R E P O R T R E S U M E S

ED 019 847 EM 000 213

TELEVISION RECORDINGS AND TEACHER EDUCATION--NEW DIRECTIONS.

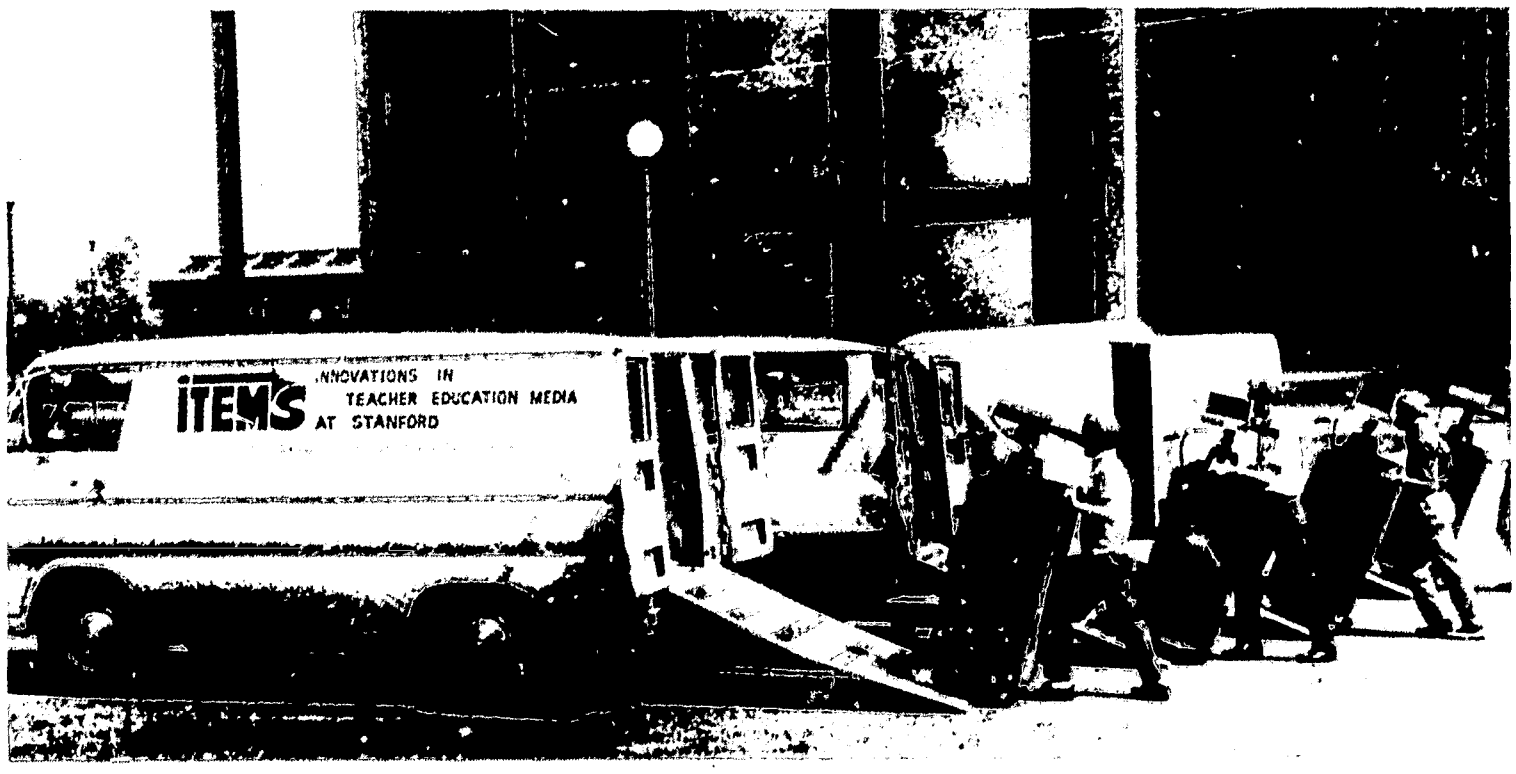
BY- PINNEY, ROBERT H. MILTZ, ROBERT J.
STANFORD UNIV., CALIF., STANFORD CTR. FOR R. AND D

EDRS PRICE MF-$0.25 HC-$1.08 25P.

DESCRIPTORS- TELEVISION RESEARCH, *TEACHER EDUCATION, *TEACHER INTERNS, *VIDEO TAPE RECORDINGS, *MICROTEACHING, FEEDBACK, COSTS, *TEACHING SKILLS, SKILL DEVELOPMENT, BEHAVIOR CHANGE, SUPERVISORY TRAINING, EDUCATIONAL RESEARCH,

THE STANFORD SCHOOL OF EDUCATION HAS BEEN USING PORTABLE VIDEO TAPE RECORDING SYSTEMS FOR A VARIETY OF NEW INSTRUCTIONAL AND RESEARCH PURPOSES. DURING PRESERVICE TRAINING, TEACHER-INTERNS USE SPECIFIC SKILLS TO GIVE SHORT LESSONS WHICH ARE VIDEOTAPED AND REVIEWED IMMEDIATELY WITH A SUPERVISOR. TEACHER-INTERNS ARE LATER VIDEOTAPED UNOBTRUSIVELY IN THEIR CLASSROOMS FOR FEEDBACK ON CLASSROOM PERFORMANCE. A NEW INTERN PROGRAM TRAINS INTERNS IN VIDEO TAPE OBSERVATION, AND THEN DEMONSTRATES SPECIFIC SKILLS THROUGH VIDEO TAPES OF EXPERIENCED TEACHERS, FOLLOWED BY INTERN PRACTICE. A STUDY OF SUPERVISORY TECHNIQUES REVEALS THAT USE OF VIDEO TAPE RECORDINGS CAN INCREASE THE SUPERVISOR'S ABILITY TO CHANGE SUBSEQUENT RECORDED TEACHER BEHAVIOR. RESULTS OF A STUDY ON TEACHER SELECTION SHOW THAT A FIVE MINUTE VIDEOTAPED LESSON CAN BE AS RELIABLE A PREDICTOR OF SUBSEQUENT TEACHING PERFORMANCE AS THE NORMAL LENGTH INTERVIEW PROCEDURE. VIDEO TAPE RECORDINGS CAN ALSO BE USED FOR SUPERVISION OF EXPERIENCED TEACHERS, FOR SUPERVISOR TRAINING, FOR PRERECORDED SUBSTITUTE LESSONS, AND FOR REMOTE SUPERVISION. A SPECIAL SYSTEM FOR SINGLE SCREEN VIEWING OF BOTH TEACHER AND STUDENTS IN BEING INVESTIGATED. COMPONENT AND COST DESCRIPTIONS ARE INCLUDED, WITH PHOTOGRAPHS. (BB)

TELEVISION RECORDINGS AND TEACHER EDUCATION: NEW DIRECTIONS



ROBERT H. PINNEY AND ROBERT J. MILTZ

TELEVISION AND AUDIO VISUAL CENTER
SECONDARY TEACHER EDUCATION PROGRAM
CENTER FOR RESEARCH & DEVELOPMENT IN TEACHING
SCHOOL OF EDUCATION

STANFORD UNIVERSITY

The systematic development and utilization of television recordings has added a new dimension to the preparation of secondary school teachers at Stanford University. The diversity of videotape-recordings made in teachers' classrooms and the university micro-teaching clinic continue to provide both supervisors and teachers with a common frame of reference for discussing teaching performance.

The increased reliability, flexibility, and portability of carefully designed partable videotape-recording systems has made them a valuable adjunct to the research and development program at Stanford University. The utilization of this resource, initiated by Dwight W. Allen and David B. Young, represents only one of many possible applications.

