General Media Considerations

and Specific Applications for

the CASE Training Institute

by

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and

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TABLE OF CONTENTS

AN OVERVIEW OF COMMUNICATIONS MEDIA

In the present the post-industrial, early cybernetic American Society, new media are becoming increasingly important to communicate the new technology. Before the Civil War, communication was primarily face to face, written, or printed. Since then, the use of telegraphs, telephones, photographs, audio recorders, motion pictures, radios, and televisions has become widespread in the United States. The next few years promise even more, e.g., visual (sketch pad) communication between man and computer, xerography facsimile transmission between homes and offices and libraries, and true three-dimensional still and motion image storage and transmission. These new media have been applied in many situations for many reasons in schools and colleges; however, media alone have no specific educational value. They must be accompanied with meaningful application. Learning behaviors do vary in rates with different media. The medium is not the reinforcement, but only a tool to present information at varying rates and in different forms. Whether the student listens, takes notes, or sleeps depends on the consequences, not on the medium.

SOME ASPECTS OF MEDIA

With the invention of still and motion photography, and later, television, man gained powerful tools to record, store, and transmit information of a two, three, or four dimensional nature. The new media are now transmitting much of the content that the arts--painting, music, sculpture, literature, and theater--once communicated. Just as the early printed books were called "cheap imitations" of hand painted, gilded manuscripts, television, radio, and motion pictures are labeled a "vast wasteland" when

compared to opera, symphonies, and ballet. One thing we must realize when looking at these newer media is that they reach almost everyone. Television (even when considered purely as an entertainment medium) has created an understanding of two, three, and four dimensional concepts on a mass scale that was physically impossible through the theater, ballet and other older media. We cannot dismiss these new media because they are not rigidly formulated arts; in fact, we should accept this lack of rigidity as a challenging opportunity, allowing us to explore through research, and design new utilizations of these media.

If we ignore the judgments and labels that have been applied to the newer media we can start to discover what their limits and possibilities are. Can the medium communicate one dimensional (linear), two dimensional, or three dimensional concepts? Does it communicate the fourth dimension -- time? What is the quality of definition, the cost, and the time lag between production and presentation? Which sensory mechanism receives the medium, and how many people can receive the medium simultaneously? Answering these questions about the different media gives the knowledge needed to choose a medium suited to a particular subject. For example, art historians use color slides that are basically two dimensional to illustrate two dimensional paintings and drawings. Sculpture and architecture are also communicated with slides, but not as well because the quality of space, the third dimension, has to be communicated indirectly by perspective. The "history" in Art History refers to events placed in a time sequence. Slides also may be events in a time sequence. The idea of time and history may be communicated

with no trouble by ordering the slides in terms of dates. Slides, however,
do not retain two dimensional scale. Students, when visiting the museum,
often don't recognize a nine-inch square painting that they have seen in
class on a ten-foot screen. There is no practical way at present to
communicate scale or three dimensionality to large groups. So, slide
presentations are probably the optimum choice. Slide lectures might be a
good medium to communicate Art History, but all content-medium couplings
are not so logical.

The alphabet and later printing gave us a method of recording and
storing verbal information of a linear nature "through" time. Art, illus-
tration, and diagrams communicated a multitude of directions and relations
of an "instant". The photograph duplicated what painting had finally
achieved in capturing the "instant" so painters went on to explore multiple
and sequential views much as James Joyce had done with writing. The motion
picture took photographic images and added the new frequencies of sound to
achieve a view of a multitude of images in a sequential, temporal relation-
ship. Television has much lower definition or image quality than motion
pictures, but it adds immediacy and easy transmittion (at the speed of
light) to the qualities of motion that it shares with motion pictures.

Holography, the latest communication medium discovered, utilizes
coherent light (lasers) reflected from actual three dimensional solid
objects through a small cube of sensitized material that registers an image.
Thereafter, if a laser beam is again passed through the cube, the image
becomes visible in three dimensions. More amazing though is the fact that

as the cube is rotated, the image is seen from different sides or angles with constantly varying perspectives.

From this array of media, we can choose a medium to communicate any body of knowledge. If we want to communicate the idea that X varies inversely as a function of Y, for all real values of Y greater than zero, we could put it in a text with a diagram that shows all values at once, or a sequential series of graphs could be used in an animated film. As new coordinate pairs are added to the moving graph, the observer would not only see the finished curve that was generated, but also the process of the generation and the intermediate forms of the graph. To teach languages, tape recorders, records, or even a telephone would probably be chosen to use. For any particular body of knowledge, one medium or one array of media will be suited to communicating that knowledge.

