

N90-24364**EXPERIMENT TITLE:** Demo of Three Ways To Use a Computer to Assist in Lab**AUTHOR:** J. P. Neville**AFFILIATION:** Wentworth Institute of Technology, Boston, Mass.**Key Words:**

- 1.) Enhancement of video presentations
- 2.) Remedial help and testing
- 3.) Information source and lab simulation

PREREQUISITE KNOWLEDGE REQUIRED: None**OBJECTIVE:**

Help the slow learner and students with a language problem, or challenge the advanced student.

EQUIPMENT and SUPPLIES:

Computer capable of generating movies

PROCEDURE:

1.) Technology has advanced to the point where images generated on a computer can easily be recorded on a VCR and used as a video tutorial. This transfer can be as simple as pointing a video camera at the screen and recording the image. For more clarity and professional results, a board may be inserted into a computer which will convert the signals directly to the TV standard. Using a computer program that generates movies one can animate various principles which would normally be impossible to show or would require time-lapse photography. For example, you might show the change in shape of grains as a piece of metal is cold worked and then show the recrystallization and grain growth as heat is applied. More imaginative titles and graphics are also possible using this technique.

2.) Remedial help may also be offered via computer to those who find a specific concept difficult. A printout of specific data, details of the theory or equipment set-up can be offered. Programs are now available that will help as well as test the student in specific areas so that a "Keller " type approach can be used with each student to insure each knows the subject before going on to the next topic.

3.) A computer can serve as an information source and contain the microstructures, physical data and availability of each material tested in the lab. With this source present "unknowns" can be evaluated and various tests simulated to create a simple or complex "case study" lab assignment.

REFERENCES:

- In-Office Video Taping: What will be Next?**, by Prof. John Lindenlaub of Purdue, Session 2630 of the 1987 ASEE Annual Conf., Proceedings Vol. 3 page 1337
- Multimedia Software Development for Electronics Technology Students** by Dr. Charles Schuler, Technical Education News (Spring 1989)
- Hypermedia** by Dawn Stover, Popular Science, May 1989

Equipment available in video stores in 1989:

Camera: There are many available - both from a tape size and feature point of view. There are also industrial versions as well as those designed for home use. Prices also run the full range with \$1000 being the tag on one that does almost everything.

Features needed:

The camera needed for making tutorials need not be capable of recording but it should have a zoom lens. If it can record, it may take the place of one of the VCR units shown in the diagram.

The camera will need to be capable of being operated at a distance. If it comes with a remote control it will be easier than having the shop rewire the unit. It should have an electrically operated Zoom as this is the major control that you will want to change during taping.

You can add simple titles with many cameras and this may be the least expensive way to superimpose them on your finished product.

Fade capability is a nice feature but may not see much use, depending on your style.

VCR: "Flying erase heads" are needed if a smooth transition is to be made from one scene to the next. This usually means you will need a machine with 4 heads.

The ability to change the speed of the picture is a good feature since you can play back at a different speed than recorded and use this new speed in your final edited tape. Increasing the speed of animation this way may help it run smoother. Pictures taken off a computer can also be enhanced this way.

