situation, Mr. Streem and I mixed our backgrounds: a deep interest in science and its relation to society and concern for the social and educational development of our students; we both have had experience in the radio broadcasting field and hold FCC licenses. Most importantly, we sought to add a more meaningful and productive program to the existing curriculum. What resulted from this work is a program (the only one of its kind on the junior high school level) based upon an operating closed-circuit radio facility that has become a permanent part of our school's media resources.

Our original proposal, in June 1973, resulted in an allocation of $275 with which we were able to build a radio studio modeled after the actual facilities at modern stations. The studio includes two record turntables, two reel-to-reel tape recorders, a cartridge machine, two microphones, power supplies, a connecting "patch" panel, speakers, headphones, and a radio console with numerous cables and switches connecting the hardware.

The studio's low expense resulted from the use of materials on hand: the tape recorders were borrowed from the AV department; the tables were appropriated from the cafeteria and remodeled using the facilities of the woodworking shop. The metal shop allowed us to fabricate various covers and clamps, with the remainder of the equipment being purchased as components and reconnected for our purposes. Obviously, this requires some knowledge of electronics and radio, but most educational systems can easily find the expertise within their own staff for this procedure; all it takes is imagination and time. As a result of this work, a class of 25 students had the opportunity to gain insight into the functioning radio studio, develop necessary communications skills, and most important, learn how to work as a team in a meaningful experience. The motivation for reading and the acquisition of technical skills was noted to be high, especially in a district where most students have difficulty relating to school.

We have observed changes in shy, withdrawn students who might otherwise never attempt to read or experiment; even the so-called "behavioral problem" child responded well to the hands-on environment offered by the course. At times, volunteers from speech and reading departments offered their assistance to aid our announcers, disc jockeys, and newscasters.

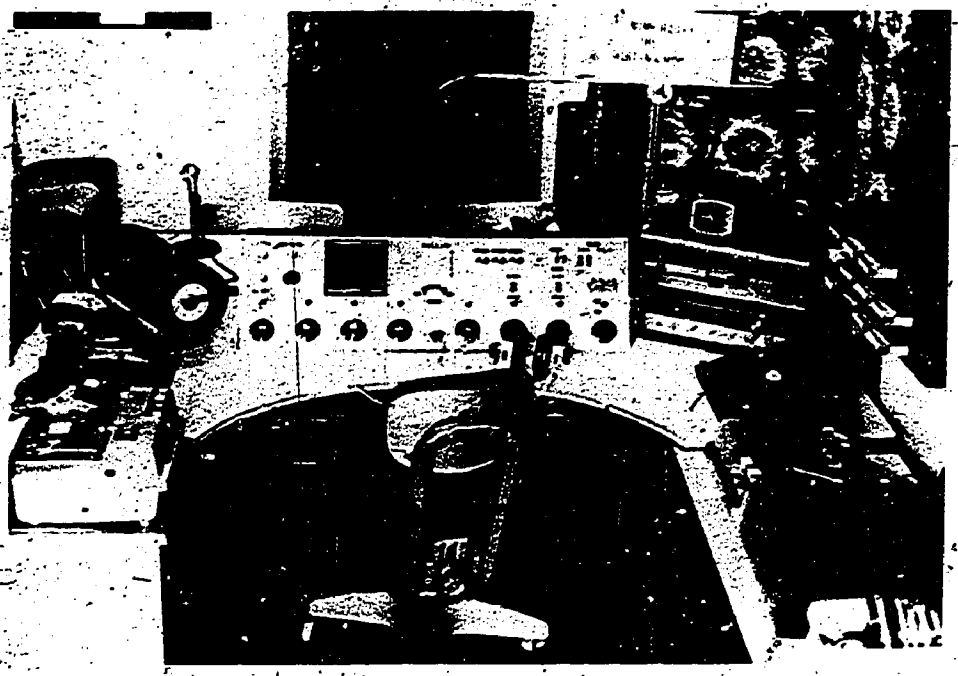
The instruction itself is informal and ranges from the lecture to student-teacher one-to-one interaction. Students work alone, in pairs, or in groups of five depending upon the type of skill they are exploring. Extensive use is made of the audio equipment with overhead projectors extremely useful for specific class instruction. We have attempted to include various teaching approaches in the class (since we are still in the process of experimentation) and find most benefit from the actual use of the equipment.

The program has been based mostly upon our own knowledge of radio, being modified, at times, with source materials from related books and magazines. A local library can easily supply the needed texts for student use and even those required by the teacher. The most helpful are included at the end of this article.

Of course, the main advantage

of this program is the student involvement with the audio equipment. The photograph below shows the radio console (control board) as it appears to the engineer. This board is capable of all the necessary techniques and switching required by modern radio, and the student learns how to perform each movement. Additional aspects of the program can be trips to actual radio stations in the community or visits by radio personnel. The studio can be linked by wire to the media center or to the main amplifier in the office for school broadcasts.

We are convinced of the power of the audio approach to audiovisual media. The low cost of such a program depends upon the imagination of the administrator or instructor. In our case, our students wrote letters to record companies who generously donated records to our station. Blank tapes were acquired from local radio stations, as were old news copy and commercials. Our audio control center, which contributed so much to student enthusiasm and skill, was fabricated mostly from existing school supplies. The advantages of this radio program and studio (once built) are too numerous to overlook: student-produced radio plays for English classes, soundtracks for social studies slide shows, auditorium functions taped for future school broadcast, a school news center, lunch hour programs, teacher-produced learning tapes produced in the studio for class use. All of these are simple outgrowths of the audio approach to media. The studio itself need not be any more complicated than a record player, microphone, and tape recorder which can then be connected to the school PA system for "broadcasting." The possibilities are as endless as your (or your students') imagination.



*Current WJMK studio with cartridge machine, turntables, reel-to-reel tape recorders, tape and record storage, and hand-built console.*

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# HOW TO PLAY "BRAIN DRAIN"

JAMES BLASZKIEWICZ

"Brain Drain" is a television quiz show produced and directed by staff members at J. L. Block Junior High School in East Chicago, IN. The closed-circuit television equipment is operated by junior high students at the school. The goals of "Brain Drain," which is the longest-running TV show at the school (five years), are to promote quick thinking, sharpen academic prowess, stimulate classroom discussion, and entertain.

The East Chicago school system employs a full-time instructional television specialist at Block. The specialist's job is to work out the technical details for television ideas developed by students and teachers. Those students who show an interest in television technology are given instruction by the specialist. This is done as an extracurricular activity according to programing needs. Students receive training on the use of the console, the use of cameras, the running of videotape recorders, the operation of audio equipment, and the proper use of lighting.

Besides running the television equipment, students are the participants in 20 consecutive half-hour videotapes. Each seventh- and eighth-grade advisory class chooses a team of three students. In this way, we have achieved direct participation of over 130 students each year. All students have a chance to participate either as members of the crew or as quiz show panelists. Teachers from all departments and students from all classes are encouraged to contribute questions for use on the show. There is an emphasis on total school involvement. Most questions are primarily of an academic nature, but some questions dealing with current events, sports, and general information also are used.

The procedure of the quiz show follows the same format weekly. The moderator, a faculty member is placed between the two seated competing teams and is responsible for posing questions and judging the correctness of answers. Two cameras are used during the taping: one focused on the moderator and one switching from team to team. The moderator is assisted by three off-camera helpers—a timer and two team scorers. Students, under supervision of the media specialist, cue theme music, set microphone levels, make camera adjustments, ready flip charts, and set proper lighting.

Before actual taping begins, the producer prepares the competing teams by going over the rules of the quiz game. There are two seventh-grade teams competing against each other as well as two eighth-grade teams. There is no competition between the two grade levels. Each team receives three minutes to answer as many questions as it can, with each correct answer worth ten points. The team that is behind after the first three-minute round receives an additional two minutes to answer questions and try to overtake the leading team. If the trailing team fails to catch up, the game is over. However, if it does go ahead, the team that led originally also receives two minutes to try to reestablish its dominance. Ties are played for one-minute sessions until a winner is determined. The quiz game is one of elimination: one loss drops a team from contention, while a win moves the team into the next round.

A public service commercial by the moderator allows for a transition from seventh-grade to eighth-grade quiz teams. The commercial's message runs the gamut from urging the student body to keep a neater school to promoting an upcoming science fair.

"Brain Drain" is taped on one day, either after school or during an activity period. It is then shown at three different times on the following school day. By showing the tape in three different time slots, it is hoped that most students will have the opportunity to view each program and see their peers, or themselves, competing academically. "Brain Drain" provides entertainment as well as serving an academic function. It is often used as an enrichment tool in the classroom to reinforce learned material and stimulate discussion regarding questions asked. Many teachers have mentioned that students in the classroom often become involved in the program, trying to answer the questions before the students on the show answer them.

Each member of the two first-place teams (seventh and eighth grades) receives an individual trophy. The second- and third-place team members receive certificates of merit.

# VIDEO POEMS: AN ABSTRACT USE FOR THE VIDEOTAPE RECORDER

THOMAS D. BRADLEY

Remember when as a child you could go into a clothing store, step up to a three-sided mirror, and swing the mirrors in to surround you? The result was an infinite number of reflections of oneself—each one smaller than the first with apparently no end to the number and depth of the multiple reflections. It is a fascinating experience for a child. If you have never experienced this phenomenon, then one day when a clothing store is quiet, steal your way into a three-mirror viewing area and try it!

This same phenomenon of an image apparently cast into infinity can easily and quickly give students a creative experience using a basic single-camera videotape recording system. The result will be interesting—visually abstract images, some of which are incredibly beautiful. Each effort will produce a totally new combination of images, so that like snowflakes, duplication is impossible.

To create this effect, you'll need a videotape recorder (VTR) set up in the conventional manner. Connect a closed-circuit television camera and the TV monitor to the VTR. However, instead of pointing the camera at an object or a person, focus the camera on the face of the TV monitor screen and then repicture it on the screen again and again. The composite of all these pictures gives an effect that does not in any way resemble the face of the TV monitor. Rather, unique images develop.

The images can be caused to pulsate, to flare up in a nova-type of effect, to spiral inward on themselves in a graceful curve, or to form a daisy-like flower that rotates, expands, and contracts. Some images become bolts of lightning; others become amoeba-like forms that spread across the tube.

You need to experiment with the VTR system to try to capture these effects on videotape. If the camera is equipped with a zoom lens, then any adjustment of the zoom will correspondingly affect the image that is being "looped" through the VTR system. The "f" stop of the lens also has a different effect on the image; so does the angle at which the camera is pointed at the television monitor face. Even physically turning the monitor on its side or upside down while the television camera follows the monitor's picture face results in startling images. If the VTR and/or camera is equipped with automatic light and video controls, vary the manual settings for more interesting results. If the videotape recorder is in the record mode, then these effects are recorded on tape so that they can be replayed.

Appropriate audio such as electronic music or sound effects can be added by using the audio dub mode on the videotape recorder. One effective use of voice over the visual can be produced if the voice is altered by being run through an echo box or a reverberation chamber. Both these electronic devices are commonly used by rock groups. Students who belong to these musical groups might agree to allow their equipment to be used in the school. If not, speech recorded in a ceramic-tiled room can sound very similar to the echo box technique. When the voice is mixed with music and sound effects, the combination can be quite impressive.

Titling and credits can be added to the program by placing the information in the center of a sheet of clear acetate with white lettering. The area covered by the lettering should be approximately the size of the surface of the television monitor's face. Be sure to use a large enough sheet of acetate to allow an ample border around the print. Place the graphics in front of the monitor and "shoot" the face of the monitor with the camera. You may find it necessary to light the graphics at an angle to keep light on the print but off the face of the TV tube. With a little experimentation, you can achieve a unique graphic for television.

Educators are constantly searching for tools to add to their teaching skills so that novel approaches can be used to stimulate learning. The area of language arts instruction can be given an added boost by using the described video technique. Have your students choose, or better yet, write a short poem. Perhaps they could write original Haiku poems. Any other literary form, poetic or prose, can be used, but a good suggestion might be to keep the selection short. This video technique does not lend itself to epic works! Students can choose video effects they feel best visually describe the poetry. Video collages of these varied effects can then be made to interpret or represent the poem they've written.

Literary efforts, whether poetry or prose, modern or classic, abstract or representational, when coupled with music, stylized graphics on acetate, and creative video images, can combine to allow the students to produce a one-of-a-kind presentation. These video poems can become personalized statements, unique to the individuals producing them. After the initial purchase of the VTR system, the cost is minimal, the creative potential is extremely high, and furthermore, it's downright fun!

Why don't you and your students try it?

# IN VIDEO, VERITAS

NAOMI LINDSTROM

Truth about one's own teaching performance seems to be about the most difficult type of truth to acquire. Teachers assemble an imaginary mosaic of themselves teaching a typical class on a typical day. But how truthful a representation is that mosaic? Where do the fragments that make up that mosaic image come from?

## Traditional Evaluation Techniques

In the past, teachers have relied on the "vibes" they receive from their classes, on written student evaluations, and on the advice of observers and supervisors. "Vibes" are the intuitive perceptions that send lecturers bounding back to their offices after class, flushed with victory, fantasizing about distinguished teaching awards and a host of disciples. Bad vibes can send lecturers slinking off in a cloud of gloom, counting the remaining class sessions as prisoners count the days of their sentences. The emotion with which a teacher leaves class is certainly an interesting phenomenon. As a way of assembling teachers' self-images, it must be rated "poor to unacceptable." Too many inexplicable factors enter into the picture: the amount of sunlight in the room, the class hour, the adrenaline the lecturer has dumped into his or her bloodstream while making a point.

Supervision, too, provides a limited source of information. As a supervisor, I know that informing teachers about how they teach is not my main goal. Particularly in large multisectioned courses, standardization and coordination of various sections is important. Checking for standardization may be a necessity, but it does not answer the question, "What is my teaching like?" Moreover, supervisors do not "know" in any absolute sense what teaching is best. I have found the same teacher characterized by four different observers as a pedagogical jewel, a dangerous incompetent, a mediocre nonentity, and a solid worker—all in the space of one semester. (It is probably a good thing that young teachers often disbelieve their supervisors' comments.

Student evaluations are in vogue, but again, one must question their descriptive value. Adolescent students are among the most eager and outspoken of judges, but few are skilled in characterizing good or bad teaching. Evaluations register contentment or dissatisfaction, but not the underlying causes. For example, a student might write, "This teaching assistant has a lot of problems. She should be more specific and less vague." Moreover, we all remember some course we detested but which we later realized had given us valuable material. At most, evaluations can provide mosaic tiles marked only with a plus or a minus—not a very well-nuanced portrait of the teacher as performer.

## Self-Observation A Necessity

The obvious solution would be to supplement the remarks of supervisors and students with one's own observations: to sneak quietly into the back row of one's classroom and see what really is going on between self and students.

The impossibility of self-observation has often made me despair of either supervision or of self-improvement. I would look for minutes at a student comment, such as, "She should try not to let the class feel that she is better informed about the subject than they are. But her knowledge is impressive." I would point out to a teacher I supervised that many minutes of the class hour went into convoluted grammatical explanations, and that teacher would reply, "No, little time was spent on grammar." Like every American, I wondered why technology had not yet resolved all the problems of the universe. Xerox could surely learn to duplicate teachers so that the original could observe the copy teaching, and vice versa. It was a cosmic injustice that teachers should be the people least able to get first-hand information about their own performances.

## Videotaping Performance

It was not Xerox but videotape that supplied the requisite technology. With relief and some queasiness, I discovered the teaching effectiveness center at my university was offering to tape teachers in their classrooms, to comment upon the taped performance, to teach supervisors to tape supervisees and supervisees to tape one another.

The teaching center has developed certain precautionary rules. No videotaped teacher could view his or her performance alone. Too many traumatized teachers had been found sitting in viewing rooms, paralyzed with disgust at their own classroom selves. Their trauma, moreover, was based on the most trivial features—a physical characteristic or typical gesture had caught their entire attention. To combat this bizarre human quirk, a teaching center employee had to sit at the taped person's side, directing interest away from misbuttoned shirts and fidgety thumbs to the larger issues of transmitting ideas and information. I agreed to be taped under these stipulations.

Walking to the classroom where the taping was to take place, I puzzled over the center's requirement that a consultant be present at viewings. Some strange dread must lurk in the medium—and, indeed, I felt none too calm at that moment. Just then I spotted a newspaper headline, "Video Setup Nabs Three in Dope Deal." While few teachers deal drugs in class, I think their fear of videotape is the horror felt by the video-caught contrabandists. We all fear we are doing something

horribly wrong in the classroom, and that the marauding video camera will "get the goods" on us. In some indefinable way, technological recording will multiply the gravity of our teaching defects. It is the same sort of logic that insists a camera can steal the souls of photographic subjects.

The anxiety generated by the taping process is second only to the nervousness of the teacher about to confront his or her taped self. Once the tape begins to unfold, the teacher is subjected to surprise after surprise. I had always imagined my teaching to be filled with long, awkward silences, during which failure hung heavy in the air. On the tape, though, silences were short and not oppressive. In fact, the teaching center consultant suggested giving students more time to formulate an answer—"Silence is a powerful motivator." The picture I had mentally assembled of my own classroom behavior was also subjected to quick revision. I had imagined a woman clinging to her lecture notes as a shipwrecked survivor grasps a plank. The tape showed a woman walking about, looking students in the eye, and only occasionally looking at notes.

In short, the mosaic of myself teaching that I had previously assembled from available information had not been an accurate picture. Because of the information I had been getting and using, I had spent a lot of effort solving imaginary problems such as long silences, a cold air of pedantry, and the absence of animation. Because I was not getting and using better information, I had not considered more pressing problems. For instance, I saw students who were not contributing to discussions, but who obviously could have done so if made to. Some students seemed continually on the verge of raising a hand to answer, but kept losing their courage. It dawned on me that students who seldom contributed could be called on by name without bringing about an embarrassing situation. At first I was afraid these recalcitrants were going to die of shame and ignorance, but they turned out to be just as able to respond as their braver classmates. Viewing the tapes made me see the to push more students to pate.

**Revelations Via Videotape**

It would be nice to say that all teachers felt as enlightened as I after viewing their tapes. Alas, for every person who leaves the viewing room with a light bulb glowing over his or her head, another leaves under a dark cloud of despair. Reactions vary wildly, but no one is indifferent. In each case, the disparity between one's painstakingly assembled self-imagination and the videotaped image is startling. Teachers who think they intimidate students find students intimidate them. Self-accused dawdlers see themselves dashing at top speed through their lectures. Everyone gets some shocking truth.

The worst reaction to taping I have heard of was witnessed by some of my tape-trained teaching assistants. A history professor had good-naturedly volunteered to be the object at which they could aim their novice cameras. Everything seemed to be going fine until the historian viewed the tapes. "I'm bald!" he started lamenting. "I never realized I was so bald! Why wouldn't my wife tell me!" The teaching assistants could not redirect his attention to matters more intimately related to successful teaching. Instead, they had to reassure him that he was really not so bald and that a bald man could also be impressive. Even the most sensible teachers can turn into obsessed men and women when they fix upon some detail of appearance or gesture.

Another typical reaction is consternation over the disparity between one's previously-acquired self-image and the tape. This disparity can help teachers redirect their remedial efforts. However, it can also turn into a trivial business. One teacher spent his entire viewing time noting in exhaustive detail all the points of difference between what he had pictured to himself and what he was seeing. These bits of information seemed to fascinate him for their number and variety, not as a basis for thinking about his future teaching. Again, attempts to move him toward a more productive reaction to his altered perceptions failed. Such instances make apparent the necessity of distinguishing between the important and the trivial.

My interest in videotaping arose because I wanted to get more truth about my teaching than could be assembled from other people's comments and feelings. I hoped that the immediacy and accessibility of the video image would occasion some form of confrontation with self. It seemed that in video, there would be *veritas*.

And was there?

The answer seems to be that everyone takes away from videotaping sessions some measure of truth. Even teachers who do not appear to be receptive get some kind of insight. The main drawback is that the truth gained is not always the truth most worth having. To catch a cosmic glimpse into the extent of one's baldness is hardly a worthwhile goal. On the other hand, to discover that one is not demanding enough of students is a productive insight that can benefit classroom sessions in the future.

How can videotape be made a source of self-revelation and not just a fault-finding magic mirror? One aid is the presence of a sane individual to guide the self-observer through the momentary madness generated by watching the tapes. The second determining factor is the approach of the person who is taped. A lot of people do not care to be told anything new about their teaching, not even when it is their own image that is doing the telling. They sit there, grimly assigning a minus or a plus to what they observe on the screen, and leave in a state of "that's that." The link between the session they have just observed and all the future sessions they will teach escapes them. "I was surprised to get off as lightly as I did," said one such observer, as if leaving the courtroom after sentencing.

It is hard to think of the videotape camera as merely a tool for getting information about teaching. To an excitable human teacher, it seems that Big Brother has come into the classroom. I get enough *veritas* out of my video sessions to plan to repeat the experience every semester, yet I have the same deep-seated dread of exposure by camera. Something urges me to "quit while you're ahead."

Given the unique power of videotape, there is no problem in presenting teachers with the truth about their teaching. The problem, given human reactions to video self-images, is how to make that truth assimilable and productive.

# TAPE-RECORD YOUR TEACHING: A STEP-BY-STEP APPROACH

SUE HAWKINS

*"I learned more from a tape recording I made of my class than I had in eighteen months of talking with my supervisor. After all, you can't very well debate with a tape recorder. It's all there on tape, the things you remember and the things you'd rather forget."—Comments of a sixth-grade teacher*

Along with this sixth-grade teacher are many others who believe that the tape recorder is invaluable in self-evaluation. In the last ten years, a lot has been written on the use of audiotape and videotape recording in teacher training. Both provide teachers with the opportunity to examine their teaching and experiment with new skills. Videotape recording has the advantage of letting teachers see as well as hear what happens in the classroom. But audiotape recording has some distinct advantages. Audiotape equipment is reasonably priced, easy to use, and generally unobtrusive. This last point, in particular, is important. Many teachers are hesitant to use a VTR setup because they feel its presence will disrupt students. In contrast, the sight of audiotape equipment is so common nowadays—in and out of the classroom—that it generally goes unnoticed. And, of course, the cost factor is also important. The relatively low price of good audiotape equipment compared with that of VTR equipment puts it within the range of almost every school.

For the teacher who's interested in self-evaluation, audiotape recording is an effective and inexpensive approach. But how should you go about planning it? Basically, there are seven steps you'll want to consider:

1. Identify the particular teaching skill (or set of skills) you want to observe.
2. Determine a specific strategy for observing those skills.
3. Select your equipment.
4. Schedule your taping session.
5. Set up for the session.
6. Tape a sample lesson.
7. Playback and analyze the recording.