When placed in a position of having to communicate, there are four major areas to consider. First, there must be a functional definition of what is to be communicated; second, who is to be the receiver, what is the repertoire and limitations of that receiver, and what consequences are operative on their reception. The basic spacial, temporal, and sensory relationships in the knowledge or content desired to be communicated is the third factor. The last factor is, what are the abilities of media and which will communicate the content best within a budget of available resources?

MEDIA CONSIDERATIONS FOR THE CASE TRAINING INSTITUTE

During the two weeks of the C.T.I. we utilized a variety of audio and visual media, motion pictures, lectures, chalkboard illustrations, charts, 1- and 2-screen slide programs, 3-screen slide and tape recorded programs, booklets, pamphlets, papers, 1-screen dissolve linked slide programs, laboratory demonstrations, and closed circuit television. Any of the material presented could have been presented in a number of these media. The staff chose the media through decisions based upon a knowledge of the capabilities of the different media and upon the physical resources available to us.

The information presented in this conference can be divided into the following types. Some of the information presented represents the "state of the art" as of January 1967. This was presented in lectures and slide programs that have the ability to grow and change with the ongoing research that forms their content. Another segment of information, especially films, are "off the shelf", general use presentations ordered from distributors. A third area includes materials produced originally for other purposes that have been edited for use in this conference based on the audience's reper- toires and needs. Live closed circuit television, demonstrations, and the knowledge the participants bring and demonstrate in questions and discussions are less controlled and represent a fourth type of information that is present.

Live lectures, chalkboard illustrations, and demonstrations that allow a high degree of feedback, were programmed to fit conditions of the moment, and edited with little trouble. Coupled with slide images, that can also be edited easily, they transmitted a majority of the institute information.

The 3-screen slide/tape programs are highly refined educational tools, as are motion pictures, but are superior in those cases where simplicity of production, editing, and budget are major factors. The motion picture has the capability of communication motion, time, and other media. The sophisticated technology that gives the motion picture these advantages also makes it a rigid medium, difficult to edit or bring up to date.

The CASE Training Institute had about eighty program hours. This was broken down into approximately nine hours of motion pictures, four hours of 3-screen slide tape programs, nine hours of slides and lecture, five hours of demonstration, and eight hours of closed circuit live television. This adds up to about 35 session hours -- or about one-half the total. In addition, about 40 papers, pamphlets, and booklets were handed out for reading in the evenings and for a permanent record that each participant could take home as reference material.

This media breakdown was decided upon after considering the participants' needs and repertoires, the spacial and temporal relations of the content, and finally, the abilities of the different media to communicate the content to the participants.

EQUIPMENT AND SPECIFIC TECHNIQUES

3-Screen Slide-Tape Programs

This system was developed at Southern Illinois University by Mr. Herb Meyer, Mr. Charles Daugherty, Mr. Harold L. Cohen, and Mr. James Filipczak for use in a General Studies Design Course, GSC-205. Ten programs were put together and the necessary equipment assembled. Three of these same programs in second, third, and fourth editions were among those presented at the CASE Training Institute.

The 3-screen programs are presented through both audio and visual stimuli. The audio portion is recorded and played back on a tape recorder. The visual portion is recorded with one or more 35mm cameras and color film. It is played back through three slide projectors on three screens. Using a high fidelity stereo tape recorder, the audio portion of a program can simulate closely any live, humanly receivable sound. The slide image has all the qualities of the actual object, except that it is not necessarily in the same scale, is not three dimensional, and does not have motion. A 3-screen program should be produced as a part of an overall educational ecology. Its role is just one part of any communications job.

There are six separate tasks in the physical production of a program, not counting the techniques of programming in the behavioral sense. First, the content must be decided upon and outlined. Next, pertinent slides are gathered and a script is written for the narration. The third step is to lay the slides out on a light box in relation to the script. The slides are layed out in three columns, corresponding to left, center, and right images. Blank cardboard squares are put in those positions where a screen

is to be dark. The fourth step is to put cues on the script above the word at which the projector should change, and to show which projectors change there. Cue change points are noted by drawing a small rectangle above the words in a triple spaced, typed script. A small caret (or arrow) is attached to the rectangle pointing to the exact spot. To indicate left, center, and/or right projector advance, a small dark mark is placed at the right end, center, or left end of the box. (See Illustration # 1.)