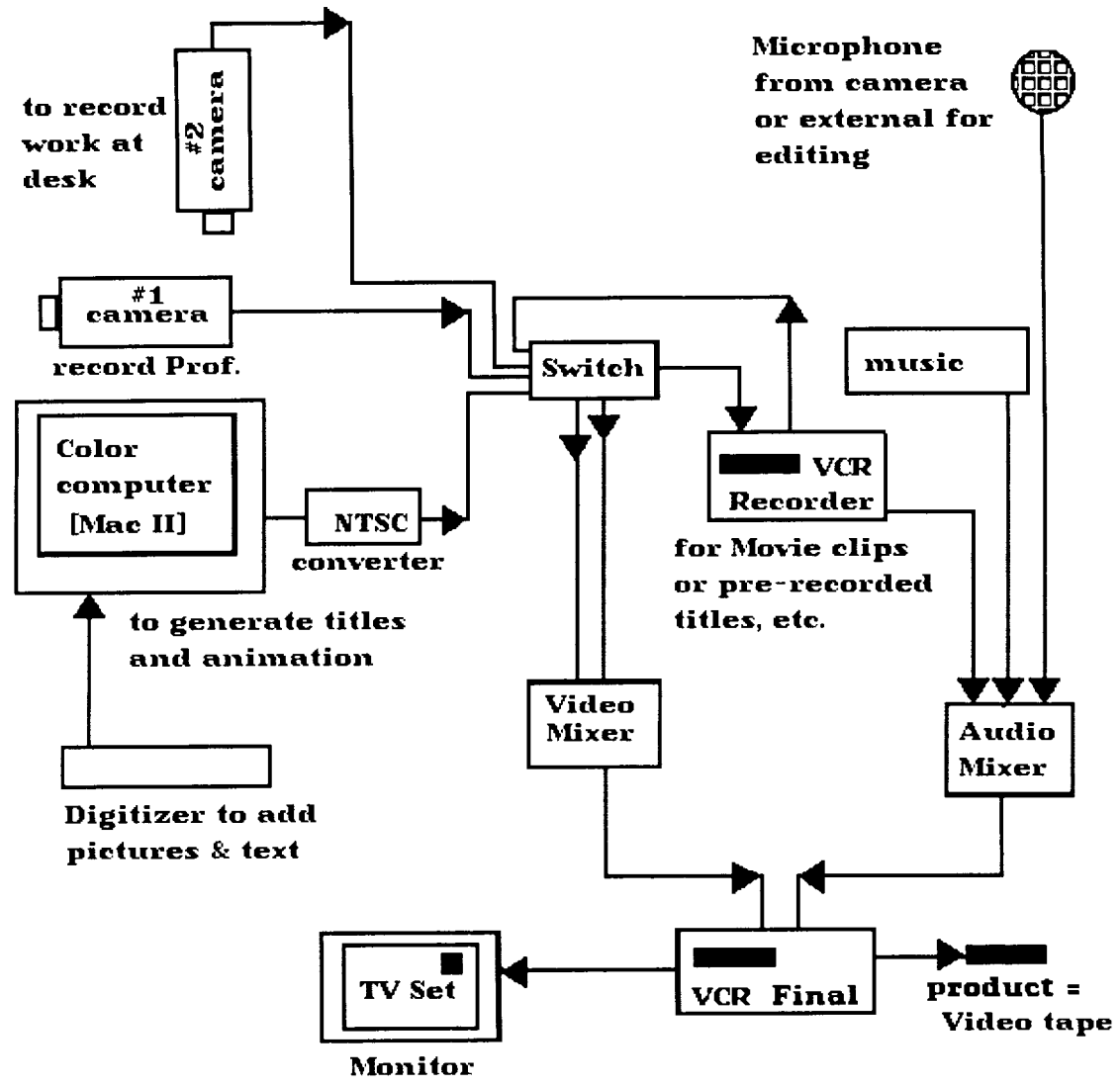
Editing Equipment:

Sound mixing: To add music or voice over your original tape and still keep the original sound track you will need a **Video Tape Audio Mixer**. Sima Products Corp. of Chicago is currently marketing a "SoundMixer" in department stores for around \$70.00. This unit is capable of mixing 3 inputs, changing the volume of each separately. This allows you to use PIP [picture-in-a-picture] and have the voice come from one source.

Picture-in-a-Picture: Rabbit Systems of Santa Monica, Ca. market a "Double Play" unit for \$250.00 which is designed to show two TV stations on your screen at once, [PIP]. It is a rather useless, overpriced unit as advertised but makes a great, inexpensive way to add yourself to a tutorial. Setting the unit to Ch. 3 one can mix a live camera and a tape and send the result to another VCR. This will create a "Talking Head" in any one of the four corners of the picture. The insert can be added or removed at any time and you can swap the small picture for the large at any time also. It is a nice way to add a personal touch to film clips or animation. It is also a way to show a problem and do it at the same time in a tutorial.

DirectEd is a unit available from Videonics of Campbell, CA. for around \$500 which generates titles in various colors and provides several different transition modes from one scene to the next. It also provides a few "graphics" you can add. Once you have marked your tape, the machine will automatically use your original to generate a new tape, removing parts or inserting the titles you desire in the proper places. It is much less expensive and less work than using a computer, but it provides no animation.

SET-UP USED TO MAKE VIDEO TUTORIALS



THREE STEPS OF THE PROCEDURE