The experiences of the Stanford School of Education staff indicate that the advantages to the educator interested in research and development in teacher education or classroom observation are limited only by his imaginative consideration of the media's potential.

Development

In February 1963, after preliminary work indicated the feasibility of the equipment, the first production model portable video recorder became a part of Stanford's experimental teacher education program, supported by the Ford Foundation.

During the Spring Quarter of 1963 both teacher-interns and experienced teachers were recorded to further test the feasibility of using the recording equipment

in the classroom. Subsequent interviews led to the conclusion that teachers do profit from viewing their own teaching performance. It was also demonstrated that a non-technician could operate the unit and that its presence in the class was relatively unobtrusive.

Based on these experiences the School of Education was successful in obtaining support from the Kettering Foundation for the continued development of micro-teaching and portable television recording systems. Presently, the Stanford Center for Research and Development in Teaching is conducting a variety of studies involving the use of micro-teaching and television recordings. Results of these studies are available through the Center.

CURRENT USES OF TELEVISION RECORDINGS

Pre-Service Micro-Teaching

Micro-teaching is a scaled-down teaching encounter in which interns have the opportunity to gain systematic experience in specific technical skills of teaching under focused supervision.

An intern's first experience with videotape occurs on the initial day of the Summer Quarter. In the past summer, one hundred sixty-five interns taught five and forty-minute diagnostic lessons which were recorded on videotape for future comparison. The five-minute lesson, chosen by the intern from his own teaching field, was taught to a group of four high school students. The forty-minute lesson was taught to twenty five students. Immediately following each recording the intern viewed his performance with his supervisor. The supervisory remarks during the

diagnostic session are primarily of an encouraging nature.

During the first three weeks of the micro-teaching clinic interns teach two to three lessons per week which are videotaped. The intern teaches a lesson and then views the recording of the lesson with his supervisor. Following this critique period, the intern reteaches the same lesson which is again recorded, viewed, and critiqued. Each time the intern teaches the lesson to a different group of students, who, in turn, give the teacher feedback in the form of ratings or comments.

Central to the process of micro-teaching is the fact that each teach-reteach sequence emphasizes a specific technical skill of teaching. That is, specific training is given the intern relative to the skill, with the supervisory session and viewing of the videotape focused upon the skill in question. Teaching skills such as reinforcing student responses, asking probing questions, varying the stimulus situation, using silence, repetition as a lecturing skill, and others are continuously being identified, and training protocols developed.

For the final three weeks, the interns are grouped as to subject matter areas and cooperatively plan and teach a unit of 20-minute lessons. Each intern teaches four to six of these lessons, which are critiqued as described above, with the added dimension of colleague supervision.

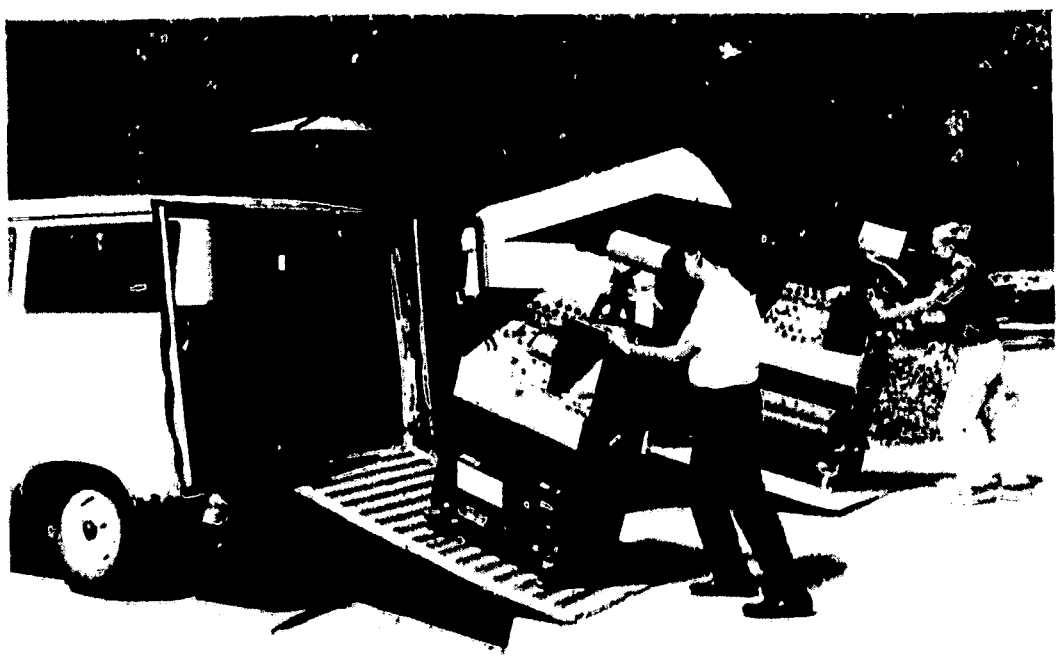
During the last week of the clinic all interns again teach, have recorded, and critiqued, a five and forty-minute lesson, which can then be compared with their initial diagnostic and future classroom recordings.

Although each intern has thirty recordings made per summer, the use of videotape-recordings is actually independent of the micro-teaching program. That is,

TRANSPORTATION

Pictured below is a portion of the 1600 rolls of videotape used in the Television Project. Videotape is available from several manufacturers, all of about equal quality and dependibility.

The photographs above and below portray the means used to transport the video-tape-recording units from Stanford to the public schools. The two trailers and truck ramps were custom designed and built at Stanford for the Television Project. Specifications are available.



To the right is a photograph showing the three-wheeled appliance truck used for moving the carts up stairs in those schools without elevators. The "walking" action of the clustered wheels makes it possible for one man to move the cart up stairs.

micro-teaching can be effective without the feedback provided by the videotape. However, supplementing micro-teaching with videotape feedback makes the clinic experience even more powerful as a training protocol.

Field Recordings

During September all interns are recorded for the first time in their own classrooms, in the cooperating schools. Throughout the year a total of eight to fifteen classroom performances and several micro-teaching sessions are recorded. The teachers are advised in advance of the recording and are instructed to proceed with their normal lesson (but to avoid scheduling films or tests on this day).

A single operator rolls the cart into the classroom and places it in the rear of the room during the passing period between classes and is actually able to prepare the equipment for recording during this 4-5 minute period. The operator will then record a 15-20 -minute segment of the lesson which has been predetermined by the teacher, supervisor, or the design for a study. Early in the use of videotape recordings, longer segments were taped, but it was found that little additional information was obtained from the relatively longer time, effort and expense required. The portable television recording units utilized in the micro-teaching clinic and the classroom recording of interns are self-contained with all the components installed in a 20 inch by 30 inch by 45 inch wood-formica cart, mounted on casters. The vidicon camera is mounted on a removable board which sits atop the cart. The recorder is shock-mounted in the bottom of the unit. The console contains a small 5-inch monitor, a mixer-amplifier, and a wireless microphone with receiver. All components are wired to the patch panel on the console, reducing the number of connections necessary for operation. The operation of the unit has been simplified

T.V. RECORDINGS & THE CLASSROOM

Pictured above and to the left is the portable recording unit as it appears in a typical classroom during field recording. Notice that the unit is free from any appratus visible to the students. Also note that the college-student operator is not looking at the teacher-intern through a distracting viewfinder camera. Normal set-up time is four minutes.

The photograph at the right shows an intern and supervisor viewing the intern's teaching performance as recorded the day before. The recording provides an opportunity to observe the lesson in a manner most helpful to the intern.

to the point that one college undergraduate can roll it into the classroom and prepare it for recording in four minutes. Due to the absence of multiple microphones, multiple cameras and additional lighting, the recording procedure is relatively unobtrusive in the classroom. Pictures and approximate costs of the various systems appear throughout in this article.