Let's take a brief look at each of these steps.

### Identify the particular skill (or set of skills) you want to observe

This first step may seem to state the obvious. But the fact that this step is so basic makes it critical. You need to begin with a clear sense of your objectives. What specific skill or skills do you want to observe? If you try to observe too much at once, you risk being superficial. By narrowing your perspective, you can focus your energies more effectively.

### Determine a specific strategy for observing those skills

Once you've chosen your objectives, the next step is to determine a systematic way to accomplish them. For example, you might want to analyze your question-asking skills. One approach is to tape record a lesson that highlights these skills. An audiotape would certainly provide a lot of raw data on your behavior. But the raw data by itself is not enough. You need some way of organizing and understanding this data.

With this in mind, you may want to select an observation instrument to use when you listen to the tape. Very briefly, an observation instrument is a behavioral checklist. It helps you to identify and classify the types of classroom behavior that you hear on the tape. This knowledge provides a basis for analyzing your skills.

A number of such instruments already exists.[1] Each is designed to measure some aspect(s) of classroom behavior. It's up to you to find an instrument that matches your particular interests. (For a look at an instrument that's especially simple to use, see Figure 1.)

### Select your equipment

It's impossible to overemphasize this step. Whatever type of audiotape recorder you choose—cassette, cartridge, or reel-to-reel—it's important that you select your equipment carefully. Many teachers are reluctant to use audiotape equipment because they anticipate a number of technical problems. For the most part, these problems boil down to one basic problem—the microphone.

The microphone tends to be the weak link in an audiotape system. A number of manufacturers build poor quality microphones into otherwise good equipment. For many users, this may be acceptable. Nevertheless, for your purposes the microphone is critical. So be sure to check the microphone closely before you select a tape recorder.

You may also want to consider the use of additional pieces of equipment. One highly effective arrangement includes a wireless microphone and an FM tuner connected to a tape recorder.[2] A wireless microphone has a built-in FM transmitter. As you speak, the microphone converts your voice into electrical

[1] *You may want to look at* Mirrors for Behavior, *a six-volume anthology of classroom observation instruments. The anthology includes 26 instruments that represent a variety of approaches in the affective and cognitive domains. Simon, Anita, and Boyer, E. Gil, ed.* Mirrors for Behavior. *Philadelphia: Research for Better Schools, 1967.*

[2] *For a fascinating look at what can be done with this equipment, read* Wireless Observation *by John Herbert and John Swayze. (John Herbert and John Swayze,* Wireless Observation. *New York: Teachers College, Columbia University, 1964.)*

This observation instrument is designed to help teachers recognize a number of habits that interfere with their interaction with students. The instrument is reprinted with permission from Margaret Rector and Douglass Rector. *The Gift is Given.* Dunkirk, New York: Easttown Press, 1974.

1. "O.K." Your Count_____ Total_____
   Note: This phrase is much used by beginning teachers. It can be a weak and repetitious acceptance answer, or, worse yet, ask students to accept what is being said or done. Substitute other words, or praise!

2. "All Right" Count_____ Total_____
   Often overdone. Try for variety.

3. Other word repetitions, such as "Now," "Good", "Fine," or "Right."
   Which one? _____ Count_____ Total_____
   _____ Count_____ Total_____

4. Often-repeated mannerisms—facial, head, hand, or body—anything from hair-patting to grunts.
   Which one? _____ Count_____ Total_____
   _____ Count_____ Total_____

5. Repeating or rephrasing questions, usually a beginner's habit. This is a time-waster, and monotonous. Worse yet, it encourages inattention to the first question. *A good question is one that gets an answer!*
   Count_____ Total_____

6. Routine or regular repetition of student answers, for no purpose except to repeat. Don't count, in this total, answers that are repeated in order to PRAISE, or USE in teaching, in order to give indirect praise. ROUTINE AND REGUAR REPETITION OF STUDENT ANSWERS MAKES THE TEACHER THE SOLE FOCUS OF ATTENTION. IT DISCOURAGES STUDENTS FROM LISTENING TO EACH OTHER, REACTING TO EACH OTHER, OR VALUING EACH OTHER!
   Count_____ Total_____

7. Phrases such as, FOR *ME*, TO *ME*, or *I* WANT. If you say them because you want to, you are apparently trying to make yourself the center of the classroom universe. If you don't want this, WIPE THESE OUT. Say, instead, "For us," "For the group," or "For yourself," etc.
   Which? _____ Count_____ Total_____
   _____ Count_____ Total_____

8. Teacher interrupts, or brushes off, student response. Count any time this happens.
   Count_____ Total_____

9. Students interrupt each other, or the teacher. This is a student action, rather than a teacher action.
   Count_____ Total_____

10. Was any other annoying or repetitive habit missed? _____
    What was it?. Count_____ Total_____

Figure 1. *Sample Observation Instrument*

signals that are then transmitted. These signals are picked up by the tuner that has been set at the same frequency as the microphone. The tuner feeds these signals into the tape recorder where they are recorded on magnetic tape.

This arrangement has a number of advantages. If you ever felt that a microphone cord was chaining you to one spot, this setup is for you. In addition, the equipment is fairly accessible. Wireless microphones cost from $20 on up and represent a good investment for your school. FM tuners vary in price but are generally available. If it's necessary, you can substitute a battery-powered FM pocket radio for the tuner.

### Schedule your taping session

If you wait until a "normal" school day to do your taping, you may never get to it. Since you're the only one who will be listening to the tape, you should not feel pressured. Choose a particular lesson or class period that you know presents problems. If you have to worry about a microphone cord, you might choose a lesson that doesn't involve too much moving around. If you're using a wireless microphone, you won't have that problem. In fact, a wireless microphone was even used by a gym teacher while demonstrating exercises to her students!

As for your students, you know best how much advance warning they will need. You might even feel that it's better to wait until the day you tape to make your announcement.

### Setup for the session

Perhaps the single most important point to remember in setting up your equipment is the placement of the microphone. Generally, it's *not* a good idea to place the microphone in an open spot in the classroom (unless you want to hear a recording of books shuffling and papers rustling). With most microphones, the recording quality falls off dramatically as the distance between the audio source and the microphone increases. Consequently, you risk a garbled recording unless you stay rooted near the microphone. And even then, you would have to watch your head movements to avoid variations in volume.

There are several alternatives. The first and most obvious is for you to wear the microphone either around your neck or clipped to a belt or pocket. The principal drawback is that the length of the microphone cord determines your mobility. If this restriction doesn't prove too inconvenient, the technique should work well. And, of course, if you have a wireless microphone at your disposal, the problem is lessened.

### Tape a sample session

Make a few quick operational checks before you start taping. This is essential in any event, but particularly so when you are using a wireless microphone. If a local FM station is broadcasting on a frequency close to the one you've chosen, you may end up with a very

strange recording. The process of retuning your microphone and tuner is simple, and it's well worth the effort to check.

**Playback and analyze the recording**

The first couple of times you play back a tape, it is advisable to listen to no more than about 15 minutes. Those minutes will provide you with a great deal of information, and it will be easier to direct your energies than if you use a longer section.

There is no set procedure for listening to your tape. You may want to listen to it once for an overall impression of your skills, then a second time, using an observation instrument to gather more detailed information.

Whatever your approach, your tape should provide you with some interesting insight into a tremendously complex subject—your teaching.

# PUT A SHORTWAVE RADIO IN YOUR FOREIGN LANGUAGE CLASSROOM

SVEIN OKSENHOLT

The foreign language teacher who wants to bring live foreign language broadcasts directly into the classroom will find it useful to try shortwave listening (SWL).[1] Only some elementary knowledge of shortwave radio receivers and antenna construction is really necessary. Although there are over 3,000 shortwave stations in the world, we—the foreign language teachers—are interested in only about a dozen of them. This is for a variety of reasons, primarily relating to the wattage of the transmitter or perhaps the time of the day.

Of the 14 international and domestic shortwave bands, only two or three will be of use at a particular time of the year. Don't become awed by the magnitude of SWL options, because only a few of these programs are of sufficient quality for your students' use. Any local radio electronics firm should be happy to discuss with you the concepts of selectivity, sensitivity, and stability. If you plan to buy a shortwave radio for classroom use, members of an amateur high school or college club should be able to explain the audio significance of these terms.

## Wavelength

The numbers in Figure 1 should be learned by any teacher who wants to use the shortwave radio for program dubbing purposes. Daytime listening or dubbing should be limited to the higher frequencies. Dubbing can be done in the evening hours if you are listening on the 49, 41, 31, or 25 meter bands. Before dubbing any commercial programs of dramatic or literary content, be sure to check with the broadcasting station to avoid possible copyright violation.

**Figure 1**

| Meter Bands | 75, | 49, | 41, | 31, | 25, | 19, | 16, | 13, | 11 |
|---|---|---|---|---|---|---|---|---|---|
| Megaherz (frequency) | 3.9 | 6 | 7 | 9 | 11 | 15 | 17 | 21 | 25 |

## Antenna

One factor in achieving good reception of a shortwave program is the density and height of the ionosphere, which reflects radio waves back to the earth. Another important factor is the use of a professionally designed shortwave antenna. The antenna lead-in wires must also be appropriately shielded. I have successfully used the Mosely SWL-7 trap antenna kit in several schools for reception on the 11, 13, 16, 19, 25, 31, 41, and 49 meter bands. Any seasoned high school radio amateur could put this antenna kit together in less than an hour—and the price of the kit is quite reasonable.

## Advantages

Shortwave listening offers many advantages to the foreign language class.[2] (1) It provides practical information. (2) It is alive. (3) It is entertaining. (4) It represents an addition to the foreign language. (5) It has superior interest value. (6) Current events broadcasts contribute to the learning of a meaningful vocabulary. (7) It is the language used and heard by the natives. (8) The Gestalt image is kept intact. (9) Cultural tidbits are offered daily. (10) It provides a variety of intonations, expressions, linguistic phenomena, voices, subject matter, affective domain learning areas, novelties, achievement experiences, and curricular innovations.

## Techniques

The initial steps involved in putting together a meaningful unit of an individualized subject matter package include the following.[3] (1) Write a script of the broadcast you have taped. (2) Write out questions based on these recordings. (3) Write out the performance objectives of each learning unit of recorded material that has been supplied with a script. Make the description as simple as possible—although all four parts (purpose of the behavior, description of the behavior, the conditions under which they are to occur, and the criteria by which they are to be evaluated) should, if possible, be given. (4) Let the students read the script out loud. (5) Extract key (audio) sentences or phrases from the broadcast, let the students repeat them after the announcer, let them compare the differences in intonation, stress, pitch, etc. Use the pause button if needed to temporarily stop the tape. (6) Ask for synonyms or antonyms of the vocabulary found in the script. (7) Write brief dialogs using the script as source material. (8) Ask questions based on these dialogs. (9) Provide for a question-and-answer blackboard contest—boy-girl, left row-right row, etc.—to ascertain the champions of the day. Use the script and the recorded radio broadcast for reference.

## Testing

In spite of the fact that foreign

[1] Renee S. Disick, *Individualizing Language Instruction: Strategies and Methods*, 1975.

[2] Reichmann, E., ed., "Short-Wave Radio in Language Teaching," in *The Teaching of German*, 1970, pp. 304-306; Rivers, *The Psychologist and the Foreign Language Teacher*, 1964.

[3] Diesick and Valette, *Modern Language Classroom Techniques: A Handbook*, 1972.

language testing—or any other form of educational measurements for that matter—is not yet an exact science, we nevertheless have certain intrinsic opinions as to what good testing in a foreign language is all about.* (1) We want as many target language test items included as possible, and we do not want to rely too much on English-to-target-language exercises. (2) We would all like to use more graphic representations, pictures, dramatizations, paraphrasing in the target language, synonyms, antonyms, cognates, idioms, flashcards, journal cutouts, games, crossword puzzles, menus, and many other testing options. (3) Testing should deal more with principles of semantic knowledges and skills, and less with specific points of grammar enunciated in English. For example:

A. Write a + sign if the list of words have the same meaning and a ÷ sign if they are antonyms:
1. _____morning, evening
2. _____physician, doctor

**Basic SWL Frequencies**

| | |
|---|---|
| 13 Meter Band | 21,450 to 21,750kHz |
| 16 Meter Band | 17,700 to 17,900kHz |
| 19 Meter Band | 15,100 to 15,450kHz |
| 25 Meter Band | 11,700 to 11,975kHz |
| 31 Meter Band | 9,500 to 9,775kHz |
| 41 Meter Band | 7,100 to 7,300kHz |
| 49 Meter Band | 5,950 to 6,200kHz |
| 60 Meter Band | 4,750 to 5,060kHz |
| 90 Meter Band | 3,200 to 3,400kHz |

B. Underline the words that are associated in thoughts:
1. dentist, river, heart, letter, pain
2. piano, wine, play, week, horse

C. Underline the words that are antonyms:
1. small, fat, tall, skinny, old
2. answer, eat, die, ask, teach

D. Underline the words that any synonyms:
1. pretty, to be sure, red, attractive, blue
2. laugh, smile, get up, ski, run

E. Underline the words that would complete the sentence properly:
1. Six times six is (thirty-six) (sixty-three).
2. There are (seven) (seventeen) days in a week.

F. Which word is related in thought to the group of words at the left? Underline it.
1. dress, coat, shoes — cooking, dancing, clothing
2. snow, rain, hail — mountain, weather, wood

*Valette, *Modern Language Testing: A Handbook*, 1972; *German Quarterly*, January 1952, pp. 27-32.

## Annotated Bibliography

Burnell, Jerrold B., "How Shortwave Radios Can Improve Teaching Effectiveness," *Educational Technology* (October 1971), pp. 60-61

The shortwave radio is a useful tool that is not being taken advantage of in many school systems. The radio cost is under $400, thus making it feasible to buy for most schools. Journalism, music, history, and many other subjects might devote time to the use of the shortwave programs.

The value of the shortwave radio in the study of foreign languages is unmeasurable. Programs originating in foreign countries can familiarize students with phases they might never find in a textbook. Hearing the news and political opinions of another country can bring a student much closer to the language being studied. Since many of the more clear programs come through in the evenings, programs may be taped for later use in the classroom.

By contacting foreign language radio stations, teachers can get copies of the schedule for the month mailed to them ahead of time. Some of the AM stations in the larger cities of the United States may also be heard broadcasting foreign language programs. These programs are aimed at particular ethnic groups in the community.

Kirman, Joseph M., "Listen in on the World with a Shortwave Radio," *Teacher* (April 1973), pp. 69-72.

(1) Subtract the appropriate number of hours from Greenwich Mean Time (GMT) for your area. (2) Write to the embassies of the countries or local consulates for times and frequencies of the shortwave broadcasts that you may hear in your locality. (3) SWL automatically maintains current content information. (4) SWL requires little or no care.

Lally, Dale V., "Short Wave Receivers and the Foreign Language Teacher," *NALLD* (October 1971), pp. 37-42.

(1) Due attention must be given to the selection of the radio, log data, and possible class use of SWL. (2) The receiver should have AGC, RF, and AF controls. (3) Visit a surplus store for radio bargains. (4) See recent issues of popular electronic journals for listing of times and frequencies when programs are on the air. (5) Write, if necessary, to the embassies in Washington, DC. (6) At Marquette University, the Hammarlund HQ100 radio is being used. (7) Voice of America (VOA) broadcasts in German daily at 7:45 a.m. on 15MHz. (8) Radio Canada transmits German at 11:45 a.m. on almost the same frequency. (9) French may be heard throughout the day on Radio Canada. (10) Spanish is transmitted daily by VOA, Radio Mexico International, and Radio Havana on the 16MHz frequency. (11) Radio Mexico is on 9.705, 11.770, and 21.704MHz frequencies.

Mohr, William, and Dale Lally, "Teaching German via Shortwave Broadcasts," *Modern Language Journal*, Vol. 57 (1973), pp. 119-124.

(1) Reports on a summer school experiment in 1971 that included an SWL unit. (2) Unit goals were to enliven the curriculum, to bring contemporary speech and topical materials into the classroom, to integrate contemporary speech into grammar instruction, to train students to listen more attentively to spoken German in longer breath groups and various intonation patterns, to provide motivation to continue with German language study, and to instill a genuine feeling of confidence in the students in the comprehension and oral production of the language. (3) Sources used were Radio Canada, Voice of America, and the professor's taped recordings made when he visited Germany. (4) Radio Canada transmitted at 11:45 a.m. on 11.325, 17.820, and 21.595MHz with 10-minute newscasts. (5) Voice of America transmitted at 7:45 a.m. on 15.325MHz daily. (6) The topic of the first day was basketball and hockey (by chance!). (7)

**Terminology Used in Radio Transmission**

| *English* | *French* | *German* | *Spanish* |
|---|---|---|---|
| Frequency | Frequence | Frequenz | Frecuencia |
| Frequency band | Bande de frequence | Frequenzband | Banda de frecuencia |
| Kilocycle | Kilocycle | Kilohertz | Kilociclo |
| Listener | Auditeur | Hörer | Radio oyente |
| Program | Programme | Programm | Programa |
| Radio station | Radiodiffusion | Rundfunk | Radiodifusora |
| Shortwave | Onde courte | Kurzwelle | Onda corta |
| This (here) is | Ici | Hier ist | Aqui |
| Transmitter | Emetteur | Kurtzwellensender | Transmisora |
| Wave length | Longueur d'onde | Wellenlänge | Longitud de onda |

Grammatical topics extracted included indirect discourse, passive voice, and word order in dependent clauses. (8) Oral and written tests, quizzes, and dictations were used. (9) There was an enormous expansion of vocabulary, including such words as Verseuchung, Lohnforderungen, Schlupfwinkel, and Mondlandefahre. (10) In testing, the primary emphasis was oral, with question-and-answer, multiple choice, and dictation items. (11) It was recommended that all test questions be recorded so that the student may practice the answers ahead of time. (12) All students showed enthusiasm for the program. (13) It was recommended that the units be made short, with a maximum of 10 to 15 minutes per class hour.

Therien, Melvin G., "Learning French via Short Wave Radio and Periodicals," *French Review,* Vol. 46 (1973), pp. 1178-1183.

This article describes a program at Highland High School in St. Paul, MN, which received a $500 grant. The study of news in depth (analysis of French foreign policies, etc.) was rejected by the students. Other activities undertaken are listed here. (1) Write to the radio stations of the countries transmitting in French. (2) Sweep the frequency bands throughout the school day. The first day, 75 stations were logged in. (3) Concentrate on news, weather, sports results, etc., and don't tackle cultural programs of literary analysis. (4) Tape what you hear. (5) Watch out for impedance mismatch. (6) Duplicate enough tapes or cassettes so that each student has one. (7) Copy the script from the master tape—a very time-consu job. Ask local residents re native French to help you. (8) Duplicate the tape script. (9) Make a list of vocabulary and idioms recurring each day. (10) Use five minutes of tape for 50 minutes of class time initially. (11) After the recurring idioms are learned, a five-minute tape can be covered in a 30-minute class period. (12) The extra work for the teacher includes tape duplication, writing the script, duplicating, checking errors, testing and correcting, and planning new methods of using teaching material. (13) A round-table discussion should be used to conclude each unit.

Wood, Richard E., "Shortwave Radio as a Teaching Aid for German," *Unterrichtspraxis,* No. 1 (1972), pp. 36-41.

(1) Live shortwave radio in the target language provides a teaching aid of unsurpassed authenticity and directness, and remarkable student appeal. (2) It is important to differentiate between shortwave radio and amateur radio. (3) West Germany, East Germany, Austria, and Switzerland offer broadcasts in both German and English. (4) A radio should cover the 13, 16, 19, 25, 31, and 49 meter bands. (5) Evening broadcasts can be heard on the 25, 31, and 49 meter bands. (6) Deutsche Welle, from Cologne, transmits every evening from 5:00 p.m. to 11:10 p.m. (7) Use the 49 meter band during the winter months. (8) Österreichischer Rundfunk, from Vienna, transmits on 6,155kHz from 4:00 p.m. to 9:00 p.m. (9) Deusche Welle transmits on the 31 meter band on 9,565kHz at 5:00 p.m., on 9,605kHz at 7:00 p.m., and on 9,735kHz at 9:00 p.m. (10) In the summer months, use the 25 meter band on 11,795kHz. (11) Deusche Welle, from the Kigali relay station in Rwanda, Central Africa, is on the 16, 19, and 25 meter bands during the day. (12) Write to Deusche Welle, D-5 Köln I, Postfach 100 444, to have your name put on their mailing list for program schedules. (13) Sackville, New Brunswick, relays from 7:00 p.m. to 9:10 p.m. on 11,865kHz on the 25 meter band year round, and on 15,665kHz on the 19 meter band during the summer months. (14) Austria broadcasts on 9,770kHz on the 31 meter band. (15) Switzerland broadcasts on 9,535kHz on the 31 meter band. (16) Radio Berlin International, from East Germany, transmits on 5,955kHz and 9,730kHz. (17) Deusche Welle has "kurznachrichten" at 6:00 p.m., 8:00 p.m., and 10:00 p.m. (18) Beginning German students can listen to "Lernt Deutsch bei der deutschen Welle" at 6:30 p.m. and 9:30 p.m. on the 31 and 49 meter bands. (19) Radio Canada International, from Montreal, transmits from 10:45 a.m. to 11:15 a.m. on the 13, 16, and 19 meter bands, on 21,595kHz, 17,820kHz, and 15,325kHz. (20) BBC, London, transmits throughout the day. (21) HCJB, "Die Stimme der Anden," from Quito, Ecuador N.B. comes in loud and clear every night. (22) Radio Moscow. (23) Radio Japan broadcasts at 10:00 a.m. on 17,825kHz and 21,535kHz daily. (24) Radio Peking. (25) Radio Cairo. (26) Before you buy a radio, please consult with a person who knows something about SWL. (27) For proper antenna construction, write to Deusche Welle or the BBC for a brochure. (28) Record only those broadcasts that come in loud and clear. (29) The professional radio announcer speaking his native tongue is the ideal target language model for the students at any level.

# ROUND-THE-CLOCK CAI HELPS TEACH COMPUTER WORKERS AT CENSUS BUREAU

KAREN HOPE DEFAZIO

*In 1790, the first official count of Americans turned up slightly less than four million—which is to say, something under half the number of people who lived in the New York metropolitan area in 1974.*

*When the Bureau of the Census begins its 20th decennial count, in 1980, it will take a lot more than battalions of head-counters to gather the many kinds of data now needed. And so, the Bureau of the Census is turning to the latest methods of counting—and of teaching people how to do it.*

A major effort is underway to develop a computer-assisted instruction (CAI) system within the Census Bureau in Washington, D.C., one of the largest data collection and data processing organizations in the world. It employs over 400 people just to operate and maintain the computing equipment used in processing Census jobs.