Once the script is written and the slides are cued to it, the slides can be put into trays (Step 5) and we can proceed to a ound and control tape which is Step 6. Using a good tape recorder and microphone, and the best available narrator, we record a master sound track. If music is desired -- it can be recorded at the same time, or can be added afterward by using two tape recorders.

When the master sound track is finished, it is a good idea to make a work copy of it on the right channel of another tape, storing the master away carefully to insure against the possibility of accidental erasure, loss, or breakage.

On the left channel of the work copy tape, the projector control signals are recorded. The synchronizer unit used at the CASE Training Institute (See Appendix A) consists of a black box with five pushbuttons labeled "Left", "Center", "Right", "All", and "Go". When this black box is plugged into the left channel of a tape recorder that is recording, a distinct tone will be recorded for any of the five buttons pushed. Using a recorder that can record "sound with sound", control signals are recorded on the left channel as the narration is heard on the right. The appropriate

ILLUSTRATION #1: AN EXAMPLE OF A 3-SCREEN

SCRIPT WITH PROJECTOR CONTROL CUES

Excerpt from Manscape:

-0/45-*"Out of the primordial violence and chaos of a blind universe, by

accident and by law, by explosion and gravitation, is born a new

11 SEC.

planet. . . . . a blob of gas. . . . . in the beginning

formless and featureless . . . . . . anarchic matter, to condense by

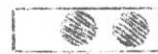some unknown destiny into "that most unweary bright cinder". . . *7 SEC.*
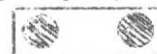
the earth . . . . Layer by layer, little by little, shaped

6 SEC.

by the relentless rhythm of fire and ice . . . . sun and rain. . . . . ."

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*Minutes and seconds from beginning of audio tape.

buttons are pushed (Left, Center, Right, or All) that have been cued
on the script, a few words in advance of the actual cue. When the
narrator reaches the exact word that is the cue for the change in the
script, the "go" button is pushed. After all the cues in the script are
recorded, the tape is played back. The right channel tape recorder output
is connected to a loud speaker, the left channel output to the input of
the synchronizer. The three projectors are turned on, the slide images
(in the trays) are placed on the appropriate projector, and the remote
control cords -- that have been modified by cutting off the pushbuttons
and replacing them with microphone plugs -- are connected between the
synchronizer and the projectors. (See Illustration # 2.) As the tape
is played, the music and narration will be heard while the synchronizer
discriminates between the five control sounds. The syncronizer stores
the signals -- Left, Center, Right, and All -- until the "go" signal is
received. This insures that all projectors advance at the same instant.

Images for slide programs are easily obtained from a variety of sources.
Commercial slides can be purchased from a variety of sources, most of which
carry a complete selection of travel slides, buildings, mountains, and art.
Some distributors also carry special series, such as "Animals of the World",
"The History of Industry", and "Antique Cars and Locomotives". Life,
Fortune, National Geographic, and other magazines carry a number of large,
quality, color images that can be copied with a 35mm camera equipped with
bellows, close-up lens, or extension tubes. Pictures as small as "8 x 10"
are indistinguishable from original photographs, 2" x 3" magazine pictures
often will provide fair quality images, but this depends on lens, camera,
film, and printing method quality. Records are available with sound effects,

ILLUSTRATION # 2 SCHEMATIC LAYOUT OF EQUIP-
MENT FOR THREE SCREEN SLIDE-TAPE PRESENTATIONS
(MIRRORS ARE NOT ILLUSTRATED FOR CLARITY)