Supervisory Techniques

"I didn't know that I paced around the room so much." "I'll never put my hands in my pockets again." These are typical remarks following a teacher's first viewing of his performance. However, these "cosmetic" considerations quickly give way to matters of relevance to the teaching act once the teacher has had the opportunity to view himself the second time.

Stanford research finds that various supervisory styles result in increased changes in teaching behavior when accompanied by television recordings. Keith Acheson, the first coordinator of videotaping at Stanford, concluded in his study of supervisory techniques, with and without the use of videotape, that the addition of television recordings to both direct and indirect styles of supervisory conferences increased the supervisor's ability to change specific teacher behavior as observed in a subsequent recording.

The videotape medium offers a supervisor the opportunity to immediately reinforce desirable teaching behavior by simply offering such comments as "That is a good thought-provoking question," "You developed that point particularly well," or he may begin, "Did that point develop as well as you had planned?" To this the intern might reply, "No, the students didn't seem to follow my example on the board."

The supervisor would then say, "Let's stop the tape at this point and return to where you first introduced the subject and look again at the way you developed it, and also consider alternative presentations.

A recently completed study by David B. Young found that contingent supervisory remarks recorded on a second sound track, played back simultaneously with original classroom recordings, produce significant changes in teacher behavior on the lecture skills of repetition and redundancy.

Current Television Recording Studies

Through a grant from the U.S. Office of Education, several studies are currently underway to determine additional training effects of feedback and modeling procedures in teaching performance.

The current question facing innovative teacher education programs is no longer whether to use television, but how to maximize its effectiveness. Experience indicates that some of the most obvious ways to incorporate television into teacher training do not fully capitalize on the resources which television offers.

For example, using television as a labor saving device and in an observation program that is merely a replica of what has been done traditionally is an enormous waste of technological resources. Such an application of television would be analagous to using sophisticated computer facilities to schedule a student body in a school where the curriculum has not been revised for twenty-five years and which maintains the traditional "lock-step" schedule. In both instances a powerful new tool is applied to an outworn model. The obvious alternative is to examine the new resources and ask how they would allow for the revitalization of the old model or the creation of a completely new one.

Through the Stanford Secondary Teacher Education Program (STEP) experimentation is being conducted to determine ways to use television in a new design for the intern observation program. The new model departs from the traditional observation program in a number of key ways. Instead of sending interns to the local schools, experienced teachers are brought to the interns via video recordings. In contrast to the generic unfocused observations characteristic of many traditional programs, each video tape that the interns view presents an experienced teacher demonstrating a specific technical skill of teaching. Moreover each intern is given training in order to strengthen his ability to view a model tape perceptively. Each observation session is made purposeful for the intern by subsequently having him practice the skill he has seen demonstrated on the video tape. Finally, because the entire observation program is carried out at Stanford under controlled conditions, the program can be used as a vehicle for doing research on the effective utilization of television. Thus we can constantly ask how to best utilize the resources of television, put that question to empirical tests, and use the insights gained to refashion the design of the program.

Teacher Employment

With a cooperating school district (Fremont Union High School District, Sunnyvale, California) the Secondary Education staff investigated alternative methods of selecting new teachers. Each applicant for a teaching position was required to teach a five-minute micro-lesson which was recorded on videotape, rated by high school students, and appraised by Stanford supervisory personnel. The teacher had the alternative of teaching more than one lesson and indicating which one he would prefer to have as a record of his performance. Micro-teaching ratings were not used as

criteria for employment but were later compared by STEP personnel, with the normal performance ratings of the teachers (employed by conventional methods) at the end of the school year. Results indicate a 5-minute lesson is as reliable a predictor of subsequent teaching performance as is the normal length interview procedure. The Stanford ratings of the 5-minute lessons correlated highly with end-of-the-year supervisor ratings.

Supervision Training

Another school district (Campbell Union High School District, San Jose, California), cooperated with Stanford in an appraisal of television recordings as one part of a supervisory training program that was to focus upon the supervision of experienced teachers. Principals in each of the schools of the district selected teachers with whom they wished to work. Twenty-minute recordings were then made and played back for the teacher and the principal, and a supervisory conference immediately followed. The principal followed up on this supervisory conference with a later visit to the classroom to assess the results. Concurrent seminars were held at which time personnel from Stanford demonstrated techniques of using television recordings and discussed with the supervisory staff various methods for the effective appraisal of teacher competence.

Principals and other seminar participants were enthusiastic about the possibilities of using television recordings in supervision as well as for orientation activities and instructional purposes.

Micro-teaching and videotape recordings are also being utilized in the Peace Corps Philippine Project, the Federal Teacher Corps project and various other organizations involving peronnel training programs.

SPECIAL EFFECTS

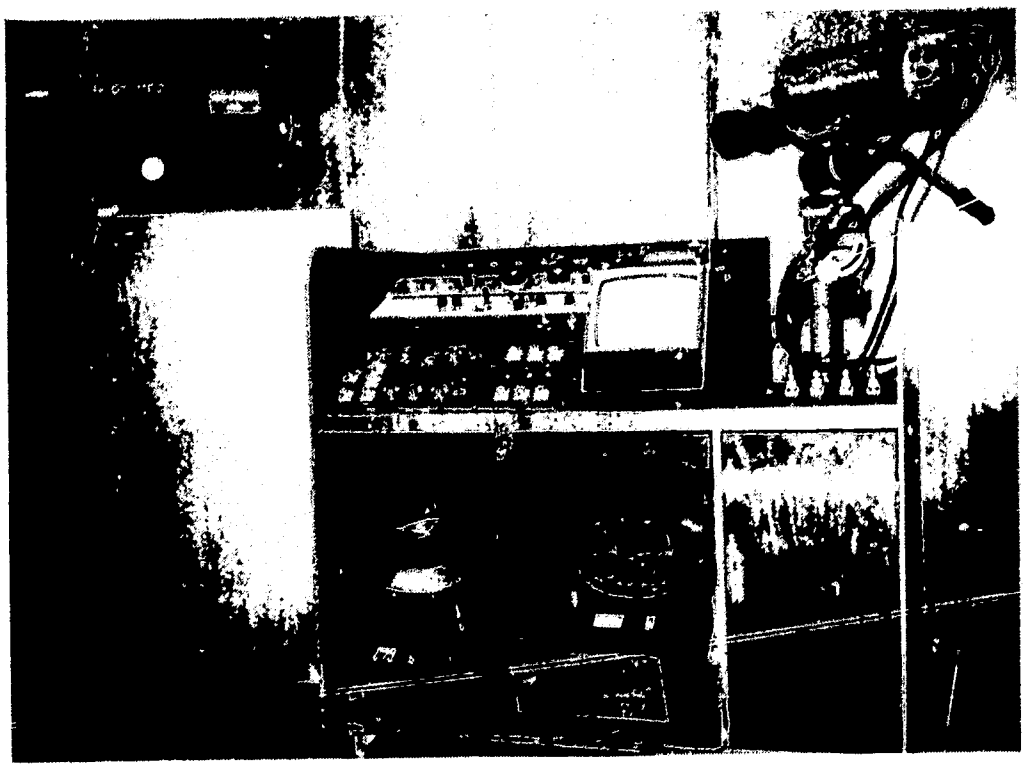
Stanford is currently studying the efficacy of showing both the teacher and pupils on the TV screen simultaneously. Originally the split screen "effect" was achieved by marking off alternate portions of the vidicon tube of two cameras. Recently, a special effects generator has been purchased to study this new technique in teacher education in a more sophisticated manner. The special effects unit receives impulses from two separate cameras, one situated in the front of the room focusing on the students and the other at the back of the room concentrating on the teacher. The generator mixes the two impulses to make one composite picture. The screen can be "split" vertically, horizontally, or by quadrants.