Responsibility for training computer operations personnel and the 300 programers employed in the Bureau is in the Training Branch, located in the Systems Software Division. The Training Branch consists of four full-time programing instructors, four full-time nonprograming instructors who train those who operate the computers, and the newly created CAI Section.

## Bureau Training Needs

The Census Bureau has numerous training needs in the computer operations area, many of them critical. New employees must be trained to operate equipment. Because computers can become obsolete after as little as five years, new equipment and peripherals are constantly being acquired, and enhancements and modifications are often made on existing equipment. People must be trained to operate this new or improved equipment.

Furthermore, computer operators work three nonrotating shifts, which means that training classes must be conducted during all three shifts. The burden on the four nonprograming instructors, who must teach as many as 15 courses per semester to each of the three shifts, is obvious.

Prospective programers have special training needs. New employees must learn the computer languages used at the Bureau, some of which have been modified to fit specific Bureau requirements. It is difficult, if not impossible, to learn these languages through on-the-job training.

Beyond these immediate needs are the learning and implementing of new techniques that are constantly being developed in the computing field. These are taught in continuing education courses conducted on a semester basis much like a college curriculum.

## How CAI Can Help

Investigation led to the conclusion that computer-assisted instruction would help meet many training needs. One hope was that CAI, which utilizes a computer, a curriculum developed for or adapted to the computer, and a termipal through which the student interacts with the system, might reduce the wear and tear on the four instructors of nonpregraming employees.

Although CAI is often considered not to be cost-effective, minimal investment was needed in this case. Since the Census Bureau processes most of its data on a configuration of three UNIVAC 1108's and one UNIVAC 1110, only a few rental terminals were needed.

The generally recognized advantages of CAI also entered into its selection as an instructional method. Students learn at their individual rates, neither rushed nor delayed by other students; students are active in the learning situation and receive immediate feedback as to whether responses are correct or incorrect and why. Also, students may be branched to remedial or in-depth instruction according to needs or desires.

## Cooperative Effort

Because the Bureau was already using a configuration of UNIVAC computers and because UNIVAC was actively involved in CAI, that company was selected to support the CAI effort at Census. The one CAI terminal UNIVAC was supporting at that time, the Uniscope-100, was found to be adequate for our needs.

UNIVAC chose the Census Bureau as one of three test sites for the initial implementation of ASET (Author System for Education and Training). This new CAI language, developed by UNIVAC, combines and greatly enhances the features of their earlier languages. Under this cooperative effort, computer software for ASET would be provided without charge in exchange for help in debugging the language.

## Development of CAI Training

Since its creation, the CAI Section of the Training Branch has been headed by John Luther; it now consists of two educators and a computer engineer. Their major responsibility is course development and evaluation. Lesser responsibilities include training other instructors and assisting them in course design, CAI strategy and coding, and evaluation.

The first CAI effort was directed toward computer operations personnel—the people who run the computers. Their job situation adapted particularly well to CAI. The first course addressed computer console operation in general, with emphasis on difficult situations that can develop during the processing of Census data (production runs), which comprise the bulk of daily work,

and the procedures for overcoming them. Course format combined console simulation, questions concerning the choices available, and analysis of answers and keyins (the responses to messages or actions of the computer). Some exercises required only a keyin; others required students to answer a series of questions based on a simulated console situation. Each answer led either to a new question or to the presentation of new data from which to make further decisions and responses. (Simulation can be done quite effectively on a Uniscope-100 terminal, for both the Uniscope and the computer console are equipped with cathode ray tube (CRT) display screens.)

## The Future of CAI at the Bureau

When the course is completed, it will be presented to a test population to determine whether the lesson is coherent and understandable and if everything functions smoothly. Revisions can be made in the course if difficulties are encountered. After students take a course, the ASET language can supply the instructor with progress reports, final reports, student answer and branching patterns—all the data needed for instructional planning.

It is anticipated that CAI courses will be developed for use during the 1980 Decennial Census. Programing courses will be partially converted to CAI. Eventually, additional media will be used with the CRT display screen of the CAI terminal. Slides, microfiche, videotapes, audiotapes, and graphics display terminals can be used in conjunction with this terminal. The future of computer-assisted instruction at the Census Bureau seems assured.

# INTERCONNECTIONS FOR LEARNING

# PROJECT INTERCHANGE: A COMMUNICATIONS SATELLITE TEACHER TELECONFERENCING EXPERIMENT

DAVID GREEN
WILLIAM LAZARUS

Project Interchange was conceived as an experiment that would devise alternatives for disseminating educational innovations through the National Diffusion Network.

The initial planning assumed that classroom teachers could suggest innovations to which the network could respond. Following funding[1] in the summer of 1975, planning began with a series of conferences among a number of groups:

- teachers in the Torrance Unified School District, California, and in the parochial schools of the Archdiocese of San Francisco with
- experts in the office of the superintendent of schools in Santa Clara County and in the office of the state education facilitator at Chico State University.

Then in late 1975 teacher-coordinators from the two school districts involved selected "key teachers" who had demonstrated interest in and experience with personalized education.

In February 1976, the key teachers, project staff, evaluators, and expert resource people met to become acquainted and to make final decisions about topics raised at the planning meetings. After simulated teleconferences with key teachers and project staff, each region began to plan its own local simulation broadcasts.

In this way, teachers became familiar and comfortable with the emerging technology of satellite teleconferencing. During their teleconferences teachers had shared experiences, ideas, questions, and strategies on such issues as "Motivating the Passive/Reluctant Learner," and "Peer and Cross-Age Tutoring."

In March and April 1976, the regions held from one to three simulated teleconferences. These simulations, observed and commented on by the outside evaluators, were of great value in refining teachers' teleconferencing techniques. More important, the key teachers began to take control of the project in the simulation phase and to shape the future satellite broadcasts so that they would meet their needs. The teachers learned in this phase, for example, that outside authorities often became authority figures who impeded, rather than facilitated, interchange among teachers. When the actual teleconferences took place, such outside authorities played only small roles.

Although planning for the actual teleconferences had begun in early 1976, final preparations could not be completed until data from the simulation broadcasts were in. The satellite was launched in January, tested and positioned in February, and eclipsed in March and April. That left May for programing. Although teachers have a hectic schedule in May (the end of the school year), three full interchanges were scheduled for May 10, 14, and 19, 1976. Many other interested teachers watched the interchanges and participated by passing their comments and questions through the local key teachers. All key teachers and project staff participated in an evaluation broadcast on May 21. The Project Interchange Consortium Committee also held one of its regular meetings via satellite on May 26.

## Technical Design of the Project

Programs originate from the Educational Television Center in Menlo Park; the studios of the Archdiocese of San Francisco. The color production facilities there include a studio, recording and editing equipment, two-camera or single-camera remote capabilities, and graphics and darkroom facilities. Any production can be transmitted live as well as recorded.

The television material for CTS broadcasts originates at the ETV Center in Menlo Park. The ITFS signal is transmitted from Menlo Park and is received at the NASA Ames Research Center (ARC) at Moffett Field, California, under the terms of an agreement with ARC for using its ground transmitter. The received signal is down-converted into baseband video and audio channels and is interfaced with the ARC transmitter system. The ARC transmitter output power can be adjusted to saturate the 200-watt CTS power tube.

The CTS satellite relays the programs to receivers in San Francisco, Los Angeles, and Chico where the signal is interfaced with existing ITFS systems and CCTV systems and so transmitted to schools.

In discussions with previous satellite users, it was learned that it was necessary to overcome the delay of approximately half a second caused by the satellite transmission. In a remote location, speakers are confused when they experience a delay in hearing their voices come back on the television speaker.

In cooperation with the telephone company, a standard push-to-talk handset was used with a separate audio line connected from the telephone to the television speaker. Thus, while the telephone is off the hook during an interchange, the person wishing to ask a question picks up the handset and pushes the button. This simultaneously activates the mouthpiece microphone and mutes the television speaker. When the teacher completes the question, he or she releases the but-

[1]Funds for Project Interchange came from Title III, Dissemination of Educational Innovations, Elementary-Secondary Education Act (ESEA). The Legal Education Agency was the Santa Clara County Superintendent of Schools. Technical support came from National Aeronautics and Space Administration (NASA) headquarters, NASA/Ames Research Center in Mountain View, California; Westinghouse Corporation; the Public Service Satellite Consortium (PSSC); and the Veterans Administration. The NASA-accepted experimenter was the Archdiocese of San

ton and hears the response over the television set speaker.

Feedback facilities are important features enabling teachers in schools to exchange information, ask and answer questions, and even present graphs, drawings, and other materials during a program's discussion period. Responses from teachers hundreds of miles apart are relayed via telephone lines.

Teachers' comments are channeled via the telephone line through the Educational Television Center in Menlo Park to NASA's sending facility and beamed by satellite to all participants in the network. Teachers do not have to convene in a central place in their school system for the programs; they can stay at their schools and participate through their existing television distribution system.

Several audio return systems were considered during the planning stages, but budget limitations required an inexpensive yet functional system. In coordination with the telephone company, it was found that the least expensive and most effective system would use a standard telephone in the viewing locations. The schools in each major viewing area call a local number. These local calls are "mixed" with an audio mixer and the output becomes *one* long distance call to the Menlo Park Studio.

### Evaluation: Objectives One, Two

Program and technical models for live teacher-to-teacher interchange via the Communications Technology Satellite and landline systems were developed and proved very successful. Teachers communicated among themselves and with the project staff in the studio and, by the end of the CTS broadcasts, were telling the project staff what content they needed and how they wanted it presented during the satellite broadcasts.

They were doing this from Torrance (Los Angeles County, California), to Chico (Butte County, California), and to the key teachers and project staff in the San Francisco Bay Area and back again. Their attitudes toward the project staff and the use of CTS achieved and stayed at a high positive level. They preferred teacher-to-teacher dialogue over formal presentations by an expert or experts on a given topic. By the end of the third interchange, teachers felt comfortable and in control of the system.

### Evaluation: Objective Three

The technical support system of Project Interchange has worked very well. There were a few minor initial problems (for example, television sets not working or two or more teachers talking at once) but these were corrected by the time of the final broadcasts. The teachers are interested in adding to the telecommunications system the capacity to participate in telephone or computer conferences between the satellite broadcasts.

Telephone conferences have been held on a regional basis and can be conducted on a statewide basis at the necessary high-grade level by using a simple system-design change developed by one of the project engineers. Computer conferences are also possible as Project Interchange is a participant in the NASA PLANET computer teleconferencing network and, by locating additional terminals in the schools, key teachers could expand this method of teacher-to-teacher interchange.

### Evaluation: Objective Four

A project management plan was designed and carried out. This plan included selecting (by competitive affirmative-action bidding) two external evaluators for the project. Their formative evaluations played a significant role in the direction and

## Background of the Project

In the past 10 years there have been great advances in satellite communications technology. The advent of synchronous orbiting satellites and the development of small, reliable, high-powered devices such as NASA's ATS-6 have put communication via satellite within reach of educators.

The Communications Technology Satellite (CTS), a joint Canadian-American venture designed to reach small, low-cost, user-operated ground terminals in the 12 GHz band, is the newest and most advanced of these satellites.

Since 1969 it has been NASA's policy to encourage worthwhile public-interest experimentation on its ATS-series satellites. In 1974-75, for example, dozens of experiments were carried out on ATS-6 in Appalachia (teacher in-service) and the Rocky Mountain states (career education). NASA provides satellite time and exercises satellite command and control functions according to a schedule set up by NASA and the satellite users. A user organization is responsible for providing resources to develop, operate, and evaluate its experiments. NASA does not fund user activity.

In August, 1974 a consortium of California school districts submitted a plan entitled "Project Interchange" to NASA. The plan envisaged using CTS to:

- develop a model for live interchange about common or persistent problems in individualizing instruction by geographically separated classroom teachers;
- generate "teacher specifications" for future development of technological support systems;
- plan, use, and evaluate the effectiveness of the technological-support systems of the project; and
- evaluate and report activities and outcomes of the project.

All three members of the consortium shared a longstanding and firm commitment to: (1) teacher and staff development; (2) systematic development of individualized instruction; and (3) cost-effective application of electronic technologies (computers and television, for example).

Moreover, two school districts (the Archdiocese of San Francisco and Torrance Unified) operated fixed-service instructional television stations. It was the project's further intent to experiment in interfacing satellites and existing ground-distribution systems.

The consortium members believed that a satellite-based demonstration would help overcome teacher isolation while accelerating the development of teacher attitudes and competencies needed for implementing individualized instruction that would be supported by electronic communications.

On November 29, 1974, after a review of "Project Interchange" by the NASA CTS Proposal Evaluation Committee, the experiment was approved for inclusion in the CTS Communication User Experiments as Experiment #16.

outcomes of the project.

The project was operated with minimum staff size and facilities. There were very limited funds for the part-time staff, and the participating agencies donated use of their facilities. Of the $145,000 total budget received, approximately $45,000 went for CTS receivers, related equipment, telephone service costs, and overhead to the Legal Education Agency. At the beginning of the project's search for funds, one agency director in Washington, D.C. who was knowledgeable about satellites said the project couldn't be done for less than $1,000,000. It *was* done and, because of staff and teacher dedication, done rather well for much less than that amount.

**Continuing Activities**

The second phase of Project Interchange took place in May and June of 1977. The content focus of Phase II was special education with an emphasis on integrating the learning disabled child into the regular classroom. This portion of the project was entirely funded by the participating districts and consequently was limited in staff and number of conferences. The two teleconferences of Phase II—one among the Phase I key teachers and another between project staff and participants in a conference on Satellites in Special Education held at the University of Kentucky—were both highly successful.

A third phase of the project saw the consortium grow and the funding base change. Project Interchange became the Special Education Satellite Project (SESP). From October 1977 to March 1978, funded by a grant from the National Institute of Education, the consortium (the Council for Exceptional Children, the University of Kentucky and the Educational Television Center) planned a four-year project to use telecommunications technologies, especially satellite, to promote implementation of PL 94-142 the Education of All Handicapped Children Act. The SESP plan envisions using computer and video conferencing for the delivery of teacher education and technical assistance to school districts as well as the direct delivery of services and information to handicapped children and their parents. The SESP Consortium is currently awaiting operational funding from NIE.

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# THE LONELINESS OF THE LONG-DISTANCE LEARNER

SIVASAILAM THIAGARAJAN

This article is about adult education via ITV and radio. However, its emphasis is not on the technology of telecommunication. Instead, it deals with a problem that Diane Dormant has labeled "the loneliness of the long-distance learner."

My experiences with functional literacy through radio in developing nations, and esoteric enrichment through television in the developed nations, reveal a common factor among all consumers of mass education: they are lonely. In an attempt to avoid the inefficiencies of the conventional classroom, telecommunication has also thrown away the hidden strengths of traditional educational systems. The engineers have consistently disregarded feedback from the field and gone about creating solutions for nonexistent problems. If MPATI (Midwest Project on Airborne Televised Instruction), with an airplane that flew thousands of feet in the sky and bounced back the broadcast, was a failure, then these telecommunication technologists have created an ATS-F (Applied Technology Satellite-F) to orbit thousands of miles in space to do just about the same thing. Producers of the educational message have not done any better, either. Basing the decision on body counts, they have concocted cute gimmicks against channel-switching. As a result, we have adult *Sesame Streets* that turn off the serious learner and patronize the public at their lowest common denominator. Some notable attempts provide a support system for students enrolled for credit. However, much more has to be done.

## Two Faces of Learner Loneliness

Adult learners who watch educational television programs complain about two types of human interaction that they miss: (1) reassurances and reinforcement from an instructor, and (2) misery-sharing and mutual learning with their peers. (Curiously enough, very few children make similar complaints about their educational television. This is probably because they frequently watch the programs in groups, or they have not acquired the need for interactive instruction, or they are much more easily attracted by the intrinsic interest-value of the medium, or all of the above.)

So what if the learner is lonely? We are in the educational business and not in the organizational business. I am not pleading for a reduction of learner loneliness in order to sound humanistic, but to provide cost-effective, remote-control curriculums. Because the learner misses the instructor, she or he is likely to miss the confidence, clarification, comfort, and commitment of a conventional classroom.

*Confidence.* Praise and personal feedback from an authority figure do wonders for the student's self-image. A mature student may not need such feedback, but this type of student rarely needs education through telecommunication.

*Clarification.* Not even the most experienced instructional developer can anticipate all the different ways in which learners get confused. A single, simple misunderstanding early in any learning process can frustrate the student for a long time. An instructor can efficiently and effectively unblock the learning process through a brief individualized remedial instruction.

*Comfort.* Even if a student never has occasion to use tutorial contacts with the teacher, it is reassuring to know that someone is available in case of instructional emergencies.

*Commitment.* If all instructional interactions were confined between the learner and the tube, even the highly-motivated person would postpone his or her assignments to pursue other distractors. Commitment to another human being—to the instructor—helps the learner take the instructional tasks seriously.

Because the learner misses the peers, she or he is likely to miss the companionship, comparison, collaboration, and competition of a conventional classroom.

*Companionship.* Misery (and joy) loves company. In a classroom, the learner can share his or her depressions and delights with others and find camaraderie in a common pursuit.

*Comparisons.* In spite of the virtues of criterion-referenced testing, most human learners need to locate themselves in a norm-referenced space. Knowing how one's performance compares with that of one's peers is not a neurotic obsession but an essential element in acquiring a more realistic self-concept.

*Collaboration.* Even without a formal peer-tutoring program, considerable collaborative learning takes place in any group of students. Talking to each other in a classroom frequently results in gaining mutual insights and clarifications. Often students help each other more efficiently than an instructor can because they share a common language and learning.

*Competition.* An optimum level of competition creates powerful motivation for learning. Attempting to do better than the other learner as an individual, or the other class as a team, has been one of the hidden strengths of conventional classrooms.

## Reducing Isolation in Learning

How can we reduce the loneliness of the long-distance learner and recapture the hidden assets of the classroom? This is not a simple problem with a single answer. However, the solution seems to lie in the

direction of reassuring the learner that personal contacts are possible with an interested instructor and communal companions. This tone can be built into the instructional program during its design, development, and revision; it can be added on during dissemination and utilization.

## Desirable Design Techniques

*Using a credible instructor.* The televised course has to be associated with an affective, authoritative figure. Few authoritative figures project a personal touch; and if we can identify a charismatic content specialist, there is no need to hide her or his face. We do not want a continuous talking face, but we also do not want interminable, impersonal voice-overs.

*Featuring friendly feedback.* Effective instruction requires active learner response and appropriate feedback. Friendly instruction suggests that such feedback be in terms of how other learners' have done. Rather than showing the correct response from a master performer, it is more desirable to show a number of average responses from typical learners.

*Designing discussions and debates.* A useful device for handling unanticipated learner problems and increasing the visibility of other learners is to follow up each televised lesson with a spontaneous discussion among typical learners. If these learners are unable to reconcile any major differences, the host-instructor may intervene.

*Planning formative evaluation.* Most televised instruction undergoes formative evaluation and revision of the content and the format. However, such evaluation seldom takes into account any aspect of the delivery system. Consequently, the effective learning of the tryout subjects (who have the undivided attention of many people) is seldom replicated in remote-learning situations. Truly functional formative evaluation requires the addition of typical-use testing where the problems of the forlorn learner are identified and attended to.

## Useful Utilization Techniques

*Bringing out the big brother.* Each individual learner working through a televised course should have the option of personal contact with an instructor. Such contact can be maintained in a variety of ways: (1) The British Open University reputedly supports a large part of the national postal system so that no enrolled learner is ever lonely. Guidance and feedback letters have a number of advantages, but mail is slow and form-letters are impersonal. (2) Cassette tapes permit conversational feedback with a greater degree of intimacy. However, they do not permit real-time dialogues. (3) Telephone technology, with its toll-free lines, permits the instructor and learner to talk at regular, prescheduled times and during emergencies. Whenever the learner is baffled or the instructor is curious, it becomes possible to contact each other personally over the telephone. (4) A local learning resources center with an instructor/monitor permits all of the preceding techniques with the added option of face-to-face meetings.

*Facilitating friendships with fellow learners.* Here are some utilization techniques that ensure interaction among learners: (1) The course may begin with a local orientation meeting during which past and present learners can get acquainted with each other. The delivery system can also provide periodic; updated lists of learners. (2) The design of the televised lessons (and of adjunct study guides) can strongly encourage and support team learning. Instruction can be structured to utilize functional aspects of peer tutoring and personalized systems of instruction (PSI). (3) Follow-up activities can encourage the learners to share and apply their skills and knowledge with friends and colleagues. For example, simulation games and discussion guides can facilitate such sharing.

## Mass Education by the Masses

Telecommunication technology for mass education is not merely the hardware, nor even the courseware, but a complete system with human faces. Reducing the learning unit to the individual learner may be instructionally efficient in the short term, but may not be motivationally effective in the long run. Suggestions for bringing back the talking face and the heterogenous group may appear to be as anachronistic as the horse cavalry. However, we are not able to use even a small portion of the sophisticated hardware and the innovative instruction when very few people enroll in our broadcast courses. Maybe it is time to experiment with dissemination and bringing back the people.

# TELENETWORK CALLING

KENNETH L. KING
FRED A. TEAGUE

Although telelectures have been used for more than 25 years in business and industry, only within the last decade have educators put them to extensive practical use. The telelecture traditionally has used long-distance telephone service attached to amplifying equipment. This transmits an instructor's remarks from one location to several interconnected classrooms, generally located great distances from one another. Now, with both capabilities and convenience increasing, many states are using this medium to bring nationally and internationally known experts to classrooms.

The Kansas Regents Network has initiated some innovative concepts in this form of teaching by telephone. It began with the development of a telenetwork by Kansas State University about eight years ago. At that time, educators were searching for a method of extending the university's educational experiences to remote, rural locations. The mediums of television and radio were explored, with the economics of each considered from several viewpoints. It was concluded that the telenetwork offered possibilities lacking in both radio and television. First, the cost of the equipment was approximately one percent of that for television equipment. Second, the telenetwork permitted two-way communication, which was lacking in both television and radio. The telenetwork also allowed the economic use of talented and qualified persons. Information could be disseminated to a vast audience at one time without having to travel from place to place. Perhaps the most important attributes of the telenetwork were the time and human resources conserved, along with substantial savings in energy consumption.

Many other states have telephone-assisted systems, but none operates exactly like the Kansas Regents Network. For example, Gerald McKay wrote that the network at the University of Minnesota-Minneapolis utilized amplification through a radio broadcast console, with extension meetings held on general community information topics. And at Dover High School in New Jersey, two social studies teachers, Raymond Schwartz and Richard McNeely, used a telelecture system to communicate ideas, questions, and opinions between the classroom and major political personalities of our nation.

In the spring of 1970, Kansas State University began its pilot program of providing instruction via telephone lines to students located 250 miles (400km) from the campus. The first equipment used was extremely large and cumbersome. It consisted of two components with a combined weight of about 180 pounds (81kg). However, the size and weight were not the only undesirable features: the quality of sound produced was not at all desirable for an educational classroom setting. Modifications were made throughout the semester to improve the equipment.

At the end of the first semester of experimentation the sponsors of the project, the university's division of continuing education, analyzed the data. They concluded that the telenetwork had considerable potential in the field of education and decided to explore additional possibilities.

During the summer of 1970, two telenetwork lines were combined in two locations for simultaneous operation. Each location was approximately 270 miles (432km) from the university, and the two were 107 miles (171km) apart. Courses with academic credit were included in the offering. Newly installed telewriters were used to provide a visual written format in addition to the audio equipment. The telewriter, a Victor Electro-writer, provided a large projection stage on which the instructor could write comments or draw illustrations. These symbols were transmitted over the telephone lines. Another important capability of the system was that both written and verbal communication could be tape recorded for later use.

The revamped audio equipment was connected by WATS lines (Wide Area Telecommunication Service). The newer equipment had a greater degree of portability, since it was only half the size of the original equipment. However, the quality of the audio reproduction was still not entirely satisfactory. Considerable noise interference persisted, but this was attributable to the WATS lines rather than to the electronic equipment. An analysis of the noise interference of the system indicated that normal line load was the cause.

From the beginning, it was felt that this telenetwork would have to be of the finest quality before it would gain high acceptance. Another type of transmission system, known as a dedicated telephone line, was investigated. A dedicated line incorporates amplification within a definite range, giving clearer voice transmission without annoying interference. It is similar to the class-A radio line used to broadcast athletic events from one city to another city. Dedicated telephone lines are now used exclusively, employing origination equipment no larger than a portable typewriter and weighing on 13 pounds (6kg).

The novelty of this telenetwork lies in the variety of programs that can be developed and offered. Both undergraduate and graduate credit courses are taught. Noncredit programs are presented as a community service across the state. Special programs also are directed to specific clientele, such as doctors, business

persons, and insurance trainees.

One of the most appealing aspects of the program is that the instruction may originate wherever there is a telephone. Usually, the lecturer simply dials directly into a telenetwork terminal. The conversation is then relayed to the portable amplifier. At a designated time, both the receiving and sending stations activate their units—very much like plugging a cord into an electrical outlet. When this connection is made, the instruction begins.

The Telenetwork presently has 27 major location terminals, each of which has several branch stations. These may be divided into subloops for individualizing course materials. The system has additional capability and could be expanded. An additional 20 subloops could easily be incorporated.

While instruction may originate at any of the locations, the instructor usually operates from one of the six state-sponsored universities now cooperating in the program. Some instructors prefer to travel among the various sites where students assemble in small groups. This enables some direct contact with students, and also provides opportunities for students to see and experience origination of at least one session of the course.

Telenetwork is not without problems. It is a demanding medium in terms of instructional planning. Supportive materials, such as transparencies, handouts, graphs, slides, and so on, are used extensively in most courses and seem to be almost essential. These must be prepared and distributed well before the actual class period in which they will be used. Each location has an individual who serves as monitor. The monitor is responsible for equipment operation and local coordination of scheduling and correspondence. The monitors are local residents who are selected, paid, and trained by the Regents Network.

The universities of Kansas have extended themselves into every part of the state through the Regents Network. Students take both graduate and undergraduate courses, and professionals keep up to date through educational experiences carried to them on the network. Research is being conducted to determine the most appropriate uses of the network. Redevelopment of courses that will match learning experiences to the unique advantages and limitations of this medium continues. The Regents Network has proved to be a tremendously valuable system for educational outreach to the extensive rural areas of Kansas.

The Regents Network is apt to become an increasingly valuable teaching medium as research and experience enable instructors and students to achieve maximum learning results by use of the system. It will likely become even more valuable to the people of Kansas as the need to conserve time and energy increases.

# THE CABLE CAMPUS—OREGON STATE

IRV LETOFSKY

Oregon State University sits in a delicious green setting in Corvallis, Benton County, south of Portland. The Willamette Valley is so much rich farm and lumberland, with plenty of deer hunting for diversion and some of the fastest salmon streams in the state (or so boasts the Chamber of Commerce). As small universities go, it is not uncommon, with one exception. While institutional education is struggling to harness television, particularly the potential of abundance on coaxial cable, Oregon State may be today's best living example of tomorrow.

The school began dabbling in television 20 years ago. But in 1966, Liberty Communications, Inc., owner of the Corvallis Television Cable Co., gave Oregon State its Channel 5 in perpetuity. In the ensuing years of trials and errors, the school evolved into what is virtually the first "cable campus" in the nation.

The hub of the system is the Kidder Hall Classroom Television Center, which is directed by Dr. Harold Livingston. His commitment is to instructional television, which, after all these years of the technology, still remains an abstraction to much of academia.

Although a man of most unusual calm, Dr. Livingston carries with him a well-developed hostility for enrichment television: "It makes my hackles rise," he says. "You don't solve problems with enrichment. We need to meet educational problems head on."

Oregon State has made great forward strides. It is not so much a matter of Dr. Livingston's skill in science as it is clever execution of the fundamentals of applied psychology. He took on the familiar old forces of educational reaction and scored impressive victories.

Administrators feared damage to their budgets. In fact, Leland L. Johnson, in a special Rand Corp. study of Oregon State, acknowledged that instructional TV is "still widely regarded as a frill."

Professors fretted over their comfortable old habits. Some didn't want their classroom performances available to any old Corvallis cable subscriber who happened across them on the dial. Such reluctance is common. A report by the Aspen Institute for Humanistic Studies asserts that one of the difficult obstacles of campus cable is faculty "ignorance or inflexibility" and the traditional anxiety over "technological displacement."

After the first fits and starts, Kidder Hall now disseminates 40 to 45 hours a week of instruction over Channel 5, from Psy 200 at 7:30 a.m. to Math 50 at 9 p.m. Most are high-enrollment courses, plus some computer-introduction lessons to FORTRAN and OS-3. Students can watch them in their homes and apartments, residence halls, or sit in five viewing rooms in Kidder Hall.

By Dr. Livingston's tabulation, more than 70 percent of the enrollees watch the lessons off the campus. The Corvallis system has about 9,300 houses hooked up to cable but now, through a new microwave connection, students who happen to live in nearby Albany and Lebanon can see Channel 5.

Over the school term, the cable courses have more than 8,600 enrollments (the campus population is about 15,500), which helps alleviate the parking problem that everybody has and (if you want to delve more deeply into cost efficiencies), saves Oregon State $40,000 a year in classroom costs by Rand formulas.

In addition to the in-home viewing by cable, Kidder Hall also operates a five-channel closed-circuit network that reaches into classrooms in 18 other buildings on campus. It distributes 80 to 100 hours a week of video instruction.

Teachers have been given time for team-teaching projects, for smaller, more comfortable groups of students, and one-on-one assistance. For more cost considerations, departments have more free time to pursue applications for special funding grants. (The Psychology Department, able by cable to cut its teaching load by three hours, used the additional time to develop research grants that resulted in establishing some advanced study.) Again, with Rand-type computations, the instructional savings amounts to $55,000 a year. That is, if TV teaching were dropped and the faculty returned to conventional methods, it would cost Oregon State $55,000 to maintain the present level of instruction.

Kidder Hall also programs modern language audiotapes on afternoons and evenings on three of 15 available FM channels on the cable system. These involve noncredit Spanish, French, German, Italian, and Russian. The staff also is trying to develop some tapes on study methods.

And there is more: Kidder Hall has started to fill in the 15-minute breaks between classes on the closed-circuit system by running promotions for the United Good Neighbor drive, and publicity for school plays and other campus events. All these are completed "productions" with the help of slides or film clips.

The cost of all this is ridiculously low by routine television standards. The Kidder Hall budget ran about $69,000 in the beginning years and has grown only $20,000. With some income from small research grants, used equipment from commercial TV stations, and the ingenuity of the center's engineers, the TV center now has a professional monochrome facility with the capability of transmitting monochrome or color TV lessons over Channel 5. The budget also covers maintenance and salaries for producer-director John Root, three engineers, a secretary, and three-fourths of Dr. Livingston, who, as professor of speech, also has classroom duties. On occasion, qualified students are brought in.

In addition to the usual student FM radio operation the campus has another project that serves to enhance its promises of cable.

On the second floor of Shepard Hall, across Campus Way from Kidder Hall, about 134 mostly upperclass students produce a schedule of more conventional television for Channel 11, the community channel on the cable system. The "courses" are run by Dr. Richard J. Weinman, head of the Broadcast Media Communication unit in the Department of Speech Communications. He is dedicated to the concept of "hands-on" experience.

It is, in effect, a graded, fulltime, student-run television station. It presents 15 to 20 hours a week of regular programs, and frequent "specials", for subscribers on the Corvallis cable lines. It amounts to three hours a night Monday through Thursday, and Oregon State and Corvallis High School basketball, football, and wrestling matches on weekends. For a time the students were running old films, like "Flicks of the '40's," featuring "Nabonga", with Buster Crabbe and Barton MacLane.

Students carry out the whole assortment of assignments. One student might do play-by-play announcing one term, then serve as producer of a public affairs program the next term. There are interview programs, musical variety shows, election night coverage.

On the half-hour nightly news, the resources include the United Press International wire service, audio reports from student newspeople on the FM radio staff, a developing "morgue" library of 35mm slides, Super 8 film clips of local events, etc. The emphasis is local news, with state news a second priority, and national and world news down the line.

Weinman has set up procedures for grading performance, "with some difficulty." But what is more vital to the true learning experience is the weight of deadline pressure. He notes that the students have developed the natural antagonisms of television production. The producer will grumble about the engineers, the directors fume over the "talent."

The Shepard Hall operation runs on a fraction of the Kidder Hall budget. They usually grub for money and equipment. To get some additional funds, Weinman set up a student sales department (no commissions) to recruit sponsorships from Corvallis merchants, mostly on sporting events. Spots cost $15 to $25. It has not been a bonanza but, Weinman will rationalize, at least the preparation of commercials is yet more "good experience" for the students. Good future news is a new studio facility for student communications and training to be built next year.

Corvallis, with a population of about 37,000, doesn't have a commercial TV station, so Shepard Hall is the community's only access to television information about itself. That function in and of itself produces excellent public relations for the campus.

Kidder Hall has about 500 hours of taped video lessons worth perhaps $200,000 in replacement value. They don't sit on the shelf very long, since they are erased and reused after two years, sometimes sooner.

Kidder Hall likes to work a year ahead, although the lead time usually is a term or more. Here's how a course might be organized: General Science 101, 102 and 103 might expect 700 or 800 students. Dr. David Willis assembles his staff, perhaps in a retreat, to plot out the curriculum. Later, a producer-director from Kidder Hall (sometimes a qualified advanced student) sits in for detailed planning. Members of the faculty with special expertise are called on to tape the appropriate course unit.

As a general philosophy against the television "talking head," Kidder Hall prefers that no more than 15 minutes of any 45-minute instruction be taken up by the lecturing professor. For a biology lesson, for example, the taping crew might drive out to the Pacific Coast for some ocean phenomena. In an economics unit on garbage disposal, city dumps are displayed. For one discussion of the cost of living, the staff collected still photographs from the Depression era and presented them along with an audiotape of FDR.

The minimum enrollment for a cable course is 250 students. Any fewer would not be considered economic use of the cable. The faculty also has established a rule against complete coursework on television, since direct contact with instructors has proven to be necessary for effective teaching. General Science will run two segments a week on Channel 5, and then the students come to classrooms on campus for recitations and labs.

Here is another approach to educational efficiency: Dr. Livingston, with the help of an $11,000 experimental state grant, has put together a multimedia program for the basic Speech 111 course and he is able to teach 42 students better and more effectively than the former classes of 21 students.

"They meet with me in the classroom seven times during the term," he said. "Then they are on their own. I assign them five audiotape projects off campus and two videotaped talks. Each student has a peer-partner of the opposite sex—a popular part of the course. They take quizzes over the reading materials at their convenience. In a controlled study we discovered that they make better scores using this method than when the teacher wants to give them the exams. That is, when they're ready, not the teacher. I'm also using four videotapes on communication theory for the course, with pauses in the tapes so that the students can write out their reactions.

"Remember, I'm teaching this class at 7:30 in the morning, and I had 11 people ask me specifically to get in this term."

The project began last winter and three other instructors subsequently used the system "with good success." They had 35 in each of their classes, compared with the normal 18 to 21 students.

To deal with the tender sensibilities of student and staff "performers", Dr. Livingston has set aside Kidder Room 108E as a classroom studio in which the video cameras can be remotely controlled by the user. He or she then can practice classroom oratory, study it on playback and then erase the tapes without anybody else being permitted to view them. It is in constant use, maybe nine hours a day. (A second such studio lab is now in operation.) For example, all graduate assistants in chemistry who teach recitation classes must present the faculty with two formal videotapes a year. Dr. Darwin Reese, considered a master teacher, works with the students three nights a week to help them with their presentational techniques.

There are indications, if not empirical studies, that the heavy use of video at Oregon State is producing a better student on the other side of the tube. At least one department has been conducting exhaustive research on an ongoing basis that shows student attitudes are better now on the campus than at any time in the recent past.

# AN INEXPENSIVE, INDIVIDUALIZED, QUICK DELIVERY SYSTEM

FRANKLIN J. KING
F. MILTON MILLER
DANIEL R. BRENDEN

A professional challenge was presented to the Industrial Education staff at the University of Missouri-Columbia to maintain the professional educational offerings (on- and offcampus) under some rather difficult circumstances. The search for a different type of instructional delivery system was brought about by a staff resignation, a hiring freeze, and a cut in extension travel funds.

The challenges that this new delivery system presented were many. A system was sought that would bring about an optimum utilization of the instructor's time—with a minimum amount of time spent behind the wheel of a car and a maximum amount of time spent for instruction. A system was needed that had the capability of instructing students with diverse educational backgrounds. Another capability required of the system was that of handling students located hundreds of miles apart and at the same time offering a personalized approach. The system also needed to be implemented and operated at a minimal cost to the department, using existing facilities and budgeted monies wherever possible. Materials had to be designed to facilitate their use oncampus and on an extension basis offcampus.

## Alternative Systems

Instructional television was one of the systems examined. In many locations, Missouri does not have a state educational television network; therefore, this system could not be implemented without incurring large equipment costs.

The use of radio was another alternative. This system was available but did not provide the students with an immediate means for interacting with the instruction. The lack of student interaction capabilities was a major drawback of this system.

The telelecture system was another method considered as a means of instructing students. The advantages and disadvantages of the telewriter were taken into consideration, but it was felt that the telewriter was not versatile enough for use in the delivery system. The telelecture system without the telewriter was found to be dependable and enabled existing facilities to be used. Verbal interaction with students could be held, and only a small investment in equipment was needed at a site in order for the system to be operational. The use of WATTS lines provided an economical and existing means of relaying information to classes at locations that were miles apart. This was the delivery system the staff selected.

## Design of Initial System

To complement the telelecture system, a classroom monitor was appointed at each location. This selection usually took place several weeks in advance of the first class session. The classroom monitor was vested with the responsibility of setting up the equipment, beginning and ending the class period, and ensuring that the students received the required supplementary teaching/learning items.

To aid the student's learning, slides were presented in conjunction with the presentation. The slides were based on a lesson plan format that Missouri has adopted for curriculum materials in vocational/technical education. This format logically presented the material and was already familiar to many teachers. Slides were taken of key points of the lesson using a step-by-step progression through the lesson plan. The slides provided the students with a "bird's eye" view of the instructor's lesson plan, enabled them to follow the lesson presentation more easily, and facilitated their note-taking.

Sets of slides covering each lesson presentation were made for the instructor and for each location. At the time of the lesson presentation, the instructor and each location proceded through the slide series simultaneously with an audible tone used to signal the changing of a slide. This method synchronized the slides at each location with those of the instructor.

A significant development for use with the telelecture system was the implementation of a Classroom Copy Sheet (see Figure 1). At the beginning of a lesson, each student was given a Sheet to guide the learning experiences. This sheet contained the lesson title; lesson objectives; informational assignment; supplementary teaching/learning items; classroom, laboratory, shop, or other activities; and the interaction items. This placed key information in the hands of the students and reduced the amount of notetaking required.

Live interaction also played a role in the telelecture system. If a student had a question, it was easy to ask it of the instructor. This enabled the student to receive a response before proceeding any further in the lesson. Time was also allotted at the end of the lesson to enable the students to ask further questions about the lesson information or their assignment.

The classes were scheduled to meet once a week. Utilizing the telelecture system made it possible for a single instructor to teach more than one course to any given number of sites in an evening by adjusting starting times.

Due to adult teaching responsibilities, a few students could not attend the regular telelecture class. These students' needs were met by taping the telelecture series and rebroadcasting it by shortwave radio at a more convenient time. Through-

out the year the suggestions of students and classroom monitors concerning the use of the telelecture system were sought. As a result of these suggestions, some modifications were made on the delivery system for subsequent classes.

**Revised System Design**

The role of the classroom monitor was expanded from that of a technical materials provider to one of a classroom director. The classroom director is now responsible for beginning the slide/tape presentation, establishing student break times, and ending the period. The classroom director also performs such activities as keeping attendance records, collecting and returning homework assignments, and distributing supplementary teaching/learning materials. Another important facet of the classroom director's role [illegible] of pre- and post-class activities. These activities consist of discussions and reports on both an individual and group basis, as well as the interaction sessions with the instructor.

An orientation session is held during the first class meeting. This session is designed to foster a positive attitude toward the course and the delivery system used. The session begins with an overview of the course and student responsibilities and requirements. This is followed by a brief history of the telelecture system. The operational characteristics of the system are then explained to the students. After a short break, when the students are once again in the classroom, one of the instructors contacts the class via the telelecture system. The instructor talks to the students for a brief period, and then each student is invited to the microphone for introductions and background information. This approach helps eliminate student anxiety and gives each student practice in speaking with the instructor. This interaction also provides the instructor with valuable information about the students.

To further assist the instructor with the identification of students and their present teaching responsibilities, Polaroid pictures are taken of each student and assembled into a picture file that includes information concerning what and where they teach. These pictures are referred to by the instructor during the interaction time to help link names and faces.

Another modification of the delivery system deals with onsite visitations by the visiting instructors. These visitations are made approximately once every three weeks. During the onsite visitation, face-to-face interaction sessions are conducted by the visiting instructors. These visiting instructors are selected from graduate students who have had prior teaching experience and prior instruction in the competencies being taught in the telelecture course.

The use of slides depicting the mannerisms and facial expressions of the instructors is another addition to the system. These slides are taken in the audio studio and are placed in the slide series to emphasize key points and to act as an aid in personalizing the series.

The major change made from the initial series deals with tape recording the lectures in an audio studio in advance rather than broadcasting an entire lesson and then holding an interaction session via the WATTS line. The recording of the lecture, together with the slides, is sent to each location. This process holds several advantages over the initial telelecture series: (1) The voice quality of the recording is superior to a WATTS line broadcast. (2) When a student cannot attend a session, provisions can be made to replay the tape and slide series at a more convenient time. (3) Students may review the series a second or third time if desired. (4) The cost of long-distance telephone calls is reduced since the lines are in use only during the interaction session following the lesson presentation.

The revised delivery system has proved capable for use in instructing a large number of students at several locations. The revised system enables the instructor teaching offcampus classes to spend a minimum amount of travel time and provides more time with instructional activities.

The oncampus students also benefit from the revised telelecture delivery system. Since the telelecture system is highly organized, it is easily applied to the organization of classes taught oncampus. The slide/tape series developed for telelecture may also be used for oncampus classes. The slide/tape series also provides a means of individualized instruction for oncampus instruction. Since a high degree of success has been experienced with the revised telelecture system, plans are being made to expand the number of courses that can be presented by this system.

**Figure 1**

**Classroom Copy Sheet**
**Lesson I-1**

Course Title/No. F-365 Occupational Analysis
Unit #I Systems of Analysis and Classification
Scope of Unit: To identify and show relationships of systems, subsystems, component parts and analysis techniques for instructional purposes

**System Analysis**
Lesson Objective: The student should be able to:
1. Operationally define the terms: analysis, system, subsystem, component.
2. List and illustrate four key elements of a system or subsystem.
3. Analyze specified items into component parts.

Supplementary Teaching/Learning Items:
Slide Series of Lesson Plan and Illustration Items
Classroom Copy Sheet I-1

Classroom, Laboratory, Shop, or Other Activities:
1. Assign groups to answer the interaction items.
2. Individually select an item; break it down into component parts. (Note: Write this activity into a one-page report and submit it to your instructor.)

Interaction Items:
1. What is the operational definition of analysis? system? subsystem? component parts?
2. What commonalities are there between any system or subsystem?
3. How can you illustrate four key elements of a system or subsystem?
4. What is the process of analysis?
5. What are the limits of the analysis process?

# ASTROTEACHING: INTERACTION BY SATELLITE

ROBERT E. HOEHN
JOHN CIVENS

**WANTED:** Large Classroom. Instructor located in Seattle, WA, wants to teach nursing students in Denver, CO; Bozeman, MT; Lexington, KY; and Bethesda, MD. Instructor must be able to hear and see students as well as students being able to see and hear instructor.

An impossible advertisement? Not if you have a CTS (Communications Technology Satellite). CTS, developed jointly by the Canadian Department of Communications and the National Aeronautics and Space Administration, is the largest spacecraft to date for exploring new communications applications. Launched in January 1976, the CTS is in a synchronous orbit 22,235 miles (35,576 km) above the equator at 116° W. Longitude.

The onboard transmitters operate at a higher frequency and with more power than those of any previous communications satellite. A 200 watt traveling-wave tube transponder, 10 to 20 times higher in power than earlier communications satellites, makes relatively low-cost terminals and broad geographical coverage possible. Nearly two-thirds of the United States can be covered at a time, and current estimates for receive-only ground terminals are $12,000 to $14,000. Nontechnical users can operate receivers in support of their own experiments.