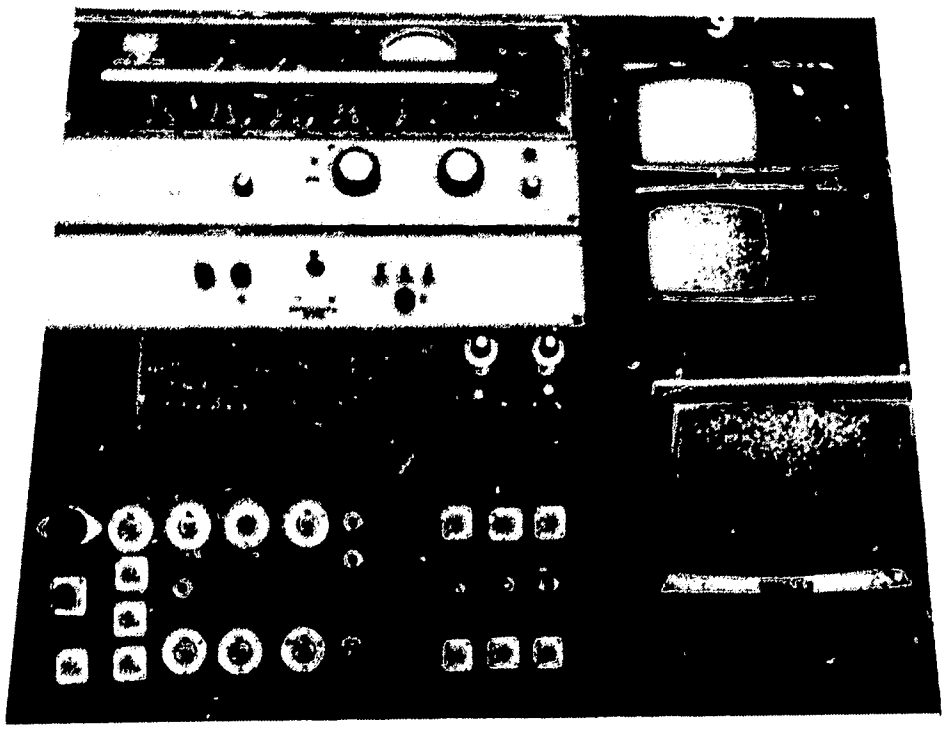
Due to the complex technical aspects of this sytem it is not advocated that split-screen recording be considered as a replacement for the conventional method of recording depicted in this paper. This special technique has been developed as a supplement.

Pilot work has been done in studying the attending behavior of the class and individual pupils in the context of the total class. With the split screen the attending behavior changes can be related to the performance of the teacher at any one time throughout the class period. There is also potential for studying that all too elusive problem -- discipline. We now have the capability of looking at the effects of the teacher on the student, while at the same studying the effects of the students on the teacher. Only the imagination of the researcher using the special effects system can limit the potential use of a video tape that is capable of simultaneously showing the actions and reactions of the teacher and students.

THE SPECIAL EFFECTS SYSTEM

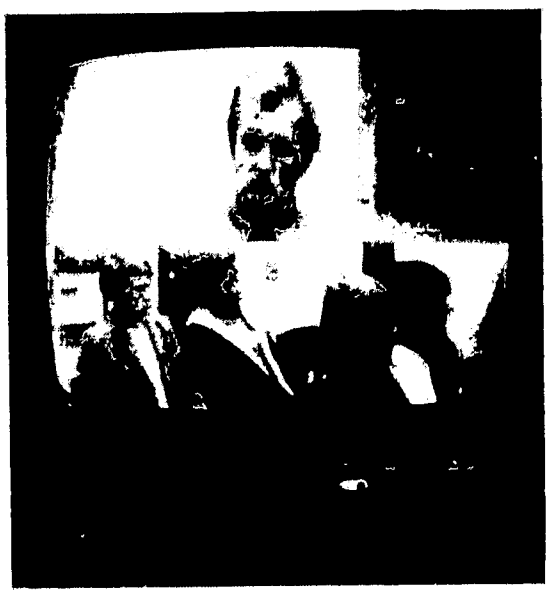
At the right is pictured the Special Effects System used at Stanford. Custom designed, it has the added features of a remote controlled pan, tilt, and zoom, plus a "special effects generator" for use in "split screen" situations. (This allows for the simultaneous viewing of both teacher and student behavior.) The System is designed to maximize flexibility of operation and application. Slightly larger than the Basic Cart, it is none the less operable by one man.





At the left is a close-up of the Special Effects System console. Observable are the remote control panel, special effects control panel, monitors for each camera, and a larger "composite" monitor. Room is available for the installation of a wireless receiver or other components.

The photograph at the right exemplifies one of the uses of the special effects generator--the simultaneous viewing of student and teacher behavior. The screen can be "split" vertically, horizontally, or by quadrants.



SELECTED OTHER USES OF TELEVISION RECORDERS

There are many ways in which television recording equipment can be utilized, and new applications are constantly being identified. The following projected uses appear to have considerable merit, although the list is not complete.

Substitute Teachers

To ease the instructional problems associated with teacher absences it is proposed that supplemental lessons in each subject matter field can be prepared by regular teachers and recorded on videotape. These lessons could then be presented to the appropriate class in case of an absence in a particular department. The lesson would probably be 20-30 minutes in length and could be open-ended in nature or end with a specific assignment for which students could do independent research under the guidance of a paraprofessional.

Inter and Intra-visitation

The use of television recordings solves logistics problems and in addition provides the opportunity for a supervisor to view the recording with the teacher and to focus his attention on the relevant teaching behavior. The advantages for colleague supervision programs are obvious, also.

Instructional

The possibilities for using television as an instructional aid are far too extensive to be adequately discussed in this report. However, portable equipment such as that developed at Stanford, permits the teacher to bring a "field trip" or an outstanding authority to the classroom with increased ease. The same equipment

can be utilized to project demonstrations in biology or chemistry so that each member of the class has a "front-row seat." The videotape medium has also been used effectively in group and individual counseling. In short, the applications of portable videotape recordings to instructional procedures are virtually limitless, those listed here being merely the obvious.

Senior Staff Supervision

The portable videotape-recorder contributes to the more efficient use of staff time by bringing a teacher's performance to the university via videotape. This allows one professor to critique the performances of several teachers in less time than he could have spent traveling to even one school. For longitudinal appraisal a professor might view at one time a series of taped performances of one teacher over several months duration, commenting on relative progress. The second sound track feature of most portable videotape recorders makes such a process feasible.

Supervisor Training

The video record is a good stimulus for the training of supervisors for it enables a large group of supervisors to view the same teaching performance and thus arrive at a common frame of reference for observation. When disagreement occurs, reliability of observations can be improved by replaying the episodes in question.

A library of video tapes depicting various levels of teaching performance in the different disciplines has proven to be valuable in training the novice supervisor.

The long standing difficulty vis a vis differences in philosophy between university supervisors and resident supervisors in the local schools where practice teaching or internship takes place, can be confronted and at least partially resolved through common

viewing of video excerpts. Where differences remain, supervisors can still view the same teaching performances on video tape and arrive at increased consensus regarding the interpretation and utilization of criteria.

Remote Supervision

The concept of remote supervision permits teachers located in distant schools to receive supervisory assistance from the senior staff. A teacher can have a recording made of his performance and send the tape to the university, state department of education or district office. A senior supervisor or colleague can then view the recording and add supervisory comments on a second sound track of the videotape without erasing the original information. The tape would be returned to the teacher for his viewing and review of the comments.