The satellite weighs nearly three-quarters of a ton and measures almost 53 feet (16 m) from tip to tip of the solar array panels. The solar panels are capable of an output of greater than 1 kilowatt. Hydrazine jets are used for a very accurate three-axis stabilization system.

Since CTS was developed jointly, Canada and the United States share equally in satellite time. Each year of the agreement is divided into four quarters. Canada has access to the satellite on Monday, Wednesday, and Friday during the first and third quarters; and the United States has access on Tuesday, Thursday, and Saturday during those quarters. The days of access for each country are reversed during the second and fourth quarters.

In the spring of 1976, the satellite encountered a power problem during a solar eclipse. The problem was severe enough that the back-up power system had to be activated. Since a second problem could cause a complete failure of the spacecraft, it was decided to completely shut down the satellite during the two solar eclipse seasons occurring each year. The solar eclipse periods in 1977 are from February 25 through April 13, and from August 31 through October 16. All activity to CTS will cease during these periods.

In the United States, CTS is being used by a wide range of groups that fall into four general areas: (1) technology extension, (2) community and special services, (3) education, and (4) health care. In addition to testing the use of superhigh frequencies (12-14 GHz) in the technology extension experiments, experimenters will investigate attenuation of satellite signals under various weather conditions and explore digital video compressing technology. Community and special services planned for CTS include business conferences, disaster warning, and distributing news and entertainment to remote areas. Educators will experiment with sharing curricula and facilities, improving teaching skills, and using computer aided instruction.

## Health Care Projects

The Lister Hill Center for Biomedical Communications at the National Institutes of Health is coordinating the facilities used to serve the various health care agencies. In addition to the nursing project, health care professionals can perform biomedical experiments, interchange curricula, and support emergency medical care and clinical treatment.

Project NCAST, Nursing Child Assessment Satellite Training, is one of several experiments in the health care field. NCAST will begin transmitting a course based upon new nursing research in child assessment via CTS in April 1977. The planning for the satellite program began in March 1976. Three major areas have been planned and developed simultaneously: curriculum content; the technical aspects of the satellite, programing, and ground stations; and an evaluation plan. This article deals primarily with the technical aspects of the satellite, programing, and ground stations.

Since the early planning phases of the project, modification of the original design has occurred as a result of input from various agencies. For example, representatives of the Lister Hill Biomedical Communications Center assisted in site selection and in providing networks information. The Division of Nursing and the Health Resources Administration assisted in identifying project objectives. A distinguished advisory board contributed to the design of and the methodology for carrying out the project.

The experiment has been designed so that in the first transmission set, the population will be made up of nurse educators from Honolulu, HI, to Bethesda, MD. The students will be registered for a regular course to span a 10-week period.

The course is broken down into an orientation session, eight content sessions, and a final exam. Each class session will consist of two dis-

This project is funded by Contract No. 213-76-0014, Division of Nursing, Health Resources Administration, Department of Health, Education and Welfare. Dr. Kathryn Barnard, Professor of Nursing, University of Washington School of Nursing, is the Principal Investigator.

tinct parts. The first will be a pre-satellite hour divided into a 40-minute class period and a 20-minute break and return time. The second hour will be devoted to time on the satellite. The NCAST philosophy, substantiated by previous satellite applications, points to the fact that a two-way communication system with a capacity for live interaction is a more effective use of a satellite than is a one-way delivery system. Therefore, pertinent prerecorded material will be distributed and viewed prior to the scheduled satellite transmission.

To further test this philosophy, an experiment has been arranged that not only will test interaction, but also will examine the type of interaction necessary for maximum learning. The experiment will use three types of sites: full duplex, simplex with a telephone return, and an interactive videotape. At the full duplex interactive sites, the students will be able to hear and see the instructors in color, while at the same time the instructors will be able to hear and see the students in color. At the simplex sites, the students will be able to see and hear the instructor via CTS, while voice interaction will occur via a telephone hook-up.

The third type of site is an interactive videotape. This tape will be a composite of the full duplex transmission made up of both information from the instructors, questions from the students, and the answers or discussion from the instructors.

The experiment will be conducted twice in the first transmission set, once to the Eastern footprint and then to the Western footprint. In each footprint, there will be two full duplex sites, two simplex-with-telephone-return sites, and two interactive videotape sites. In each footprint, transmission to a full duplex site will be followed by a half hour of down time as a buffer zone, and then the transmission to the simplex site.

Transmission will be on Wednesdays during the second and fourth quarters of the year. Transmission will begin with the Eastern footprint in April, May, and June 1977; and to the Western footprint in October, November, and December.

In January and February 1977, prior to the actual transmissions, the entire 10-week course was given via a full duplex simulation. This provided the project with a check on the effectiveness of the course design, instructional materials, and evaluation plan. It also provided the project staff and instructors an opportunity to work under actual satellite conditions.

To do the simulation, the actual color studio was used in the satellite transmission. The nursing studio acted as the full duplex site. A complete duplication of all aspects of a satellite transmission, class, composite videotaping, time delay, and so forth, were simulated.

In the design of the project, there are three hypotheses. For the purpose of this article, only the first is of prime importance: The use of satellite interactive communication technology is a more efficient means of distributing new nursing research information to practitioners than standard methods. By standard methods, we are referring to present methods for nurse educators and nurse practitioners to gain information about new nursing research by attending lectures, conferences, and reading professional publication.

The objectives under this hypothesis will measure the differences in knowledge, anxiety, and attitude that occur among the various audiences at sites used. For example, will the participants at a full duplex site acquire more knowledge of nursing-child assessment than those at a videotape site? These kinds of information will begin to provide a look at the relative importance of the various kinds of sites in the learning process.

With this kind of information, along with tentative plans regarding a second transmission set, final plans can be formulated for additional transmission. One plan now in the discussion stage is to extend satellite programs to child-bearing women as well as to nurses.

# HOW-TO-DO-IT TECHNIQUES AND DEVICES

# HOW TO WRITE SUCCESSFUL ITV SCRIPTS

ROBERT B. JONES

You have written, or are planning to write, a television script. Are you completely satisfied with what you have done, or with the outline of your proposed script? How can you prove to yourself or to others that your instructional program was successful?

Commercial and educational television stations receive Nielsen ratings, perhaps Emmy Awards, or have other reward and rating devices that provide feedback as to the success of their programs. Can you write an instructional television script and feel confident that your "rating" as well as student success will be good? Perhaps you could consider the "Nielsen rating" of the instructional television program to be the success of the students who participate. Would you accept the student's grades or scores as a measure of your success?

### Aims of the Educational Television Writer

Somewhat different from broadcast or educational television programs, the primary purpose of an instructional television program is to teach certain skills or behavior which have been identified in advance by subject experts in the academic discipline of the program being produced. The writer for instructional television has certain advantages over the broadcast writer, since the instructional TV writer should know the specifics of the target audience; i.e., their age, knowledge and experience level, general academic ability, as well as the specifics of the instructional topic.

The instructional program writer, however, also faces a considerable challenge, since "teaching" involves far more than simply showing or telling something to students. In fact, an exact, behaviorally stated, description of the student learning to be accomplished by the program should be furnished to the writer before the script is begun. The writer should then specify the tasks students will be able to perform following their viewing of the television program.

### No Hard and Fast Rules or Guidelines

There are no hard and fast rules that completely guarantee successful learning, and, therefore, successful instructional television programs. There are, however, certain guidelines that greatly increase the probability that a TV program will cause effective learning. You should keep these guidelines foremost in your thoughts throughout the development of the program.

## Fourteen Guidelines for Writing ITV Scripts

## 1

### Develop the Rationale of the Program

Why is it important that this particular learning skill be taught by television? What is your teaching strategy? What is the cost for TV instruction (time, equipment, production crew, and materials) compared to more conventional methods of instruction? Perhaps you could teach the subject under question more effectively by another method. You must be aware that Instructional Television (ITV) is not the panacea for solving all instructional problems and that there are many different successful techniques for presenting visual instructional materials to students. Television must contribute a visual message which could not be more economically or effectively presented by another media. You should attempt to identify subject areas for instructional television that give the greatest return in savings of instructional time by reducing instructor and equipment costs and contribute to more effective learning by the student.

## 2

### Analyze Subject Matter

Once you select ITV as the instructional medium, you should analyze the subject matter to determine specifically "what" you are going to teach or have the student accomplish. You should outline the exact skill or skills that you wish your students to be able to demonstrate upon completion of the program. Then write out the methods by which you will test your students to see if they, in fact, did learn. Development of the script can then follow the outline of the skills or performance that you have established.

## 3

### Assess Entry Behavior

Before you start writing your script, you will want to find out as much as possible about the entry level of the students. How familiar are they with the subject matter? If the program is for familiarization or orientation, entry behavior is not as critical as if the program is de-

signed for teaching specific skills—especially those having more exacting technical requirements and involving technical or professional terms. Because the ITV program is expected to teach the predetermined objectives in minimum time, the amount of knowledge on the subject previously acquired by the students becomes very important. You should not waste time reteaching subjects, yet you must remember that some settling-down time is essential. A brief overview or review of topics is a good device to gain attention and focus thinking upon a specific topic or subject. This review serves as a starting point for subsequent learning.

## 4
### Develop Strategy

All that remains is the writing and production of the program. Before you start writing, consider the design strategy. Are you going to write a factual, hardhitting script; or do you plan to include some humor? If you add humor, how much should you add before you entertain more but teach less? You should try to limit the program to specific learning points. Anything that interferes with learning should be avoided. Too much humor could interfere with learning; still, not enough humor might interfere with learning since students rarely learn while asleep.

Also consider whether or not attitude change is important to the learning objective. Are motor skills required to demonstrate program mastery? Is the program highly technical with "new" and "unfamiliar" terms? How fast should you pace the program? How much time do you provide for thinking? . . . for review? . . . for student response? . . . for students to write notes? . . . for redundancy to reinforce and enhance learning of new ideas or procedures?

## 5
### Audience Identification/ Participation

Generally, the younger, or less motivated a student audience, the more attention-attraction you should write into your script. One of the more acceptable means of providing interest and audience identification without detracting from key learning points, is to provide a believable, realistic situation that is appropriate to the target audience and to the learning environment. Involvement of student peers as role models in the program is sometimes very desirable. Direct involvement of the viewers with the program should be designed into the script where appropriate. The use of workbooks in conjunction with the viewing of the ITV program, as well as requiring written responses during the program, are examples of methods by which participation and interest can be maintained.

## 6
### Relevancy

Since the program may be expected to teach a considerable number of predetermined points in minimum time, the ITV script must deal with these points almost exclusively. If a drama plot is used for its attention-holding qualities (as is often the case), real care must be taken to prevent the story element from detracting from specific items to be learned. Techniques of the commercial sales pitch such as sex, acid rock music backgrounds, or conflict scenes should be used with considerable caution. Such items might be considered for attention steps, contrast, mood, attitude developer, or whatever.

These commercial techniques also could be sufficient distractors to the students to block the learning process. A technical program for young masculine audiences was scheduled to use a very shapely girl in a brief bikini to demonstrate a technical procedure. Considerable discussion on the topic was required before a more suitable narrator was agreed upon. You should consider the reaction of your audience. Are the men watching the procedure being taught? Or watching the girl? If you have female students, how do they react to the shapely female in the bikini as their television instructor? You should evaluate every scene, each phrase or word, background music and special sound effects to determine the appropriateness of the item to the learning objective. The request to use the shapely lady in a brief bikini to teach technical procedures was not considered appropriate to the learning objectives.

## 7
### Emphasis

The best teachers throughout the years have used emphasis to highlight important words, procedures, or topics. The ITV writer should use aural, visual, or combined stimuli to emphasize main instructional objectives. Using rising inflection, higher volume voice, longer pause, are some means of providing aural emphasis, as well as choice of words or phrases such as . . . . "This is important," etc. Visual emphasis can be provided by the expressions of the narrator or teacher as well as standard TV techniques.

## 8
### Pacing

Television programs tend to compress time. There is little room for reflective thinking, for absorbing new terms, concepts, or for writing notes. The writer must pace the program to permit students to think or write notes and must indicate on the script the desired time for such pacing. The minimum time to allow the student to respond to a visual or aural message and make notes should be at least 15 seconds. The time allowed depends upon the complexity and amount of material being presented. Reviews, questions followed by answers to questions, are devices which some script writers use to break the rapid flow of information. These devices, together with others, permit reflective thinking, catch-up time, and reinforce the learning task.

## 9
### Sequencing of Events

Certain learning objectives pro-

vide a base for subsequent learning. These learning objectives should be presented early in the program. While it is true that students somehow muddle through the most inefficient learning presentation and sometimes combine different facts into a logical whole, it is much better to consider the material and organize learning objectives into a logical sequence for more efficient learning.

## 10

### Size of Information Increments

You may show students the picture of an object, such as the tail of a horse. The student understands that the picture is of a tail of some animal such as a cow, horse, or donkey. You show other pictures and describe the physical characteristics of the animal such as hoof, foreleg, trunk, neck, etc., and then show the student the entire picture of a horse. Now the student sees and understands for the first time that the pictures and information he has been receiving relate to a horse. First, show the student the full picture of a horse with general descriptive terms to set the stage for better and more efficient learning to follow.

The general introduction would then be followed by detailed information presented in fairly small sections, frequently summarized and reviewed. The final review summarizes the key points of the entire program. Overdoing any general guideline can be as detrimental as not following the guide. Common sense should indicate how much review or summary is required.

## 11

### Repetition—Review

Showing or mentioning a procedure once on TV does not mean that the student has mastered the procedure. An important item is usually covered at least three times during the program—once or preferably twice in the course of the presentation; once in a sub-review; and again in the final review or summary. The relative importance of an item can be determined from the performance objectives and by the test questions for the program.

The review is a special form of repetition. These are inserted deliberately to break the rapid pace of instruction and to allow the student time to review and correct his mental concepts or notes. The review should not reteach the subject topic word for word, but should summarize main points. Generally a review would be inserted following three or four teaching points, or at least once at the halfway point in a short program, and again at the end as the summary review. Two sub-reviews and a final summary review could be considered as average for a 30-minute program. It is not necessary to have a sub-review of the last few points in a program. If desired, such points could be included in the summary review.

## 12

### Cause and Effect

A large number of TV programs involve lengthy procedures. These are generally impossible to master if memorization by rote is expected. Whenever possible, when one action or scene is shown, its effect on the next action or the preceding action or scene should be stated. Always try to explain why something is done as well as outlining the steps in a procedure. Research indicates that students can recall significantly more related steps than they can isolated, or unrelated, steps.

## 13

### Response and Reinforcement

Students must be actively involved in the learning process. One of the most traditional means of producing learning is to elicit a response from students (normally in the form of a question), have the student respond (answer), and then provide reinforcement in the form of a reward for the correct answer. Student response during the program is most desirable. To cause student response, state the question clearly, allow sufficient time for students to write or think out the answer, then provide a written or verbal correct answer to provide reinforcement.

## 14

### Evaluation of the Program

You have written the script and the program has been produced and viewed by students. What was your "Nielsen rating"? Your review of students' examination performance should be oriented to highlight any weaknesses or faults in the script or production. One of the best features of television is the ability to modify portions of the program with minimum effort, cost, or time. Do not fail to correct any portion of the program that did not meet the teaching objectives.

### Summary

To summarize briefly, every instructional television writer should seek answers to several questions before and during program development. Questions such as: 1) Why are you using television as your instructional medium over another medium? 2) Who are the learners in the target audience, what are their entry skills, and what subject matter will you present to them? 3) What is your teaching strategy? 4) How will you develop effective student participation, cause student response, and provide reinforcement of learning during the program? 5) Can you sequence learning events in small-sized information increments having relevancy to subsequent learning objectives? 6) Have you provided adequate repetition and review steps suitable to the complexity level of the program? 7) Did you show relationships or cause and effect? 8) How will you evaluate the program to determine teaching effectiveness?

Hard experience has demonstrated that efficient and effective learning from television productions does not happen by chance. The success of the instructional program relates directly to you. Good luck, and good writing.

# INTERACTIVE COMPUTER-CONTROLLED TV FOR THE DEAF

LEONARD M. GOLDBERG
FRANK S. RUBIN

A major purpose of the Model Secondary School for the Deaf (MSSD) in Washington, DC, is to serve as a laboratory for educational experimentation. In the area of computer-assisted and computer-managed instruction for secondary-level hearing-impaired students, the MSSD is initiating long-term research and experimentation with a unique and innovative computer delivery system, TICCIT+10.

## TICCIT+10

The MSSD required a system that would provide random access/retrieval for videotapes, interactive computer-assisted instruction, visual communications, a schoolwide closed-circuit television network, and a cumulative record of student progress in learning activities. Responding to this need, the Mitre Corporation, a nonprofit research and development agency, combined standard TICCIT (Time-shared, Interactive, Computer - Controlled, Information Television) features with specially designed components, linked the system to an available larger computer, the DEC-10, and created the TICCIT+10. The TICCIT+10 provides the MSSD with a sophisticated computer system capable of fulfilling educational, communications, and administrative needs (see Figure 1).

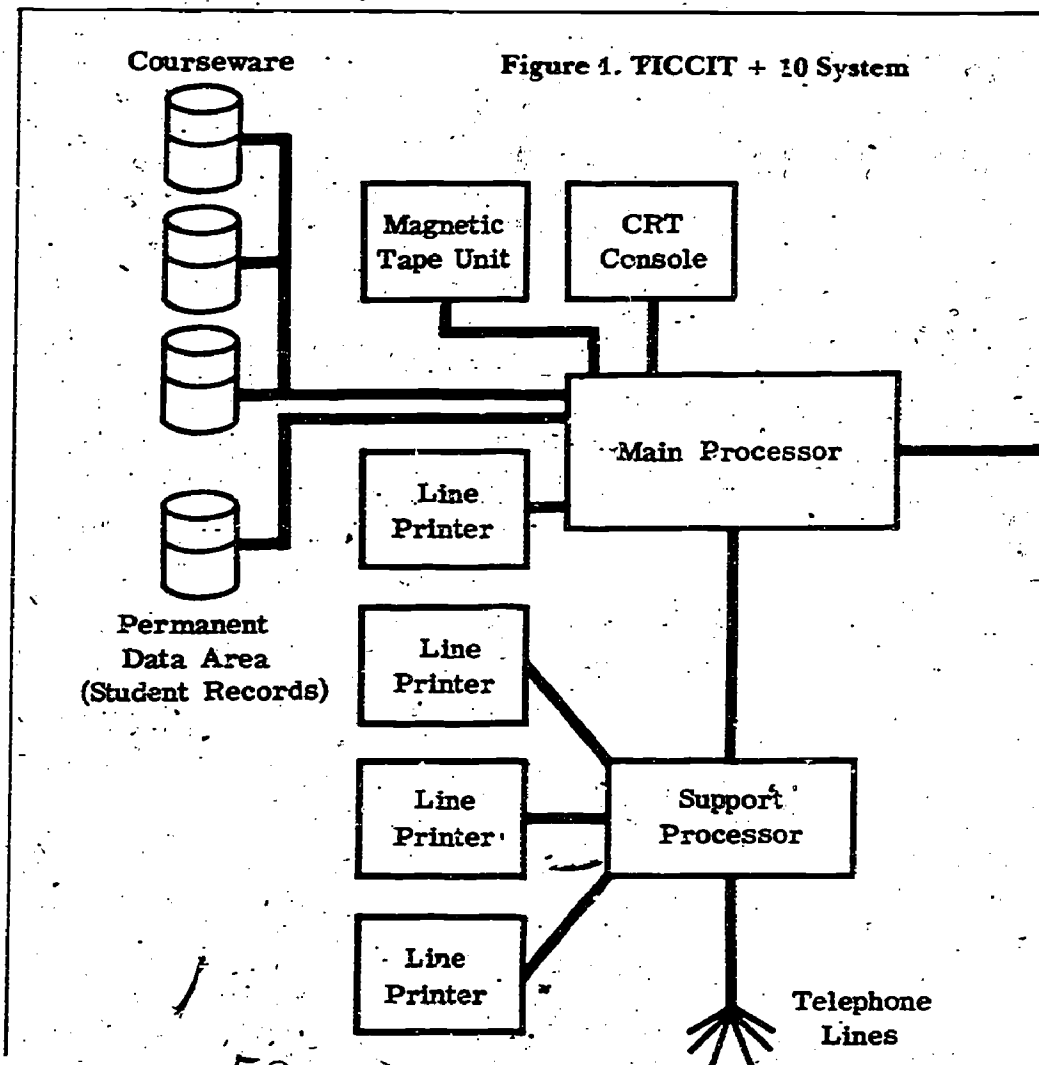
## The Educational Mode

Presently, instructional development teams at the MSSD are designing/adapting computer-assisted instructional programs that utilize the learner-control command language characteristic of TICCIT courseware. This method of computer programing allows students to move through the instruction at their own pace and will accommodate different learning styles. Computer-assisted instruction is designed on a three-level hierarchical structure: units, lessons, and segments.

There are two record-keeping features available through the computer that allow for monitoring student progress. The first system provides a continuous reporting of the student's progress, including an identification of which lessons have been completed, the number of trials required to attain successful post-test criteria, the last day a student interacted with the computer, and the duration the student has been working on a particular lesson. The second set of record-keeping information comes from a log tape. It provides a test-item analysis, and reports student interaction within a lesson's hierarchical structure.

Students have access to a videotape library, which allows them to select and view educational and entertainment videotapes. This system consists of several computer-controlled videocassette decks that serve as a random access/retrieval system. Students can control the motion and direction of the video

Figure 1. TICCIT + 10 System



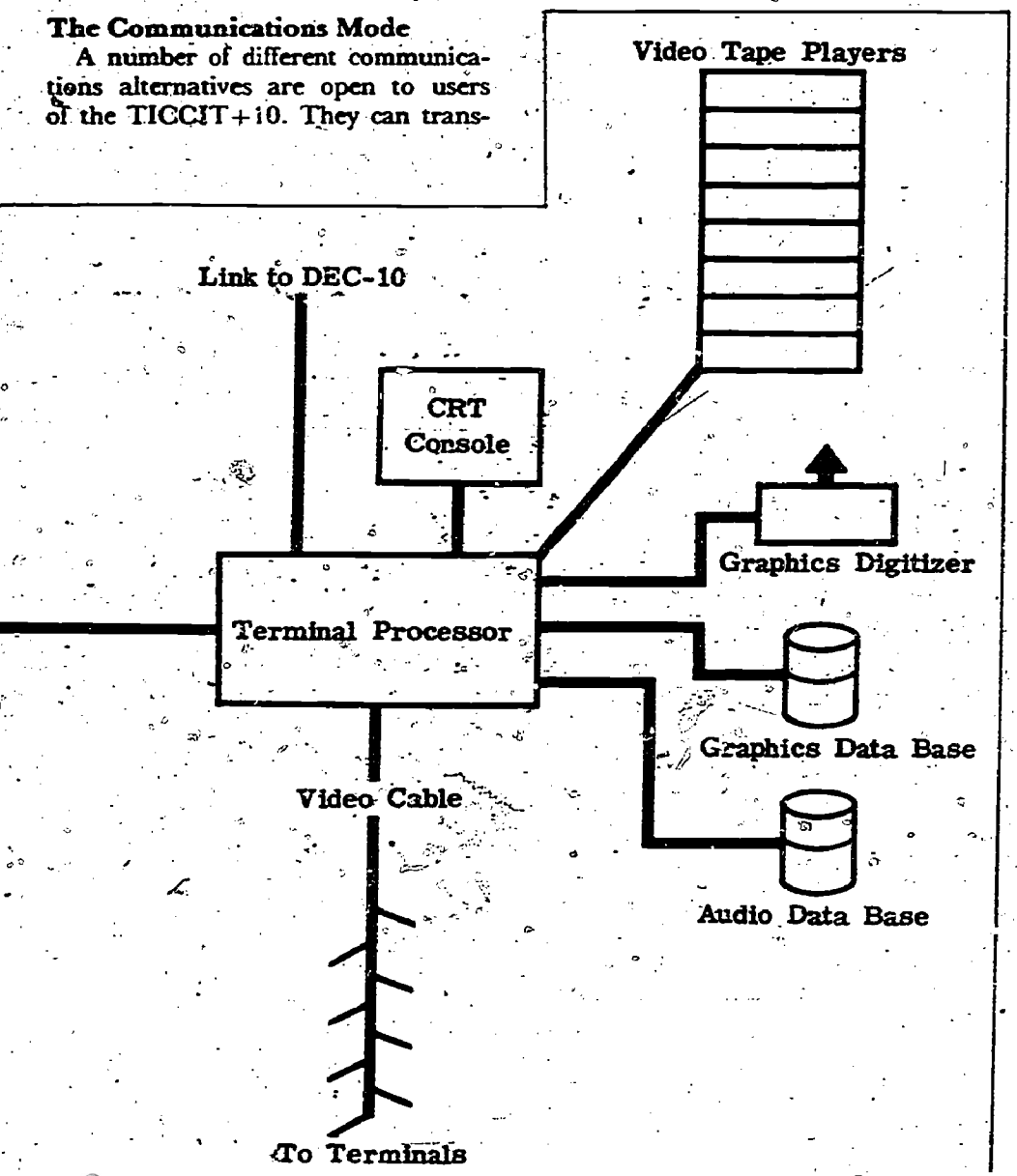
tapes in a number of ways: stop, rewind, fast forward, frame-by-frame, and pause.

Also within the system, the student can access a variety of instructional and entertainment computer games, as well as enter the school's cable television network. Available to students are off-air (UHF and VHF) channels and live and videotaped broadcasts.

### The Communications Mode

A number of different communications alternatives are open to users of the TICCIT+10. They can transmit and receive messages via the "mailbox" feature of the computer, have two-way interactive communication by utilizing the terminal-to-terminal capability, or connect to a remote terminal (TTY) anywhere in the country by using the TICCIT+10's eight-line telephone rotary capability. TTY communication is displayed over the terminal's television screen and papercopy can be generated through a remote line printer.

One of the more unusual features of the TICCIT+10 is the videophone. The videophone permits both aural (auditory) and sign language/lip reading (visual) communication between hearing-impaired users by the provision of both sound and sight transmission. Conference calls involving up to 25 individuals are possible over the TICCIT+10 videophone.




### The Administrative Mode

Since the TICCIT+10 is linked to the larger DEC-10, the MSSD personnel can use data programs concerned with personnel, student, budget, research, and operational information. The computer will also be used to plan programs, record academic information, and schedule classes.

MSSD personnel will also be able to create and write their own computer programs using the available computer languages within the DEC-10.

### Directionality

The MSSD hopes to gain a better understanding of the role that computers can play in the education of hearing-imparied students. Additionally, the cost effectiveness of using computer-assisted instruction, the effect of student-computer interaction, and the manner in which the communication features of TICCIT +10 affect the MSSD learning environment are areas of concern.

The MSSD plans to disseminate all research findings to professionals in the field of education of the deaf and other interested individuals. Also, modified versions of TICCIT+10 courseware and its related supplemental instructional materials will be distributed to other programs for the deaf.

# VIDEO TROUBLESHOOTING FOR THE TECHNICALLY BUTTERFINGERED

JOE WAGGENER
TIM KRAFT

It is easy for some people to get turned off by audiovisual hardware, especially by the seemingly unpredictable behavior of videotape equipment. The electronic world of videorecording and playback equipment is in the realm of magic for a great many people who could otherwise use it effectively—including people in charge of media operations.

Yet small media operations without technicians are becoming increasingly responsible for video playback and recording equipment distribution and services. The immediacy of video makes it a powerful instructional tool in schools, business, industry, and government. The public access features of cable television systems often call for video production skills by untrained people. The videotape users who are strangers to electronics need to know how to quickly identify, solve, and avoid the common problems that can spoil an otherwise carefully planned video project.

The two most common problems with videotape equipment are dirty video heads and broken cable connections. This is our finding, at least, after three years of keeping track of trouble with ½-inch reel-to-reel equipment in the student-operated video service unit in the School of Education and Allied Professions at Miami University.

## Identifying the Problem

The technically uninitiated can learn to identify these two problems quickly when learning to operate the equipment by checking for certain symptoms. The video heads are probably dirty when (1) the screen is partially or fully snowy while the videotape recorder is playing a tape; and (2) the screen is still snowy while the equipment is playing back a different "known to be good" videotape; and (3) the screen is snowy while the VTR is on Stop and the monitor/receiver is switched correctly to the VTR mode (this last criterion may vary from one brand to another).

The 8-pin cable connectors are likely to be the problem in the playbacks when (1) no picture or snow comes from the playing VTR while the monitor/receiver is properly switched to the VTR mode; and (2) no snowy screen appears while the VTR is switched to Stop and the monitor / receiver is properly switched to the VTR mode.

The camera cable connectors may be the problem if the monitor in the camera has a picture, but the properly switched monitor/receiver does not have the same picture while the VTR is in the Record mode and is properly switched to Camera.

Solving these two common video problems can usually be done quickly once they are identified. Or they can be avoided completely if certain practices are followed.

## Dirty Video Heads

To solve the immediate problem of dirty video heads, try the following: (1) Remove the tape and, using head cleaner and a chamois-tipped video headcleaning stick, gently wipe the two videorecording heads (they are 180 degrees apart). Use a horizontal motion only. Rethread the tape. The snow should disappear. (2) If this does not clean up the snow, apply *very light* index finger pressure to the moving tape at position 1 as shown in Figure 1. (3) If the snow still prevails, substitute another VTR unit and clean the heads later with a chamois-tipped headcleaning stick and denatured alcohol. A cotton swab can be used to clean audio heads and other areas of the tape path, but they should *not* be used on the videorecording heads.

To avoid being tripped or stopped by dirty video heads, practice the following: (1) Keep a can of spray head cleaner with each VTR at all times. (2) Keep the videotape clean, since it is the major carrier of dirt to the heads. Keep tape ends off dirty surfaces. Leave plenty of leader before starting to record so that the dirty end of the leader can be cut off. Keep tape stored in proper plastic envelopes and boxes when not on the VTR. Keep a dust cover on the VTR. Keep tape away from cigarette smoke. (3) Routinely clean video heads and all other heads, guides, and rollers in the tape path with a chamois-tipped headcleaning stick or cotton swab and denatured alcohol. This should be done before each recording and playback session. To avoid transfer of dirt, use the cleaning stick for one cleaning only. (4) Be extremely careful when cleaning video heads. They are easily damaged by hard objects, such as fingernails, and are costly to replace. Use horizontal strokes with the cleaning stick—never vertical strokes. (5) Some rolls of tape—possibly one in a hundred—have an oxide problem, and these will continually clog the videorecording heads. Before recording a program, it is desirable to record a 5-10 minute test and check the playback of the last minute or two. If there is an inordinate amount of clogging and dirt, do not use that tape. Please note that when recording, most VTRs display on the monitor the input to the recording heads rather than what has just been recorded on the tape. If the heads are clogged or get clogged during recording, you may not know about it until playback. (6) Whenever possible, have back-up equipment ready to substitute. This is a very important strategy in avoiding a complete breakdown of service in an operation that has no in-house electronics technicians. It is often less expensive to keep ample back-up equipment

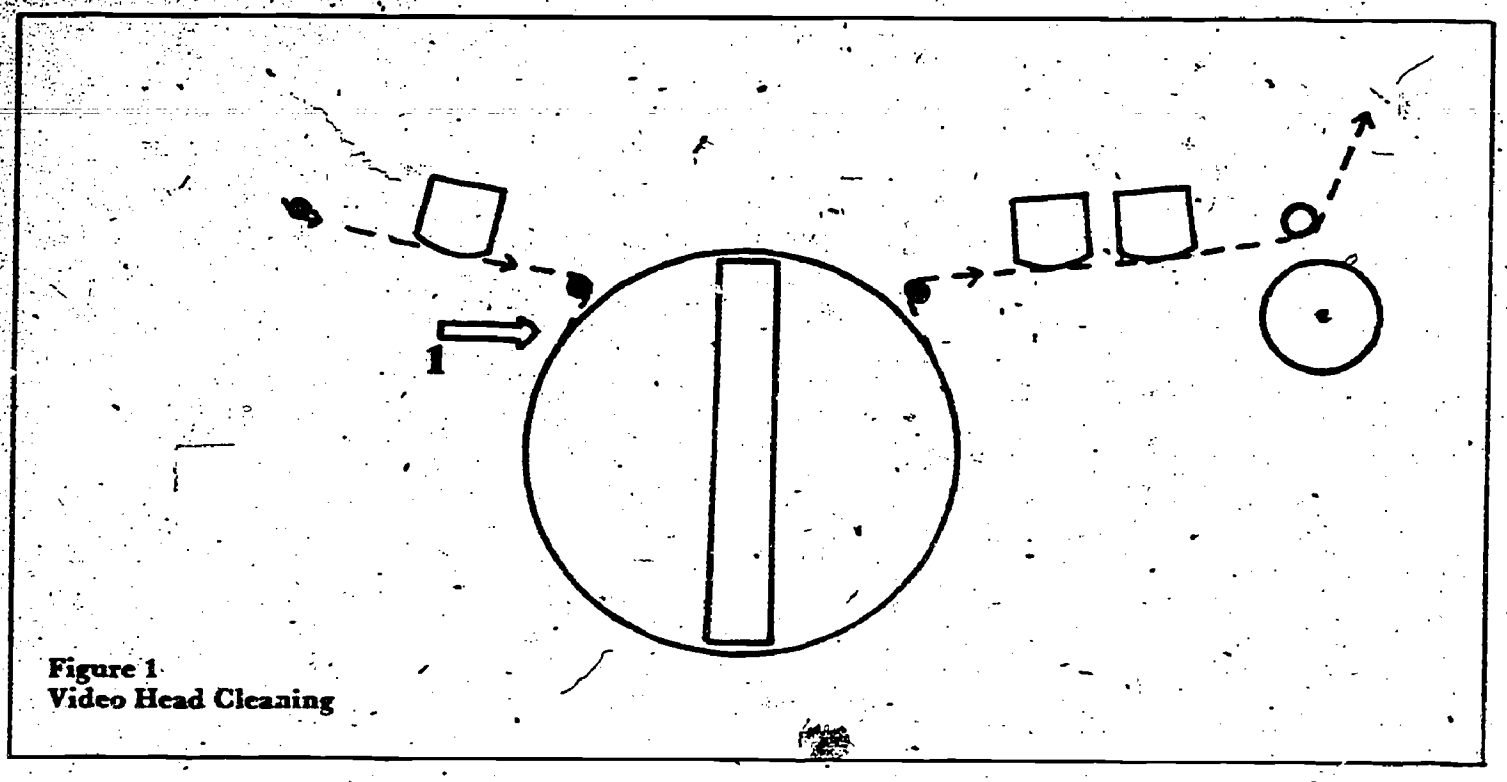



**Figure 1**
**Video Head Cleaning**

ready than to hire a technician.

**Broken Cable Connections**

To quickly solve the faulty cable problem, use the following techniques: (1) Use substitute cables. Have extra cables easily available. (2) Bring in completely different equipment and troubleshoot later.

To avoid the common problem of broken cable connections, practice the following: (1) Test equipment for proper functioning prior to each use. Start this procedure at least 30 minutes before it is to be used. Retest after equipment is delivered. (2) Be kind to the cables. Don't force connectors if they resist. Don't drop or excessively bend or pull cables. (3) Store cables in an orderly way, coiling and hanging them on a rack rather than jamming them into a drawer or cabinet where they will get tangled and possibly broken. (5) Teach yourself and your assistants to take connectors apart and repair them. This is a simple skill that will save time and money and will let you keep a good supply of functioning substitute cables.

# ADAPTERLESS AUDIO

MIKE LEWMAN

Anyone who is involved in providing various media services has at one time or another been faced with the task of dubbing from one tape recorder to another or transcribing from a record player to a tape recorder. Unless you were very fortunate you also were probably forced to cope with the "adapter hassle". It might seem that with no real standardization among manufacturers on the type of input and output connections on audio equipment that the use of adapters is about your only alternative. Take heart—there really is another way!

Professional broadcasting operations and recording studios have used audio patching systems of various types for many years, and have successfully beaten the problems of interconnection of multiple pieces of equipment. However, media personnel in schools, who are confronted daily with many kinds of audio demands, rarely capitalize on the convenience and efficiency of an audio patching system. In fact, quite understandably, many media personnel have no idea what is meant by "patching audio."

The idea behind all patching systems is really quite simple. It involves a centralization of all inputs and outputs from all the equipment you wish to interconnect. A wire is run from every input and output, connectors are attached and secured to some type of panel. With all of the inputs and outputs centralized and labeled, interconnection is made very easily by the use of a "patch cord" which is nothing more than a short length of cable with the appropriate connectors on each end.

The use of a patching system has many advantages. In addition to eliminating the hassle and expense of using various types of adapters, it also makes it unnecessary to turn machine upside down and sideways as you search frantically for an elusive connection point. A patching system also eliminates, or at least minimizes, the necessity of re-connecting various machines every time you need to transfer recordings.

By now, you may be in agreement that a patching system could be helpful. But you are probably concerned about how complicated and expensive it is to set up such a system. It is possible to invest in very elaborate and expensive patching arrangements such as those used in broadcasting and recording studios. However, at Columbus East High School in Columbus, Indiana, we have put together a system that is simple, cheap and very useful.

At Columbus East, in our media center, we have a small room with a built-in counter top which was ideal for adaption as an audio recording area with a working patching system. We elected to integrate into our patching system: one record player, two reel-to-reel tape recorders, two cassette recorders, and two small, wall-mounted speakers. We ran wires from all the inputs and outputs on the machines down through holes drilled in the counter top into a short length of electrical conduit which terminated in a small, wall-mounted chassis box. By mounting standard ¼-inch phono jacks in the chassis

box and connecting all of our wiring from the equipment, we had created a patch panel. Patch cords were made by mounting ¼-inch phono plugs on the ends of 15-inch lengths of cable. A diagram showing the position of all the inputs and outputs was drawn and placed near the panel for ready reference.

With our patching system complete, it now is very easy to go from one recording format to another; i.e., reel-to-reel to cassette, etc. On the patch panel we wired together two groups of four jack clusters to create "multi" units. The output of a machine can be patched into a "multi" unit, and three outputs can then be patched out to the inputs of various machines. This makes it possible to make multiple copies of tapes in various formats all at one time. With a little instruction, it was very easy to show students, teachers, and teacher aides how to use the patching system. Now everyone can do audio production with increased ease and efficiency!

We used several pieces of equipment in our patching situation. However, it should be emphasized that all the equipment can be easily disconnected and moved to a classroom or wherever else it might be needed. All the wiring is labeled so that reconnection back into the system can be easily accomplished. You can tailor your system to your needs, and use as much equipment as needed to meet your demands.

We estimate that we have approximately $40 to $50 invested in connectors, wiring, the chassis box, etc. The entire design and installation process was accomplished in a couple of days. If you are overwhelmed by the thought of stripping wires and putting on connectors, most likely a willing student could be enlisted to help out. Most Industrial Arts teachers can quickly recommend capable students for such a task. If you really want to make your audio service operation more efficient and more workable, you should give serious thought to working up your own patching system. Then you will be well on your way to "adapterless audio."

# HOW TO VIDEOTAPE THROUGH A MICROSCOPE

KENNETH DUBEY

Why be limited in just capturing conventional action with your videotape equipment? Now there is a way to videotape micro-organisms through any standard school microscope. The process is simple, but the results are outstanding. It is an especially good procedure for the science teacher who wants to show the entire class a certain micro-organism without the difficulties of having each student come up to the microscope. The microscopic world in action, captured on videotape, is a unique learning experience. It is also a way of letting students express their own creativity by doing the actual videotaping.

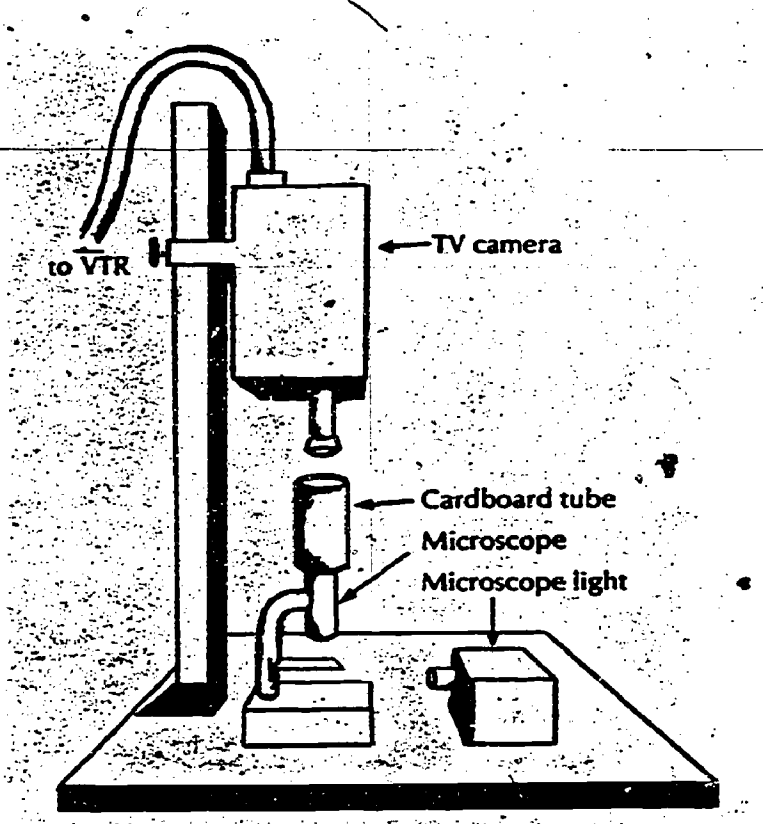
To videotape through a microscope you will need the following:

1. A videotape recorder (VTR) with a monitor and a television camera. (Do not use an extremely heavy camera, it will not have enough support.)
2. A photographic copystand. (You don't need the type with the lights on it.)
3. A cardboard tube, like the kind found in the center of a roll of paper towels.
4. A microscope and a microscope light.
5. About four 2" x 4" pieces of heavy cardboard.

Set up the VTR in the conventional manner. Connect a closed-circuit television camera and the TV monitor to the VTR. With the camera in the off or stand-by position, remove the camera's lens (most of them just screw off). Also, take any preview monitors off the camera. You want the camera as light as possible, otherwise it might be top-heavy. Connect the camera to the copystand by means of the mounting screw. This screw fits into the bottom of the camera where a tripod would normally fit. If you use heavy cardboard between the camera and the copystand, a tighter connection will be made. Next, place the microscope directly under the open lens of the camera. Place the cardboard tube between the camera and the microscope's eyepiece. The tube should be positioned so that the camera can look through the cardboard into the microscope.

Now you are all set to put your slide on the microscope. Turn on the microscope light and VTR system. In order to focus, first use the low magnification on the microscope. Then move the camera up or down on the copystand. You will find that the higher the camera is raised, the larger the picture will become on the monitor. Once you find the picture in focus, use the microscope's fine focus for a clearer picture.

After a little practice, you'll find it fun to videotape through a microscope. To make it more interesting, let students record their own sound track. They can use a combination of sound effects and music as they narrate what they see.



# CUTTING THE AV UMBILICAL CORDS

NEAL L. VINSON
WILLIAM R. ATKINS

The use of audiovisual equipment by a seasoned and knowledgeable instructor allows the communication of complicated ideas and techniques with great power and economy of classroom time. However, the use of several units of audiovisual equipment during a presentation often has the instructor fumbling with control cords. He appears to be "wired for sound" and is restricted to a small section of the podium by these electrical umbilicals.

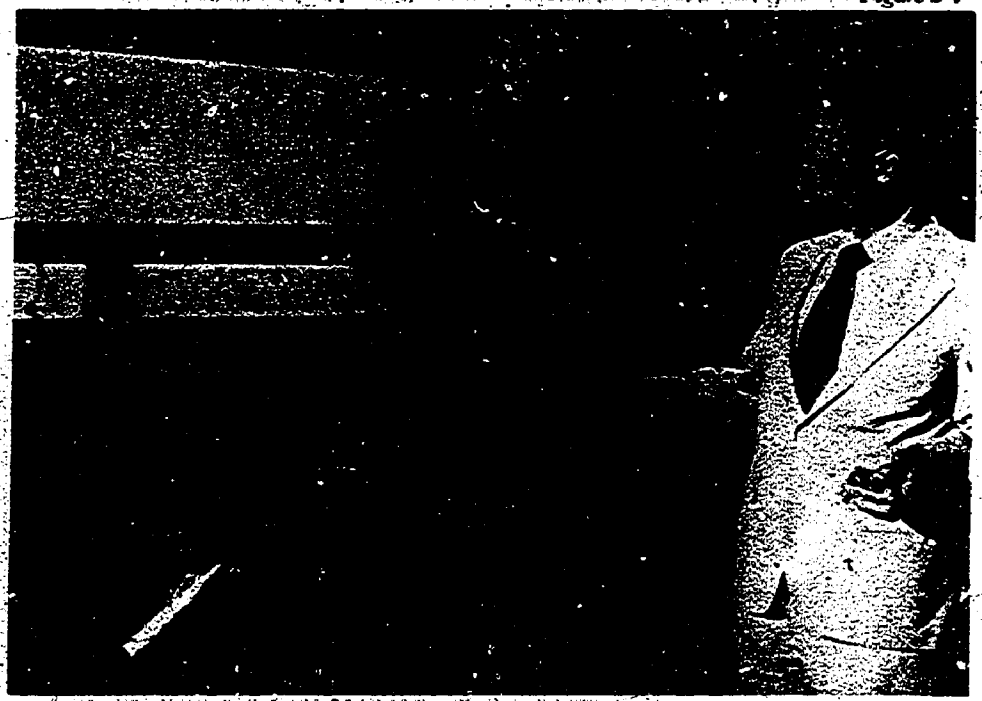
We have evolved an audiovisual system which is remotely controlled without wires and allows the instructor complete freedom of movement. The wireless audiovisual control system permits replacement of all of the power and control cords shown in Figure 1, with the small hand-held transmitter being used in Figure 2. The receiver of the system may be permanently installed or incorporated into a mobile audiovisual projection center.