COMPONENT AND COST DESCRIPTION

Following is a component and cost description of the various items of portable video tape-recording equipment used in conjunction with the Stanford Teacher Education Program and the Stanford Center for Research and Development in Teaching. This description does not cover all of the equipment of this type that is available or desirable for the person interested in the use of portable video tape-recordings in education. The components listed here include those used in the Stanford projects and reflect our experience with such equipment. This does not constitute en endorsement of the equipment listed. Further information is available upon request.

Three criteria regulated the development of the various recording units currently in use at Stanford:

A. Each unit must be of such size, weight, and simplicity as to be movable and operable by a non-technician (college or high school student), and placed in the rear of a classroom without moving the existing furniture.

B. Each unit must have the capability to be readied for recording within the customary five-minute class intermission.

C. The operation and set-up of the unit must be unobtrusive in the classroom.

The units described herein meet these criteria.

BASIC CART CONSTRUCTION

A. 30" x 20" x 44", mounted on 3" rubber/braked casters.

B. Internal wiring and connection of all components, terminating at a control panel on the operator's side of the cart. The front side of the cart is free of any visible apparatus.

C. A pull-out drawer for cords, accessories and supplies.

D. Shock mounting of all components, (mixer, 5" monitor, Vega, etc.)

E. COST (Materials only: ----------$200.00

(Plans for the basic cart are available. Modifications can be made as necessary for any intended application.)

SYSTEM "A" (Deluxe)

RECORDER: The most widely used recorders are those manufactured by Ampex and Sony, Either brand is acceptable although we have had the most experience and dependability with the Sony.

1. Sony EV-200 -- fast forward, dual soundtrack, small and compact ---------- $3550.00
2. GE 230 (same as EV-200, but marketed by GE)---------- $3495.00
3. Ampex 7000 ---------- $3450.00
4. Ampex 7500C (w/ color capability) ---------- $4495.00

CAMERA: Many are available and at various prices.

1. GE TE20 ---------- $1595.00

ZOOM LENS: Many are available.

1. Angenieux Lens 150mm. to 15mm. Zoom ---------- $795.00

HEAD?MOUNT: Tripods, columns, etc. are also available.

1. Hercules "Hi-Hat" #4033 ---------- $25.00
2. Miller Fluid Head #DB Senior ---------- $150 .00

CART MONITOR:

1. Sony PVJ 305 (with receiver, 5" screen) ---------- $260.00

MICROPHONE: Many are available

1. Shure 546 (shock mount, dual impedence and Atlas CS-1 Stand-- $100.00
2. Vega Wireless microphone and receiver ----------$550.00

MIXER:

1. Altec 156A with transformers ----------$300.00

EARPHONES:

1. Telex MR6 ---------- $10.00

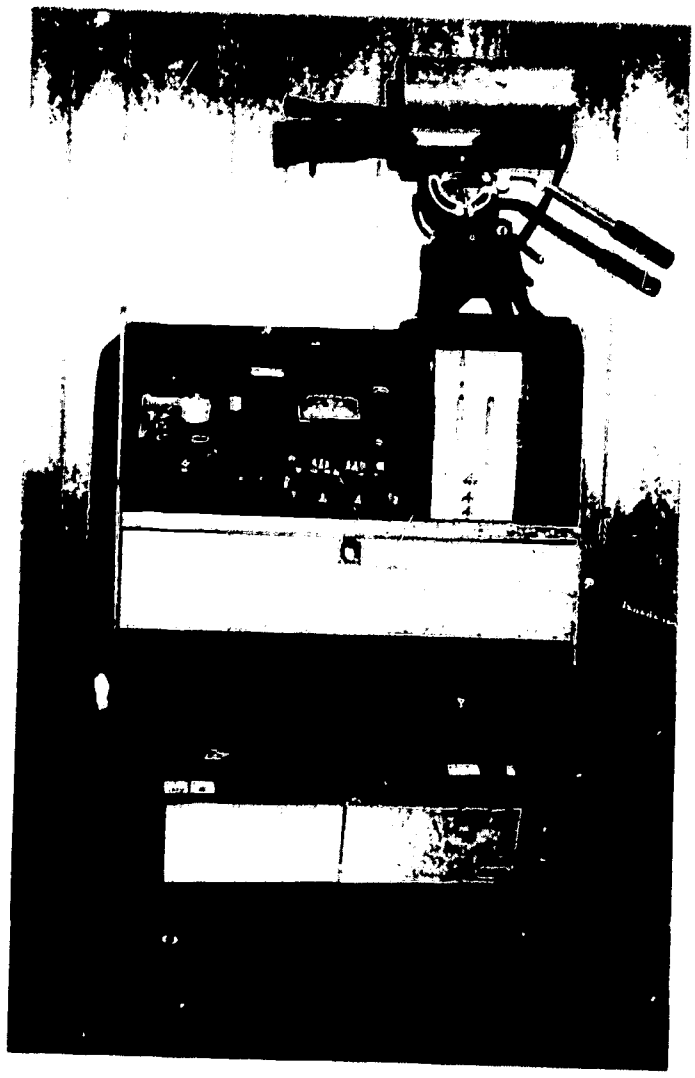
PLAYBACK MONITOR:

1. Conrac CEA25/Y, with amplifier and speaker ---------- $500.00

MONITOR CART:

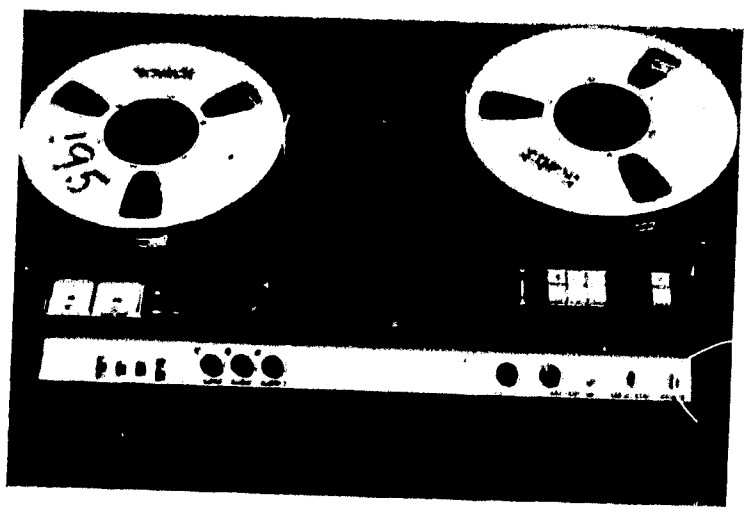
1. Pixmobile ---------- $65.00

THE DELUXE SYSTEM



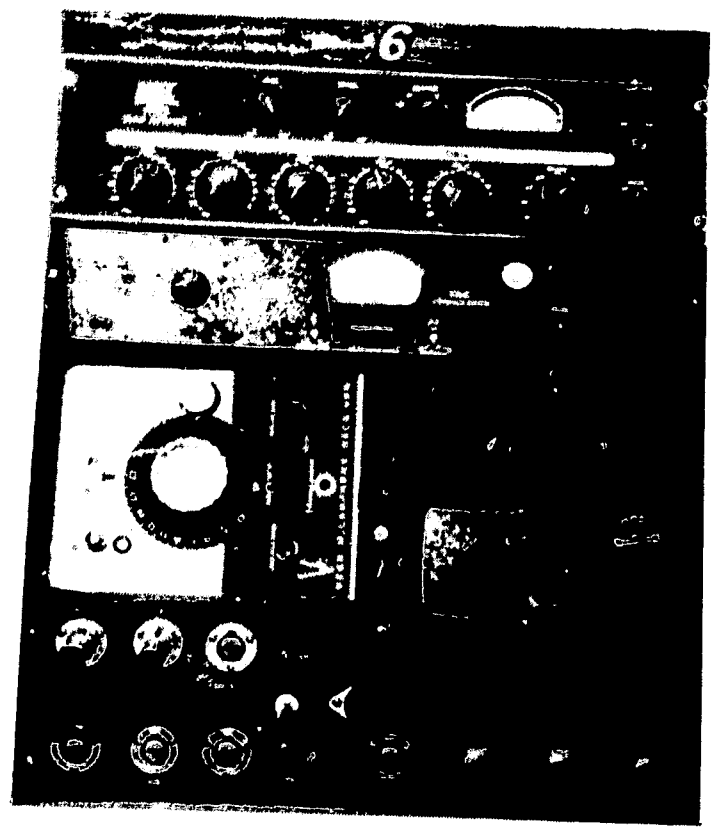
The above photograph shows the complete Deluxe portable recording unit which is used in the micro-teaching clinic and in public schools.