*Figure 1*

The first wireless system we designed and built was incorporated into a mobile cart (Figure 3) intended to hold three Kodak carousels, one 16mm motion picture projector, and one Wollensak 2550 AV slide/sync tape recorder. In addition, a Kodak carousel dissolve control is located next to the tape recorder. Two small speakers provide external sound sources for the motion picture projector and the tape recorder. The receiver of the wireless system is located, along with a power and distribution chassis, behind the cabinet doors (Figure 4). Signals from the hand-held transmitter are captured by a small sensor (Figure 5) located between the projectors on this mobile cart.

A second mobile wireless, remote system was built utilizing a metal cabinet originally purchased with an overhead projector. The cabinet was modi-

*Figure 2*



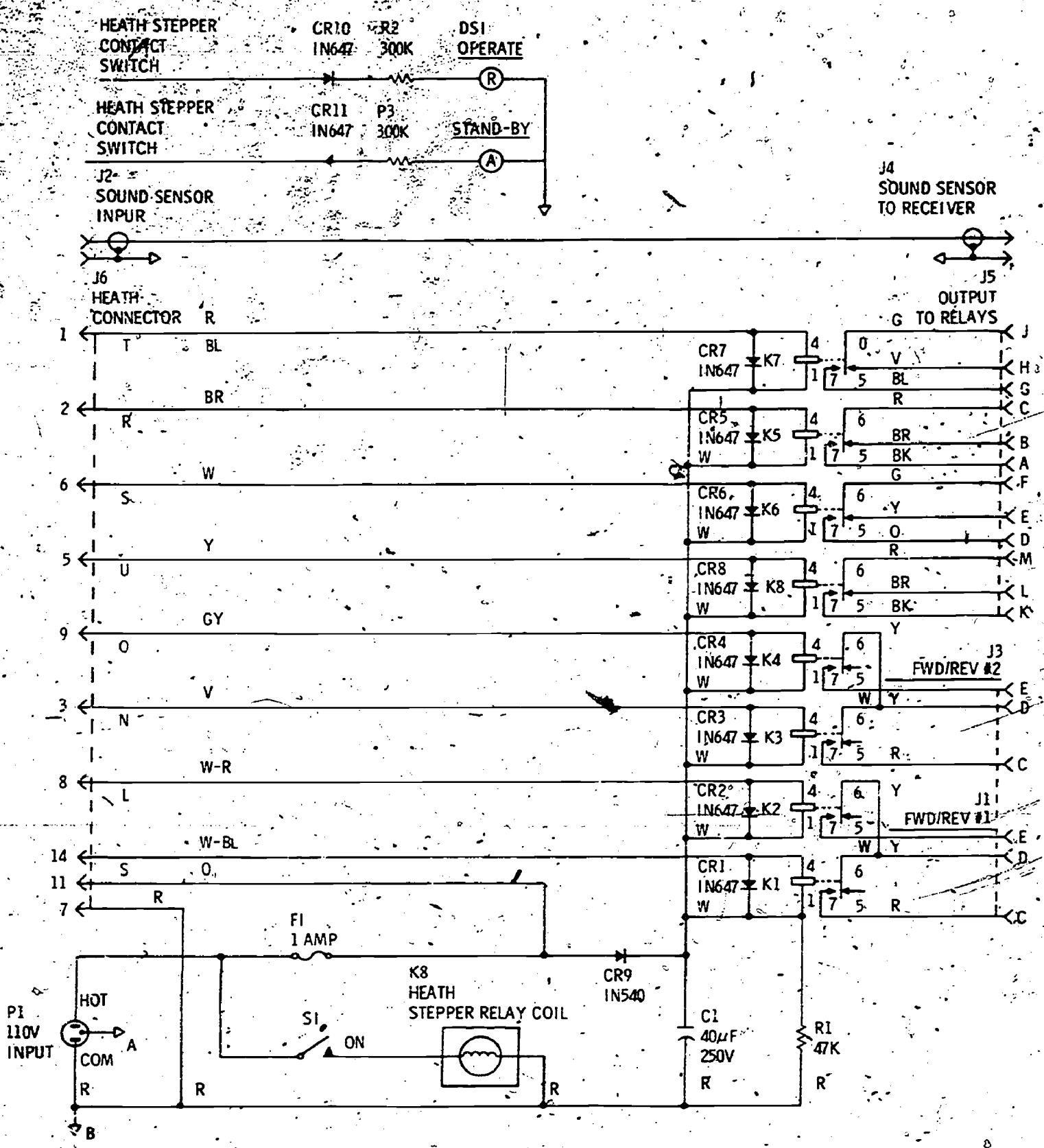



*Figure 10*

single projector may be used for a sound-slide/synchronous presentation. In either case, the sound-slide/synchronous presentation may be turned on or "off" with the hand-held transmitter. The tape recorder may be used to provide background music for waiting time prior to actual briefing or instruction.

The direction in which the development of the wireless audiovisual control system progressed was affected by cost and environmental considerations. In the beginning, we thought in terms of using RF signals generated by a hand-carried transmitter to direct traffic at the AV complex. The thought died in the conceptual stage because of

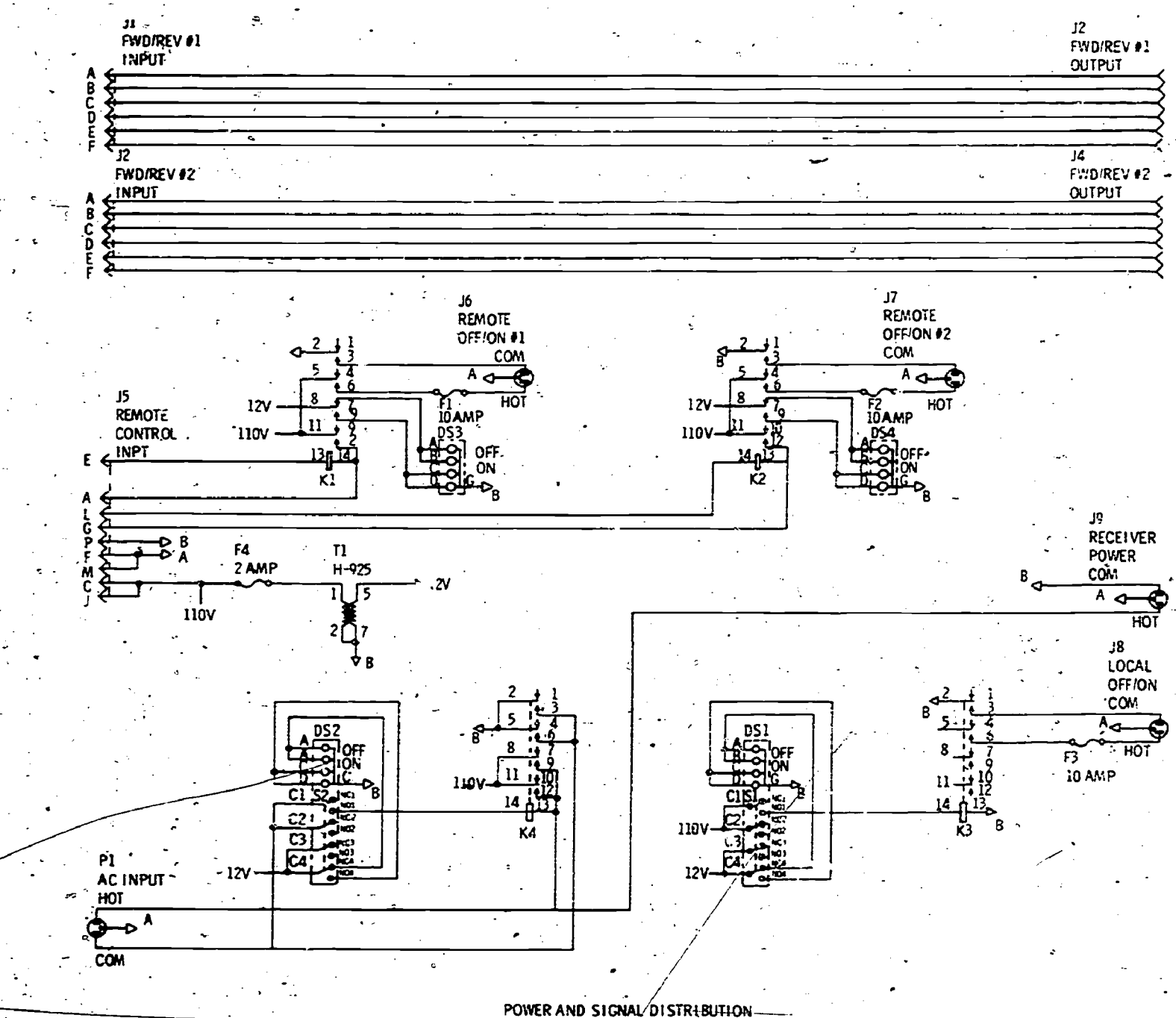



*Figure 11*

development costs and possible interference with laboratory RF equipment.

Our attention quickly focused on the sonic (35-45 kHz) transmitter and its receiver, as packaged for use in the control of the home television receiver. Some modifications of the kit and an extension of its power control capability easily adapts it for audiovisual control.

Heathkit's Model GRA-900-6 was purchased. Glen Corbett of our Facilities Engineering Division designed a power and signal distribution auxiliary and the small circuit modification of the Heath receiver circuit necessary for our application. Building of the receiver and signal distribution units (Figures 8 and 9) was done by apprentice electronic technicians. The circuitry (Figures 10 and 11) is simple enough to make an excellent vocational school project that would add new audiovisual capabilities within a school system.

These wireless systems are usable in relatively large briefing rooms. Experience shows that transmission distances up to about 30 feet are practical. In smaller classrooms the signal strength is high and the necessity for pointing the transmitter in the general direction of the receiver sensor becomes less important—often reflections of the signal from walls or ceilings are sufficient.

The use of the remotely controlled audiovisual equipment with small groups is especially effective. The instructor can sit with his class; and, with the aid of an illuminated arrow projector, conduct his class in a very informal way with greatly enhanced rapport with his students.

# MINI-VTR PRODUCTIONS: HOW TO MAKE A

SIGRID A. TROMBLEY

Though a course in instructional television is offered in our Library Science/Educational Technology Division, the need for at least an introductory experience with a videotape recorder (VTR) in one of the required basic media courses became apparent. Since the instructional television course is an elective for students in the LS/ET masters program, some students simply couldn't fit it in their programs but still had wanted to know "something about videotaping." Others who intended to take the course had a need early in their programs to be able to do some simple videotaping.

Many other students from various departments and schools on campus take one of the basic media courses as an elective. These people often take only one course in our division. If such students are to have any exposure at all to VTR, they must get this exposure in a basic media course.

It was necessary to give students an opportunity to handle videotape equipment, begin to overcome their fear of using it, and actually engage in small-scale production activity. Because of our need in the basic media course to cover so many topics, the videotape instruction could require no more than one 3-hour class period. In a mini-VTR production exercise, each member of the class participates as a member of a group of four or five people.

When I first asked students to engage in the mini-VTR production exercise, I found that the groups lost considerable time trying to choose a topic for their productions. What often resulted was a 5-minute videotape of purposeless conversation about some vague topic, interspersed with long pauses when those talking could think of nothing to say or do.

To save time and encourage better videotapes, production tasks were assigned the next time students did mini-VTR productions. Each of the groups in the class was assigned one of the following tasks:

1. Your production company is to show us what the symptoms of "befshober" are and demonstrate techniques for treating it.
2. The job of your production company is to demonstrate the skill of "kaschlockering." You may decide what kaschlockering is and how it is done, but this skill may not be the same as a skill we already know.
3. Your task as a production company is to demonstrate how "ziltsky" is made. You may decide what ziltsky is though it may not be something we already know by another name.
4. Your production company is to teach us what the concepts "zof" and "jadker" mean and to teach us how to differentiate between the two concepts. You may decide what "zof" and "jadker" mean, but they may not be [illegible] for concepts we already know.
5. Your production company is to demonstrate possible uses for a "pod-kalffir." You may decide what a pod-kalffir is, but it may not be another name for something we already know.

By providing a production task, the initial time loss in choosing a topic was eliminated. The nonsensical nature of the task forced the students to think creatively and produce videotapes that often reflected atypical and unique ways to visualize ideas.

Each group was given instructions for operating the videotape recorder, monitor, and camera. In addition, the following set of procedures and information was to be kept in mind

# SUPPORT FOR PLATO: A DYNAMIC TELECOMMUNICATIONS NETWORK

ERROL M. MAGIDSON

Many educators are already familiar with the instructional uses of the PLATO[1] computer-based education (CBE) system of the University of Illinois, Urbana, which is one of several PLATO systems.[2] However, they may not know that the still-growing PLATO IV system has led to the development of, and has itself been supported by, a sophisticated telecommunications network.

The central computer of the University of Illinois PLATO system is now being used by about 120 colleges and universities, medical facilities, medical schools, public schools, government agencies, and businesses across the United States and Canada. Content and CBE specialists from these institutions have prepared and shared more than 6,000 hours of student-tested instruction in more than 100 subject areas.[3] Hundreds of thousands of students at all educational levels and hundreds of instructors and CBE professionals have used PLATO.

The communications components being used on the PLATO IV system by its clients—CBE specialists, lesson authors, instructors, and students—include CBE notes, special interest notes, personal notes, "talk" features, and journal articles (see Figure 1).

The PLATO-system staff solicits ideas from clients for developing and revising both computer hardware (equipment) and software—the programs and instructions directing the computer's operation.

A "Bulletin Board" on the computer announces major PLATO developments and gives notice of equipment testing. Announcements provide details on new or revised computer language commands and supportive software services, data-keeping packages, communication developments, local site management packages, and class and curriculum management packages.

A "Public Notes" section serves as a forum for client input on software development and problems; notices of CBE articles, presentations, and job opportunities; information concerning CBE matters; and information concerning newly developed CBE lessons or packages that other clients may be interested in using.

An easily understood example of how users' ideas may be put into use is the change in wording permitting a person to join the system. At one time the entry was, "Type your name; then press NEXT." Often,

**Figure 1.**

—PLATO NOTES—
06/27 14:54

CHOOSE AN OPTION>

a. SYSTEM ANNOUNCEMENTS
b. PUBLIC notes
c. Other GROUP & STUDENT notes
d. PERSONAL notes

>So how do you like PLATO?
>I think it's great! ("talk" feature)

*System Announcements, Public Notes, Special Interest Notes (Group and Student Notes), and Personal Notes are available to the PLATO user. Notice at the bottom of the simulated screen that the "talk" feature is being used.*

**Figure 2.**

Public Notes
Response 6 of 15 to #10

8/12/76 3:38 pm barr economic

More than once I have told a student that his PLATO, User or sign-on name is "smith j" (i.e., last name space first initial). And what does PLATO say: "Type your name" and he types "john smith."

"Type your PLATO name" would not only be less confusing to students, it would force us to use the same terminology instead of PLATO, User, sign-on, names. Which should reduce confusion for new students,

mike barr

*Here is a Public Note response to a suggestion that the wording of how a person signs onto PLATO be changed.*

[1] PLATO is an acronym for Programmed Logic for Automatic Teaching Operations.

[2] Other PLATO systems include those operated by Control Data Education Company, the University of Delaware, Florida State University, and the University of Quebec.

[3] Elizabeth R. Lyman, *PLATO Curricular M... No. 6*, CERL Report. Urbana: U... Illinois, (November 1977).

Figure 3.

| # | Date | Title | Resp | Lesson Reviews |
|---|---|---|---|---|
| 18 | 2/15 | history | 2 | |
| 19 | 2/16 | gpa calculator | 8 | |
| 20 | 2/18 | metabolism less | 1 | |
| 21 | 2/19 | greek | 2 | |
| 22 | 3/3 | EKG lesson | 3 | |
| 23 | 3/4 | basic poli/sci | 6 | |
| 24 | 3/18 | new help lesson | 18 | What note?> |
| 25 | 3/21 | Rx | 3 | |

***End of Notes***

Press HELP for information
SHIFT LAB to write
SHIFT BACK to exit

*A Special Interest Notes file on "Lesson Reviews" contains critiques of various lessons. Note titles (e.g., "history") that help the potential reviewer to decide which notes to read.*

persons new to PLATO would type their complete name; subsequently, PLATO would inform them that they had not registered. (PLATO recognizes only those names that have been registered by PLATO personnel or instructors. A person's complete name is rarely used).

A PLATO user contributed a "Public Note" requesting input on a wording change. Some PLATO users who read the note responded by suggesting either that PLATO ask for a person's "code name" or a "PLATO name" (see Figure 2). It was finally decided that the system would request a person's "PLATO name." Thus, new users are now more aware that they are required to type a variation of their actual name to enter the PLATO system, and they are now more likely to ask for assistance when they are uncertain of their entry name.

The system maintains a PLATO library containing information files on lesson design and technique; lesson coding and routines; system consultants and computer operators; sample lessons; PLATO curriculum groups and lesson authors; publications in print; and curriculum modules.

## Group Notes for Special Interests

The PLATO system supports special-interest files called "Group Notes" that any site director can create. For example, authors can submit newly developed lessons for a file that other authors can review (see Figure 3).

An interpersonal-relations file allows PLATO users from various backgrounds to discuss any issue from sex discrimination to emotional depression. Users can be anonymous if they choose. The file director is the moderator and maintains the file. (Other special interest files are similarly maintained.) The file director has the option of allowing only members of a specific group to use the file.

Other special-interest files include an archive of humorous anecdotes related to PLATO's development; forums on law, religion, psychic phenomena, and science fiction; information exchanges on favorite recipes, collector's record albums, and rare comic books; a forum on the goals, means, and implications of space travel; and news of curriculum group activities, meetings, and lesson development.

"Student Note Files" are similar in format to special-interest files but are created to give students an opportunity to make comments concerning the lessons they use. These files can be used by students if they press the shift and term keys and type "comment." Usually the lesson's author or the student's instructor will see the comment. Students can thus offer their opinions; these may be used to revise lessons.

## Personal Notes

PLATO has established an electronic mail service in which authors and instructors can exchange "letters" called personal notes. For example, if a PLATO user would like to ask a question of a user at his own or another site, the user can write a personal note that would be sent automatically to the other user's PLATO record. Whenever the recipient of a personal note enters the system, PLATO will give notice that a personal note has been received.

A single keypress takes the note to the recipient. The recipient can read the signed note, and can send a reply. Smith and Sherwood have reported that more than a thousand personal notes are written daily on the PLATO system.[*] It is also possible to send personal notes to individuals using other PLATO systems.

Instructors with students using PLATO can send messages to their students. This is particularly useful to notify individual students or the entire class of forthcoming quizzes or conferences or of a particular lesson to be studied.

PLATO authors and instructors sometimes may want to communicate directly with each other by carrying on a silent conversation in which they simultaneously read and respond to each other's written communication. This feature works as long as the person being contacted is currently signed onto the system. The telecommunication link is easily initiated by pressing "shift" and "term," typing the word "talk," and then typing the person's PLATO name and course. The caller does not have to know the location of the paged person; the computer handles this. PLATO indicates whether or not the other person is available and will accept calls. The paged person receives a message at the bottom of the screen, which identifies the caller.

[*]Stanley G. Smith and Bruce Anne Sherwood, "Educational Uses of the PLATO Computer System," *Science* (April 1976): 344-352.

by PLATO name and by course. The telecommunication link is completed if the person being paged responds by pressing "shift" and "term" and typing the word "talk." This feature is particularly useful for on-line conferences.

Regular users often have their PLATO names listed as current users so that others will know that they can be paged. There is also a monitor feature helping "talkers" to show displays on the screen as a part of their conferences.

A conference communication capability also exists that allows several users, including students, to carry on simultaneous dialogue. An English instructor at Kennedy-King College in Chicago has used this capability to give students practice in writing and communicating.

### Journal Articles

A PLATO newspaper, supported by the system, appears from time to time; it contains articles on current events and CBE materials.

A medical editorial board has been established to review articles for possible publication in a scholary, PLATO-related medical journal so that medical students can learn of current developments in their field.

### Implications

The telecommunications network supported by the PLATO system allows people to talk with each other by way of the computer and to participate in the design and development of computerized lessons. It has contributed to the growth of PLATO curriculum, software, and hardware, as well as to increased involvement and interaction by its many clients. PLATO is an example of a sophisticated, participatory educational medium that encourages information exchanges, public forums, interpersonal communication, and a new form of journalism.

# COMPUTER ACCESS TO CHILDREN'S MEDIA

DAVID H. JONASSEN
THEODORE C. HINES
MARY FRANCES K. JOHNSON

An Office of Education grant under the Library Research and Development Act has provided the Library Science/Educational Technology Division of the University of North Carolina at Greensboro with funds for experimentation with a machine-readable data base for children's media.

The overall goal of this project is to use computer capabilities to augment information access to materials for children at the elementary school level in a number of different ways. This article discusses only our experience with computer searching (both on-line and batch) in relation to nonprint materials.

### Materials in the Data Base

Our data base is still quite small, consisting of cataloging and bibliographic information (including annotations and reading and/or interest levels) on fewer than 4,000 titles. Of these, about 1,500 are nonprint materials at all elementary school grade levels, in all commonly used formats except 16mm film. These formats include 8mm film, filmstrips, records, transparencies, cassettes, charts, slides, maps, games, sound filmstrips, and multimedia kits. At present, print titles in the data base are restricted to those useful with children at the preschool and early elementary grade levels.

Our eventual goal is to include all currently available materials at the elementary school levels included in such basic selective listings or recommended titles as the *Children's Catalog*, the *Elementary School Library Collection*, and *Booklist*. At present, the nonprint materials in the data base are restricted to those selected for the *Elementary School Library Collection*. (*Children's Catalog*, of course, lists only printed materials.) We are very grateful to the Bro-Dart Foundation, publishers of the *Elementary School Library Collection*, for permission to use their cataloging information, including the excellent annotations.

Although the present data base is small, it should be noted that it includes all nonprint media items and is the only monographic basic selection aid in the field that covers them. We estimate that the active available titles, print and nonprint, recommended in all of the basic selection tools represent not more than 15,000 items. Of these titles, we think it likely that not more than some 2,000 would be nonprint items. This estimate is based on consideration of annual production, in-print status, and the problems encountered by publishers of selection tools and by those who look over journals to find nonprint titles for review. Thus, the present data base is not so unrepresentative as might first appear.

While we are adding more access points for the materials than those provided by conventional cataloging, our experiences in doing this will be discussed elsewhere. Our concern here is with results that may be obtained by computer searching of quite conventional cataloging and bibliographic information.

### Link with Library of Congress

While we have used our own input format for reasons of economy, editing ease, and the ability to readily add information in addition to conventional cataloging data, our entries are linked to Library of Congress Machine Readable Cataloging (MaRC) records by inclusion of Library of Congress Card Numbers. We have a program that applies our search algorithms to MaRC tapes, and have received from the Library of Congress records for the well over 30,000 juvenile titles, at all grade levels, now included in MaRC. Our data base, however, includes a large number of titles, especially nonprint titles, not available in MaRC.

### A Variety of Searches

To date, we have conducted somewhat more than 200 searches in response to all kinds of requests from students, faculty, parents, day-care center staffs, and school and public libraries.

Because the data base is small, and because only parts of it usually need to be searched for any one request, it is possible for us to do serial searches—that is, to avoid having to construct the complex inverted files that would be required for random access to the various data elements.

The search algorithms provided for in our programs are quite complex, however. Searches may be made for character strings, words, or phrases in any or all or any combination of the data elements in the entries, using any Boolean relationship between or among terms.

### Low Costs and Easy Access

Costs for computer time for searches and hard-copy printout are low, averaging under five dollars per search. Output may be provided in 8½" x 11" paged format, with running heads, suitable for direct reproduction.

Of special value in relation to nonprint media searching is the fact that it is equally easy to retrieve listings of materials on given topics by physical form or media format—or without regard to their form—whereas a conventional catalog usually provides only one of these means of access. We can retrieve, obviously, all titles with a particular subject heading or author. We can also locate any title with a subject heading that has any given subdivision; AFRICA, for example. The latter access point is not, of course, possible in conventional cataloging.

Even more interesting is our ability to retrieve materials by searching for words or phrases in the annotations. A search for the word "ART" in annotations of materials at the early childhood level locates, for example, the filmstrip of Don Freeman's *Norman the*

*Doorman*, where neither the title nor the subject headings show that the story is set in an art museum.

This technique is particularly useful when a given item is not *about* a particular topic (and hence does not get that topic as a subject heading) but relates to that topic and may be used for a particular purpose. We have used it to locate materials with characters representing particular racial or ethnic groups or occupations, materials set in a given locale, and materials incidentally including objects of fascination to individual children—tractors, for example. In addition, it has been useful in locating materials of use in values education, or for materials for helping to deal with such familiar childhood situations as fear of the dark or sibling rivalry. In all of these instances we have located useful items we could not have found through conventional search techniques.

Such searches do not, of course, locate all possible useful titles, as they depend on the accident of inclusion of words in annotations. It is our own feeling that the nature of annotations may change somewhat as the use of computer searching becomes more general.

Many of our searches produce a high percentage of false drops—that is, items that match the search criteria but are not suitable for the purpose the searcher has in mind. In general, however, these may easily be identified by scanning the annotations in the output listing.

### Four Searching Aids

We have so far produced four printed lists that serve as searching aids, helping both to minimize false drops and to maximize hits. One is a classified list of used subject headings such as those about animals, community services, and so on. In this case every specific heading falling in a particular group is included. Another list gives all subject headings and subdivisions used together with their frequency of occurrence. The two final lists are frequency counts of the words used, respectively, in subject headings and in annotations. The latter is fascinating in some of its implications—"he" is far more frequent than "she", and "mother" more frequent than "father"—and permits very interesting searches; for example, for materials showing various emotions.

We believe our work so far shows that computer searching techniques may be economically, practically, and usefully applied to juvenile materials—perhaps especially useful for nonprint media.

*The authors acknowledge the very substantial contributions to this project of research associates Carol Walters, Jerry Warren, and Jane Martin, as well as those of our OE grant officer, Larry Papier.*

# MEDIA SCHEDULING AND REPORTING VIA COMPUTER

MICHAEL R. STOWERS

One of the most frustrating problems facing a media administrator is the scheduling of equipment, rooms, services, and people. Every agency has this problem and has solved it in any one of a number of ways: card systems, blackboard schedules, magnetic boards, or an overworked staff member with a great memory, for example.

At the University of Nevada, Las Vegas, the Audio/Visual Services Agency had tried these scheduling methods with only moderate success. Agency staff concluded that we needed to employ some means of data processing if we were to perform effectively and efficiently.

Our first venture in data processing started in the spring of 1973 when we began operating a computer-generated audiovisual activity report. This report displays in printed form the various services the agency provides to each department and its faculty or staff as well as any accumulated billing information needed to recover unfunded expenses. From the beginning, this system has been batch-oriented and run on a monthly basis in the computer-services section at the University of Nevada.

## Reporting Activities of the Agency

The success of the activity-reporting system has been shared through articles. In addition, 80 universities and colleges in the United States and Canada received a special report. Because we were encouraged by the report's reception, we established the following criteria for a daily scheduling system which would:

- not change drastically the existing system of forms or in-house scheduling activities;
- interface with the existing activity-reporting system;
- be capable of input by the student staff of Audio/Visual Services;
- provide a daily printed schedule or log of services to be performed;
- protect services, rooms, and equipment from overbooking or overscheduling;
- provide the ability to inquire into future dates or schedules; and
- be capable of changing or deleting previously scheduled activities.

The system, initiated on July 1, 1975, meets all these criteria.

Most requests for service enter the agency either as memos or telephone requests; telephone requests are the most popular. As the requests for services come in, we enter the information on a service form (Figure 1). If the request is for later service, we hold the form until the data-input clerk can code and enter the information in the system. This is done on a daily basis.

## Potential for daily scheduling

If someone requires immediate service, we can use the daily scheduling aspect of the system and enter

Figure 1

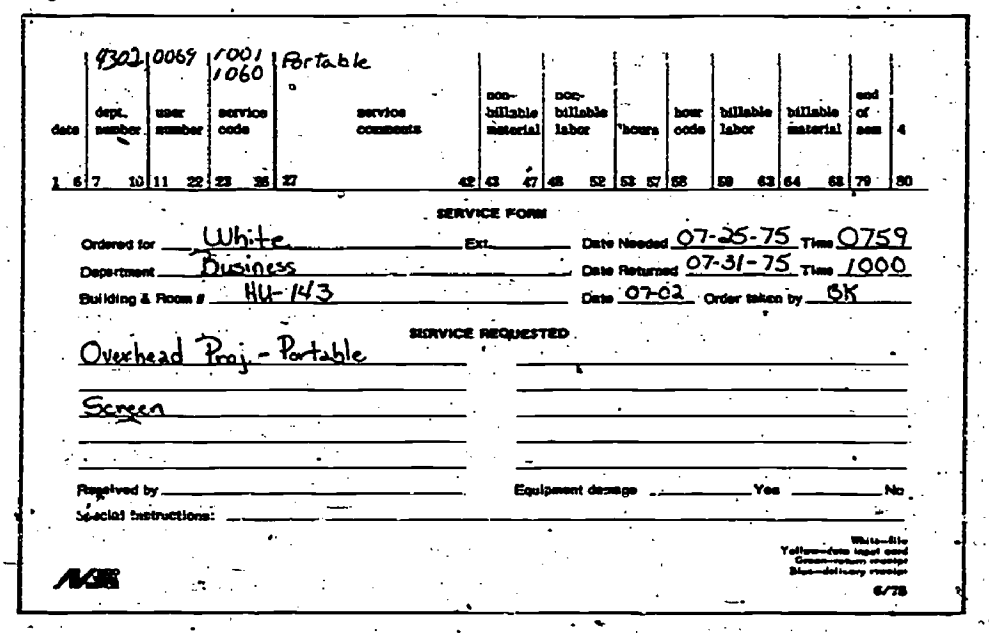
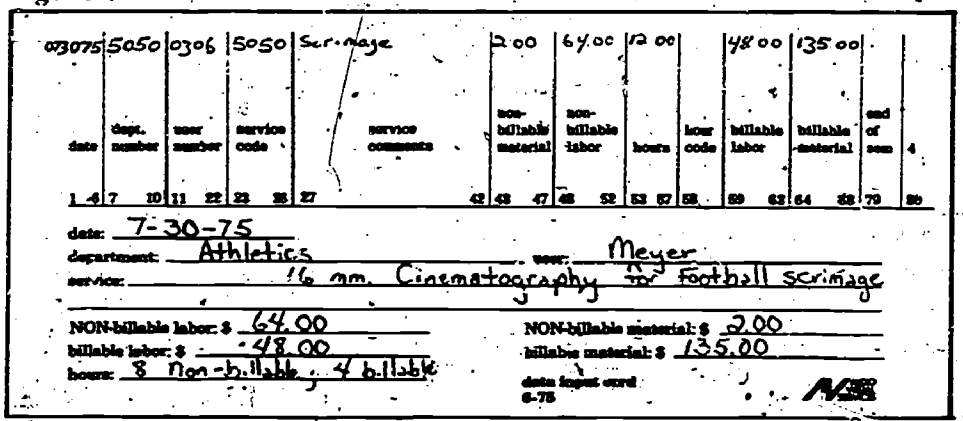



Figure 2




Note: *The boldfaced type in all the figures, indicates information that is entered by the terminal user; the lightfaced type is computer-generated.*

the request immediately. When we code individual forms, we use 4-digit numbers that the computer program recognizes as departments, users, or services. Each area has its own discrete series of numbers, a practice that allows 9,999 separate codes or listings in each of the three categories. Additional information can be provided as service comments or remarks.

Because our equipment and room-scheduling services are not on a chargeback basis, accounting information is not entered via terminal at the present time. For nonscheduled services or those requiring us to recover money, we complete and code a data-input card (Figure 2) and send it to the computer center for key punching. The computer center then holds the cards until it is notified that the monthly audio-visual activity report should be run.

### Access to the System

To have access to the entire system, we use a terminal with an acoustic coupler linked to the regular telephone system. After the data-input clerk is properly identified to the computer, the scheduling program is called up by typing in the word "-Run." From then on the program guides the operator through the necessary steps for adding, logging, or cancelling information in the system.

The following example displays the steps we take to enter services requested in Figure 1. The form has already been coded, showing that the College of Business has a department code of 4302 and that the user's code is 0069.

The requested services are an overhead projector coded 1060 and a screen coded 1001. Even though most overhead projectors are lightweight and are theoretically portable, this particular user has requested an overhead projector that is designed to be folded up in a suitcase. It is necessary, therefore, to add the word "portable" under "service comments."

### Adding Information to the System

Example A shows information (indicated by the bold-faced word, "ADD") to be added to the system. After the user types the terminal's "Return" key to enter a command, the program responds with the appropriate format for doing so.

```
ENTER "ADD", "LOG", "CANCEL", "DELETE", OR "END".
? ADD
ENTER NEW SERVICE REQUESTS BELOW IN THE FORMAT:
 DEPT,USER,EQUI,ROOM ,DELDAT,TIME,PU DAT,TIME,REMARKS. . .
? 4302, 0069, 1060,HU-143, 072575, 0759, 073175, 1000,PORTABLE
?              1001
?
```

Example A

```
TERMINAL:        34,TTY
RECOVER /SYSTEM:-RUN

ENTER "ADD", "LOG", "CANCEL", "DELETE", OR "END".
? ADD
ENTER NEW SERVICE REQUESTS BELOW IN THE FORMAT:
 DEPT, USER, EQUI, ROOM , DELDAT, TIME, PU DAT, TIME, REMARKS. . .
? 4050, 0012, 4001, ED-301, 071475, 0915, 071475, 1030
? 4356, 0352, 4001, CH-103, 071475, 1015, 071475, 1140
***DEMAND EXCEEDS AVAILABLE SUPPLY OF      1 FOR CLASS AV ORIENTATION.***

THE FOLLOWING REQUEST CANNOT BE HONORED:
4356 0352 4001 CH-103 071475 1015 071475 1140
?
ENTER "ADD", "LOG", "CANCEL", "DELETE", OR "END".
? CANCEL
ENTER SERVICE REQUEST TO BE CANCELLED IN THE FORMAT:
 DEPT, USER, EQUI, ROOM , DELDAT, TIME, PU DAT, TIME, REMARKS. . .
? 4050, 0012, 4001, ED-301, 071475, 0915, 071475, 1030
?
```

Example B

Once the basic information is added (as in Line 1—4301,0069, 1060), the operator need enter only the service codes for all additional services for that same place, date, and time. In this case, 1001 is added to request a screen for the overhead projector. Each time the program accepts a service, a question mark(?) is typed out to indicate acceptance of the information. The question mark also indicates that the user may now add the next service requested.

In example B we have tried to enter two requests for an audio-visual orientation session (code number 4001). However, the program only allows us to schedule one session at a time. Therefore, after accepting the first request (as indicated by the question mark) program does not honor the second request; the reason why is displayed on the terminal. The program's cancelling function can be seen in this example; it is identical to the "add" function except that the user does not need to enter remarks to cancel an event.

To call for a log (Figure 3) or schedule equipment for the next or any future day, the user types both "LOG" and "return." The program will then provide a format sequence indicating the day and hours to be logged.

### The Daily Schedule

To get a list of the entire day's schedule, the user need only type in month, day, and year, and tap the "return" key. If, however, as in the example, the user wishes to bracket a particular time (as in searching for a request to see if it has already been entered), the user enters the hour and minute of the earliest time the search can be made as well as the hour and minute of the latest time. The log that is received after tapping the "return" key on the terminal will not be a full day's log, but a log restricted by the times entered.

Figure 3 shows delivery at 7:59 a.m. of the overhead projector and portable screen requested in Figure 1.

When the operator has completed entering, canceling, and logging for a particular period during the day, the program is returned to a standby position by entering the word "END" and tapping the "return" key. All active tapes used in the pro-

```
ENTER "ADD", "LOG", "CANCEL", "DELETE", OR "END".
? LOG
ENTER DATE AND TIME OF LOG IN THE FORMAT:
  MMDDYY,HHMM,HHMM
?   072575,  0758,  0901

AUDIO VISUAL SERVICES DAILY LOG FOR 7/25/75.

TIME   SERVICE REQUEST        LOCATION  USER      DEPARTMENT
7:59   OVERHEAD PROJECTOR     HU-143 WHITE, W     COLLEGE OF BUSINESS
       PORTABLE               *DELIVER*
7:59   PROJECTION SCREEN      HU-143 WHITE, W     COLLEGE OF BUSINESS
       PORTABLE               *DELIVER*
8:00   PROJECTION SCREEN      HU-202 GRAZIANI     FOREIGN LANGUAGE
                              *PICK UP*
8:00   PROJECTION CART        HU-202 GRAZIANI     FOREIGN LANGUAGE
                              *PICK UP*
8:00   FILMSTRIP PROJECTOR   HU-202 GRAZIANI     FOREIGN LANGUAGE
                              *PICK UP*
9:00   AUDIO CASSETTE+MIC.    ED-228 BOORD, R     CURRICULUM+INSTRUC
                              *PICK UP*
9:00   HALF INCH VIDEO REC.   GR-114 HOLDER, T    ART DEPARTMENT
                              *DELIVER*
9:00   VIDEO MONITOR/REC.     GR-114 HOLDER, T    ART DEPARTMENT
                              *DELIVER*
9:00   TV CAMERA             GR-114 HOLDER, T    ART DEPARTMENT
                              *DELIVER*
9:00   PROJECTION CART        GR-114 HOLDER, T    ART DEPARTMENT
                              *DELIVER*
9:00   MISC. SERVICES        GR-114 HOLDER, T    ART DEPARTMENT
       2 REELS                *DELIVER*

AUDIO VISUAL SERVICES DAILY LOG FOR 7/25/75 COMPLETE.

ENTER "ADD", "LOG", "CANCEL", "DELETE", OR "END".
? END
```

Figure 3

gram are then returned and are put in a standby position until the next use.

## Reporting Activities

The "DELETE" function appearing in the option line is an aspect of the activity-reporting function of the system. Activity reporting began originally as an information system reflecting the amount and variety of services performed by the university's Audio/Visual Services. Activity reporting replaced an inefficient and time-consuming billing procedure.

We now have a reliable and credible activity report to display the output of the Audio/Visual Services Agency, and it has grown into a monthly public relations tool.

## Keeping Track of Costs

The report in Figure 4 shows services provided by the department and by departmental faculty and staff users as well as a cost breakdown by billable and nonbillable labor and materials.

Nonbillable information is recorded because most services are provided at no cost to the using department. It is to the agency's advantage, therefore, to record these costs: they are an indication to university administrators of the agency's total commitment and involvement in supporting instruction.

Billable information showing labor and material costs is also needed to recover funds from user departments for those services that are now unfunded or that must be charged back by university policy.

A monthly report on the system is sent to the Vice President for Administration (to whom the Director of Audio/Visual Services reports) as well as to the deans or directors of the colleges and campus agencies. The reports are reviewed with the Vice President for Academic Affairs on a semester basis. The report is run as a batch-input job from the University of Nevada System Computer Center.

## Retrieval of Report Information

When a report is required, an agency staff member writes a memo asking that the job be run and indicating the month and year to be covered by the report. The computer operator then loads the program, including any additions to the name, department, or service file and enters all of the keypunched cards reflecting nonscheduled or nonfunded requests (see Figure 2).

Then the program retrieves from the daily scheduling program the necessary monthly information and combines it with the keypunched cards; it then prints the report in triplicate.

After the monthly report is received by Audio/Visual Services, it is checked for accuracy and completeness. After distribution, the historical information is erased from the computer memory by typing the command to "DELETE" and indicating the date before which all requests may be deleted.

## Conclusion

The total system has been operating on a daily basis since July 1, 1975 and has not failed. It has increased the credibility of the Audio/Visual Agency in the minds of staff, faculty, and the administration.

Plans for the system's continuance have been made, and it appears that other campus agencies may adopt the program for their own scheduling needs. The complete system is under review by the media directors of the State Community College System and has been adopted by Clark County Community College.

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UNIVERSITY OF NEVADA - LAS VEGAS
AUDIO / VISUAL SERVICES ACTIVITY REPORT

75/08/12.

** CHEMISTRY

| DATE | USER | SERVICE RENDERED | | NONBILLABLE MATERIAL | NONBILLABLE LABOR | BILLABLE HOURS | BILLABLE CODE | BILLABLE MATERIAL | BILLABLE LABOR |
|---|---|---|---|---|---|---|---|---|---|
| 7/09/75 | MOORE, D | MISC. SERVICES | #4 MONITOR BOOTH | | 98.60 | 20.00 | | | |
| 7/30/75 | MOORE, D | MISC. SERVICES | TELEX HEADSET | | | | | 27.00 | |
| 7/24/75 | BURCH, B | AUDIO RECORDING | 8 CAS | 8.00 | 10.50 | 3.00 | | | |
| 7/28/75 | GOAD, J | AUDIO RECORDING | 10 CAS | | 7.00 | 2.00 | | | |
| 7/29/75 | MOORE, D | AUDIO RECORDING | 18 CAS | 18.00 | 14.00 | 4.00 | | | |
| 7/18/75 | HANFORD, B | MISC. SERVICES | FILM CATALOGS | | | | | | |
| 7/10/75 | JOUBERT, J | 16MM PROJECTOR | | | | | | | |
| 7/10/75 | CARLSON, R | 16MM PROJECTOR | | | | | | | |
| 7/10/75 | HANFORD, B | OPERATOR SERVICE | | | | | | | |
| 7/10/75 | COOK, B | OPERATOR SERVICE | | | | | | | 12.00 |
| 7/05/75 | CROSBY, C | PROJECTION SCREEN | | | | | | | |
| 7/07/75 | ALSUP, W | PROJECTION SCREEN | | | | | | | |
| 7/03/75 | SMITH, J | AUDIO CASSETTE+MIC. | | | | | | | |
| 7/07/75 | SMITH, J | AUDIO CASSETTE+MIC. | | | | | | | |
| 7/03/75 | CARLSON, R | DISSOLVE SLIDE UNIT | | | | | | | |
| 7/07/75 | JOUBERT, J | DISSOLVE SLIDE UNIT | | | | | | | |
| DEPARTMENT TOTALS/THIS MONTH : | | SERVICES SUPPLIED | 16 TIMES | 26.00 | 130.10 | 29.00 | 27.00 | | 12.00 |
| THIS YEAR : | | | 42 TIMES | 35.40 | 229.01 | 73.10 | 49.33 | | 12.00 |

NOTICE NOTICE NOTICE NOTICE

**PLEASE USE THE FOLLOWING STEPS IN PROCESSING THE ACCOMPANYING INTER-DEPARTMENTAL REQUISITION (IDR)**
1. PLEASE HAVE YOUR DEPARTMENT HEAD, DEAN, OR ADMINISTRATIVE OFFICER SIGN THE ATTACHED INTER-DEPARTMENTAL REQUISITION (IDR).
2. ENTER AN ACCOUNT CHARGED NUMBER.
3. DETACH YOUR OFFICE COPY (PINK) AND DEPARTMENTAL COPY (BLUE).
4. RETURN IDR TO AUDIO-VISUAL SERVICES, HU-143.

THANK-YOU

BY SERVICE :

| | "THIS MONTH" | "THIS YEAR" |
|---|---|---|
| 0004 MISC. SERVICES | 3 | 5 |
| 1001 PROJECTION SCREEN | 2 | 2 |
| 1050 16MM PROJECTOR | 2 | 11 |
| 1101 OPERATOR SERVICE | 2 | 9 |
| 1221 AUDIO CASSETTE+MIC. | 2 | 7 |
| 1251 DISSOLVE SLIDE UNIT | 2 | 3 |
| 7007 AUDIO RECORDING | 3 | 7 |

Figure 4

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