Plans for the cart are available.



The photograph above shows the MVR65 which, like any recorder chosen for use, is mounted in the bottom of cart. The design of the cart is flexible so that most popular recorders can be accomodated.

Above is the Conrac 25" monitor used as a playback station with the Deluxe System.



Pictured above is a close-up of the recording unit console. Included in the Deluxe System is a mixer-amplifier, compression amplifier, wireless receiver, 5" monitor, and a patch panel for connection to external equipment.

VIDEO TAPE: Several brands are available at same approximate cost.

1. 3600' (90 minutes) ---------- $75.00
2. 2400' (60 minutes) ---------- $54.00
3. 1200' (30 minutes) ---------- $35.00

TOTAL APPROXIMATE COST w/Sony EV-200 or Ampex 7000 ---------- $7900.00

+ tape

SYSTEM "B" (Basic)

RECORDER: (see note, System A)

1. Sony EV200 ---------- $3550.00
2. GE 230 ---------- $3495.00
3. Ampex 7000 ---------- $3450.00
4. Ampex 7500 ---------- $3995.00

CAMERA:

1. Ampex CC324 w/3 lens turret (auto. adju.) ---------- $995.00
2. Shibaden HV 13 ---------- $450.00
3. Concord MTC15 (auto. adju) ---------- $350.00

LENS:

1. One each of close-up, med. angle, and wide-angle for use with the CC324 ----------approx.----- $400.00
2. BC (Conscimar) 22.5mm x 90mm Zoom ---------- $295.00

HEAD/MOUNT:

1. Hercules "Hi-Hat" #4033 ---------- $25.00
2. Miller Fluid Head #DB Senior ---------- $150.00

CART MONITOR:

1. Sony PVJ3030 (without receiver, w/ 5" screen) ---------- $215.00

MICROPHONE:

1. Shure5458 withAtlas CS-1 Stand ---------- $80.00

MIXER:

1. Altec 1567A with transformers ---------- $300.00

EARPHONES:

1. Telex HFY 91 ---------- $7.50

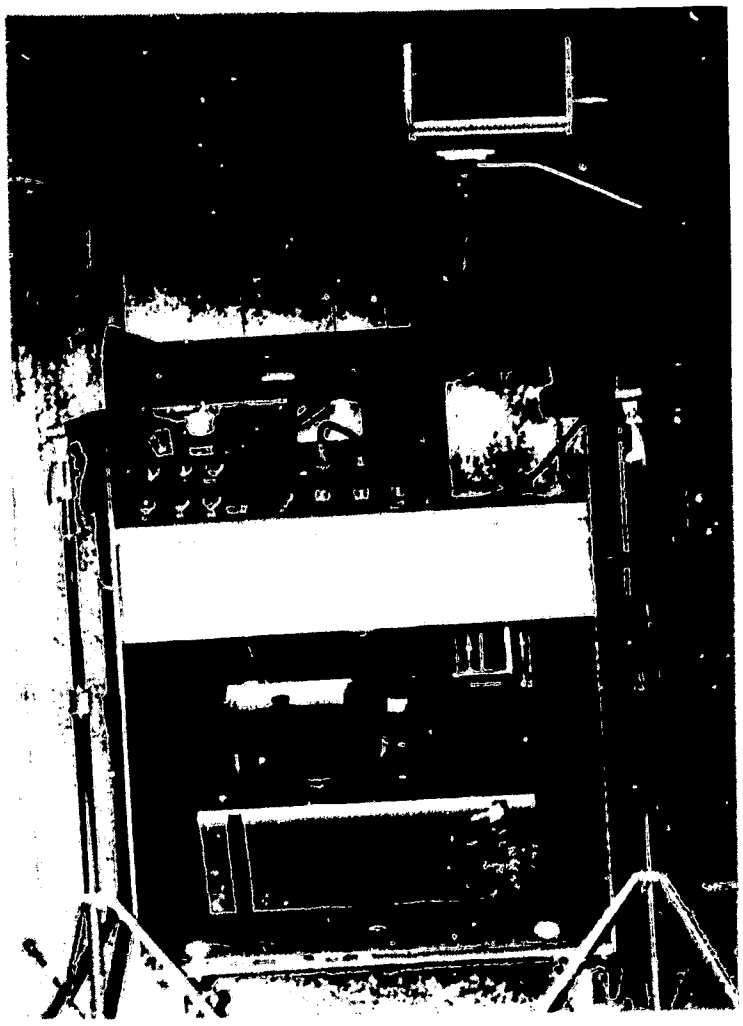
PLAYBACK MONITOR:

1. Setchell-Carlson 2100 (without receiver) ---------- $250.00
   (includes speaker-smplifier)

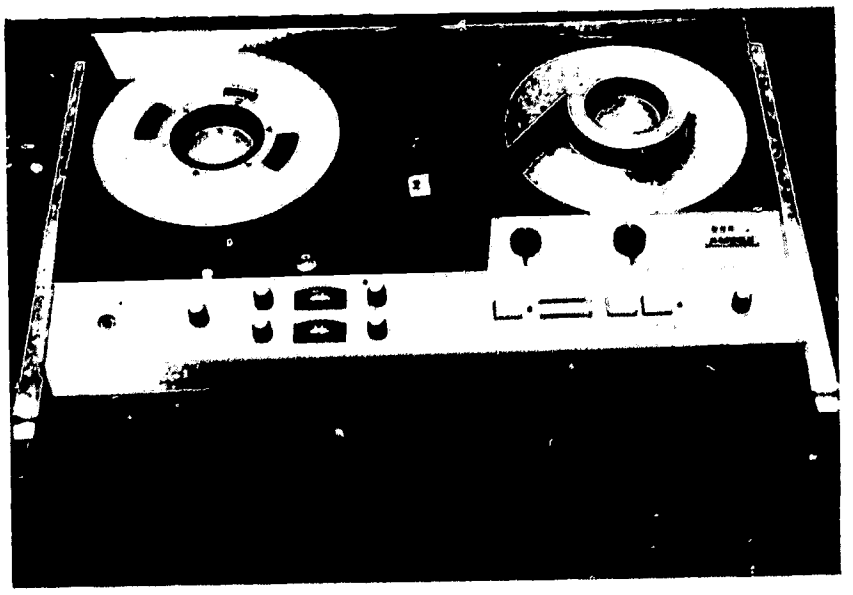
MONITOR CART:

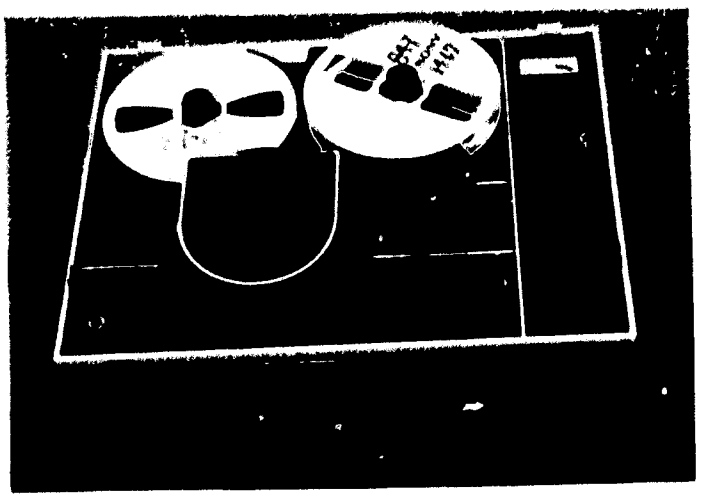
1. Pixmobile ---------- $65.00

THE BASIC SYSTEM

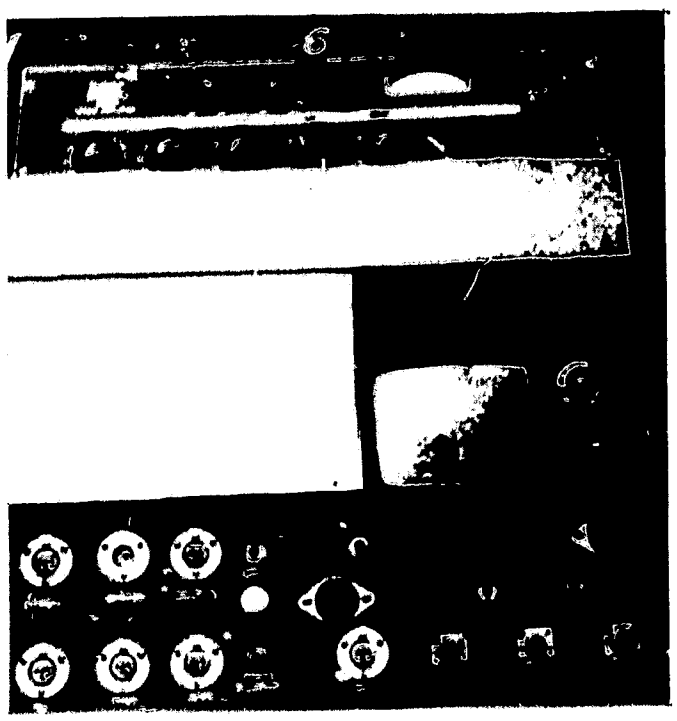


Pictured above is the complete Basic System, with the EV-200 recorder. Cart size and design is same as in the Deluxe System.

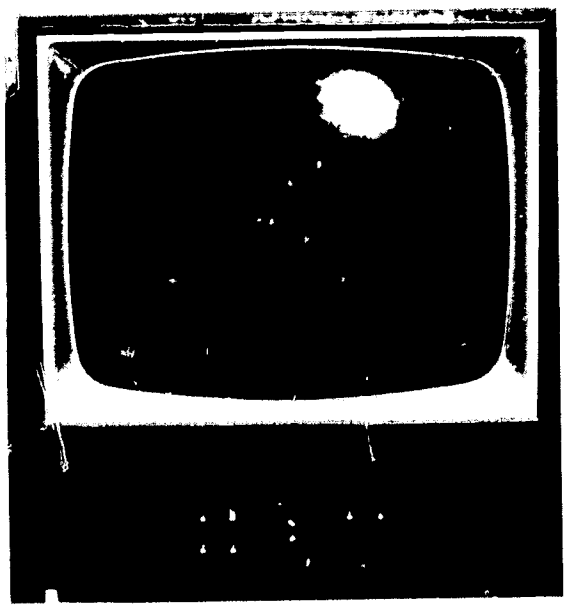




The two photos above show the two recorders used in the Stanford Basic System. (Top-Ampex bottom-Sony EV-200). The EV-200 is easily accommodated by the cart.



The photograph above shows the console of the Basic System. Room is provided for the addition of a compression amplifier and wireless receiver.



The monitor used for playbacks with the Basic System is the Sectchell-Carlson, above. Others in the same price range are available.

video tape: (see System A for tape costs)

TOTAL APPROXIMATE COST w/ Sony EV-200 ---------- $5290.00
and Concord camera w/GBC Zoom lens + tape

SYSTEM "C" (Low Cost)

The low cost system can be packaged in a number of ways:

1. In the "suitcases" that come with the major components
2. In collapseable carry ing cart (like a golf cart) which can be rolled into a station wagon.
3. In movable cabinets

RECORDER: Most of the low cost recorders can be purchased either separately or with camera, monitor, microphone, tripod, and lens.

1. Sony TCV2000 "Home recorder" only ---------- $730.00
2. Sony TCV2010 "Home recorder" with accessories ---------- $1295.00
3. Sony SV300 (Industrial version of TCV2000) Has standard industrial connectors, etc. ---------- $980.00
4. Accessories kit for SV300 ---------- $350.00
5. GE equivalent of the Sony SV300 (with kit) ---------- $1695.00
6. Others.

CAMERA:

1. That which comes with the various kits, or:
2. Shibaden HV13 (modified for external synch.)---------- $450.00

LENS:

1. GBC Conscimar 22.5 x 90mm Zoom ---------- $295.00

HEAD?MOUNT:

1. Tripod that comes with kit, or
2. Sampson Elevator (7301) and Head (7201) ---------- $115.00

CART MONITOR:

1. That which comes with the kit, or
2. Sony PVJ3030 without receiver ---------- $215.00

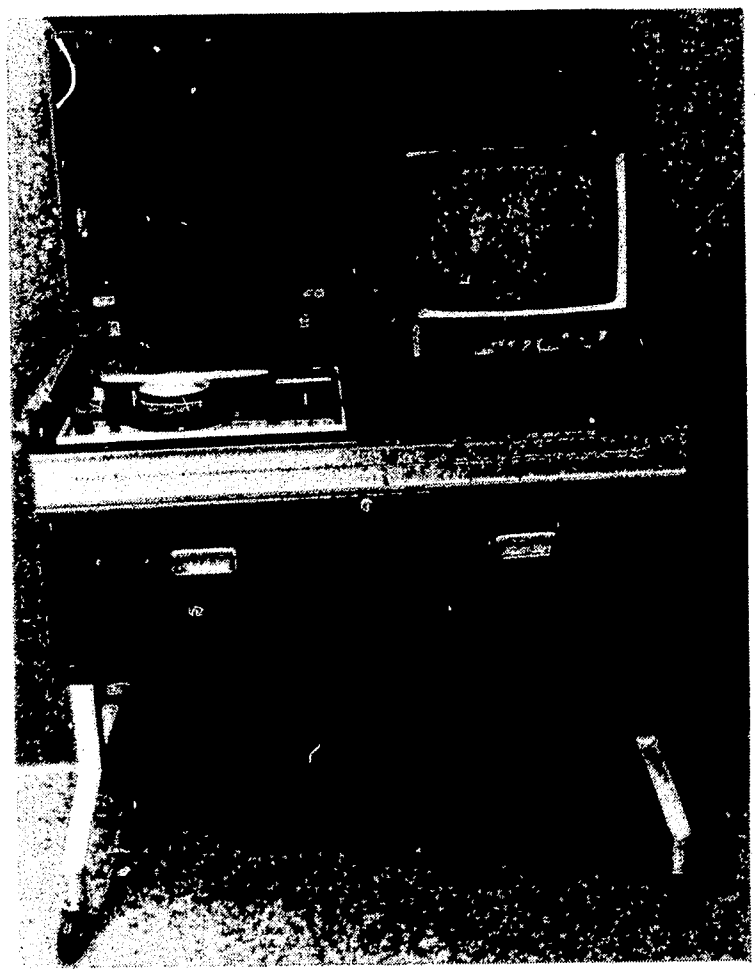
MICROPHONE:

1. That which comes with kit, or
2. Electrovoice Cardoid Dynamic #664 ---------- $60.00

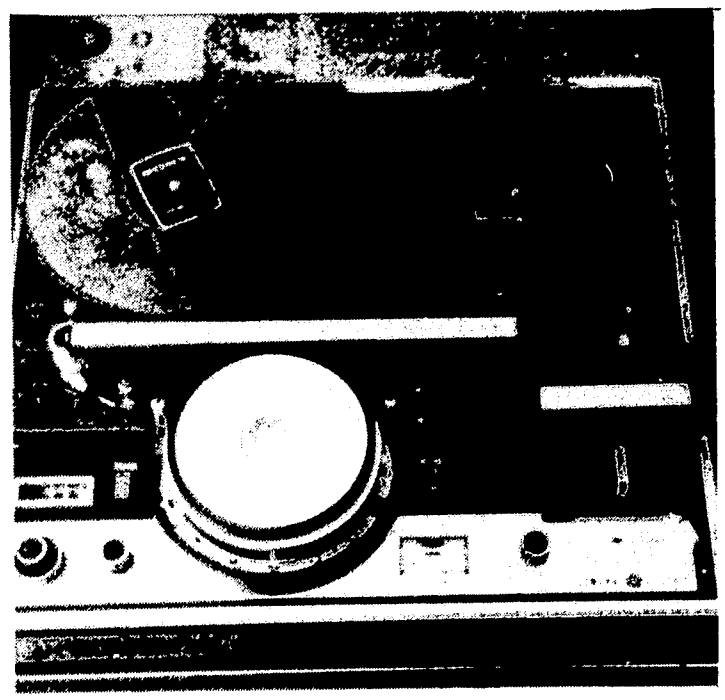
MIXER:

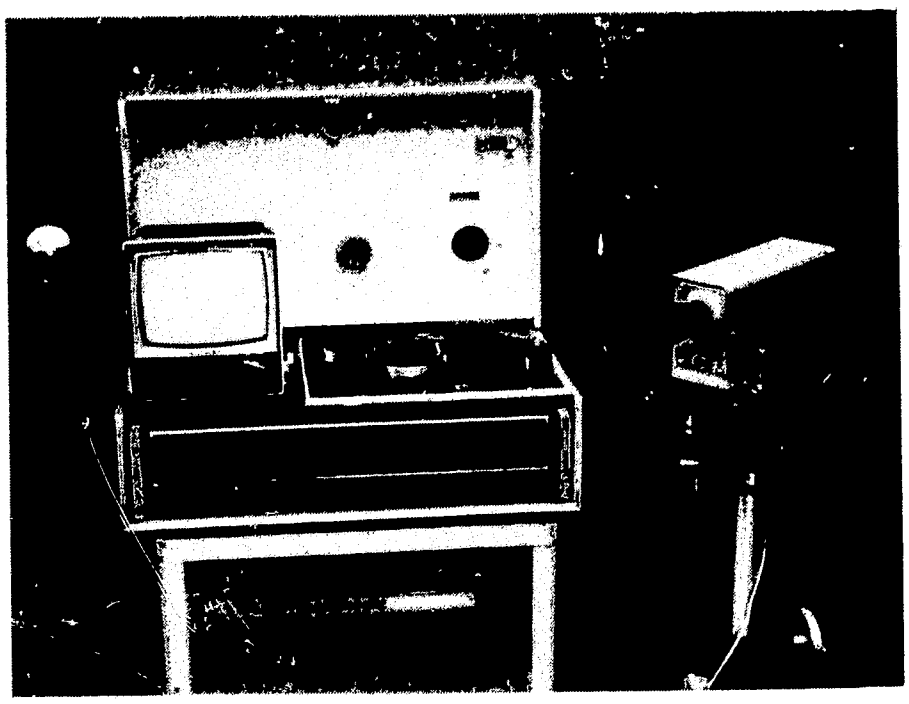
1. None if using only one microphone
2. Bogen 4 Channel MX 6A Mixer-preamplifier ---------- $40.00

THE LOW-PRICED SYSTEM



To the left and below are two examples of several low-priced commercialy sold video-tape recording systems. (GE and Sony) Such systems are low in price ($2-3,000.00), and are equipped with recorder, camera, microphone 9-12" monitor, and cables.





Pictured at the left is a close-up view of the tape deck included in the GE unit. The Sony deck is similar in looks and identical in operation. These recorders use ½" wide tape as compared to 1" on the other recorders pictured on preceding pages.

PLAYBACK MONITOR:

1. That which comes with kit, or
2. Setchell-Carlson 2100, without receiver ---------- $40.00

MONITOR CART:

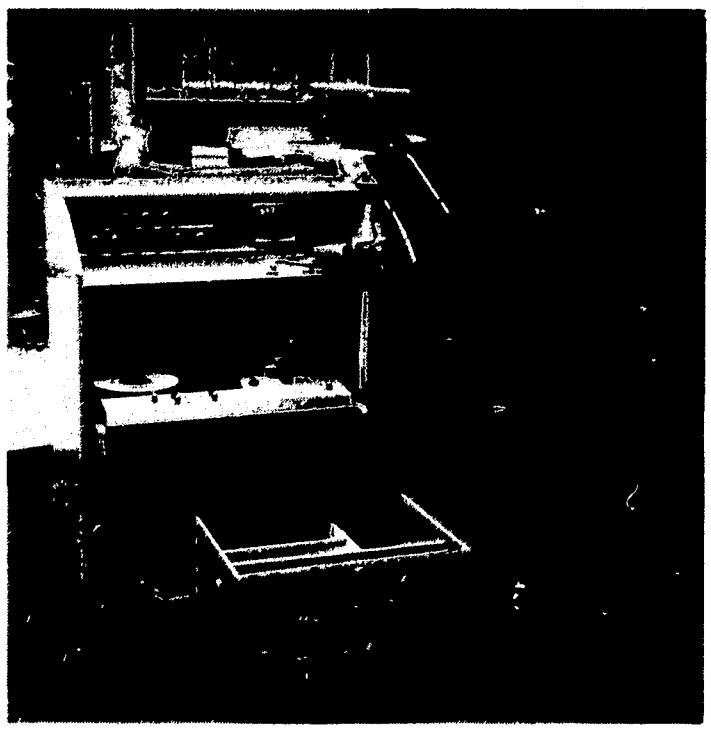
1. If needed, Pixmobile ---------- $65.00

VIDEO TAPE:

1. 2400" (60 min.)---------- $45.00

TOTAL APPROXIMATE COST, with the GE or Sony Kit + accessories + playback monitor and tape. $2,035.00

A PORTABLE VIDEO RECORDING UNIT



Specifications:			Approximate Cost
approx.	Dimensions:	Width 34" x Depth 22" x 46"	400.00
	Recorder:	Ampex 7000 or (Ampex 6000)	3,495.00
	Mixer Amplifier:	Altec 1567 A	300.00
	Monitor:	Sony PVJ 3030	195.00
	Camera:	Shiboden HV 13 or (Ampex)	450.00
	Zoom Lens:	Angenieus 150-15 mm.	800.00
	Elevator:	Samson Elevator 7301 - Head 7201	115.00
	Microphones:	2 Shure 5455 uni-directional each	55.00
	Microphone Stand:	Atlas C S 1	22.00
	Headphones:	Telex H F Y	8.00
		Total Cost w/7000	$5,840.00
		w/6000	3,840.00

other additions to be considered - Vega wireless receiver $550.00

Designed by David B. Young, for use at Hopkins Senior High School, Hopkins, Minnesota