3 PROJECTOR REMOTE CONTROL

REAR PROJECTION SCREEN

SCREEN SEPARATION BARS

"UMBILICAL"
CABLE

CAROUSEL PROJECTOR

CAROUSEL PROJECTOR

CAROUSEL PROJECTOR

CINE
PROJECTOR

JUNCTION
BOX

SLIDE-TAPE
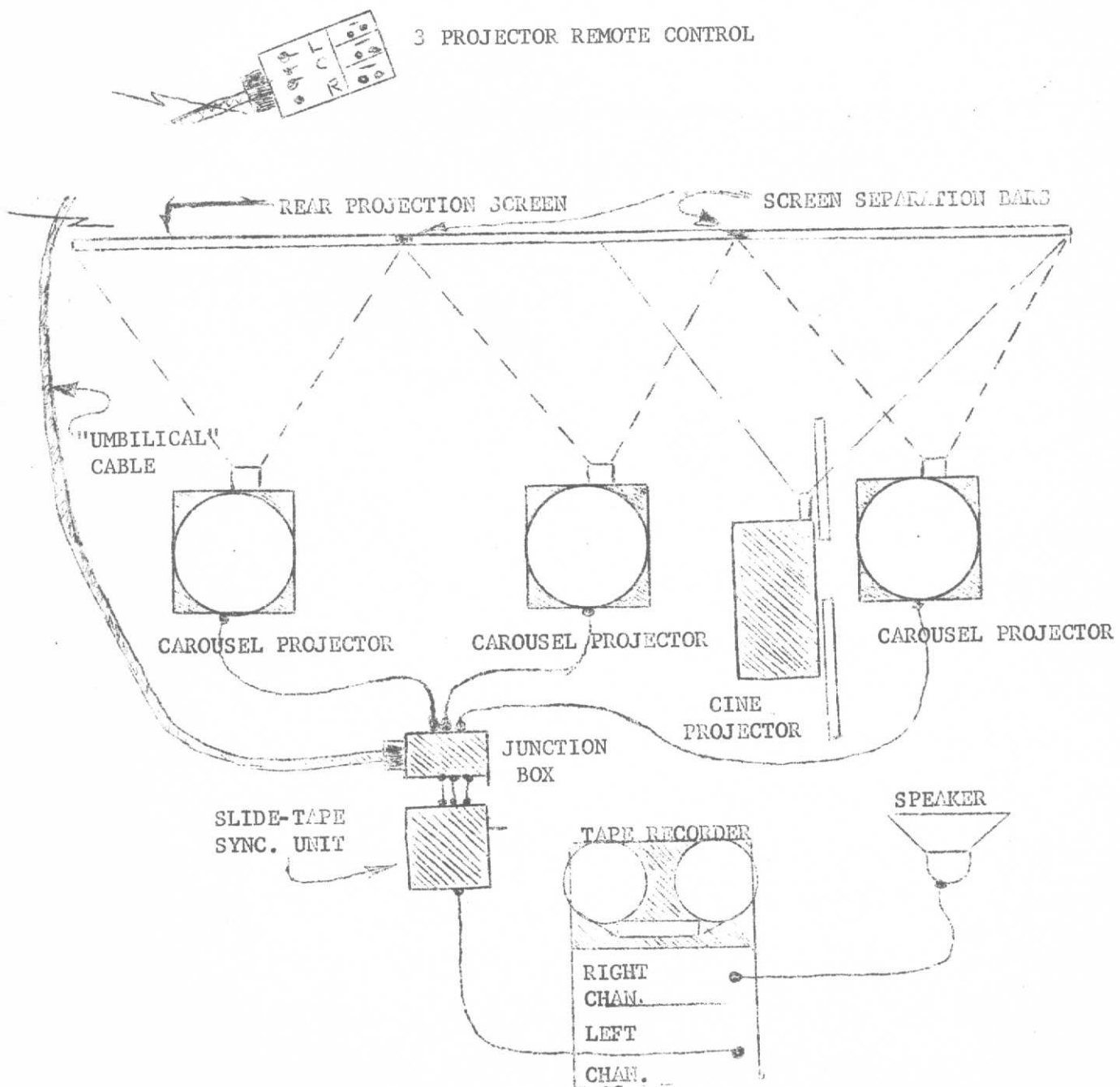SYNC. UNIT

SPEAKER

TAPE RECORDER

RIGHT
CHAN.

LEFT
CHAN.

ILLUSTRATION # 3 WIRING SCHEMATIC FOR JUNCTION BOX AND THREE PROJECTOR REMOTE CONTROL

In the following diagram B, R, Y, and W represent the color of wires, as they are found in existing Kodak Carousel projector remote control cords. Plug P1 should be connected to jack J 1, P2 to J 2, and so on through P 8 to J 8. P 9, P 10, and P 11 are plugged into the remote control jacks on the carousel projectors, and plugs P 12, P13, and P 14 are plugged into the syncronizer.
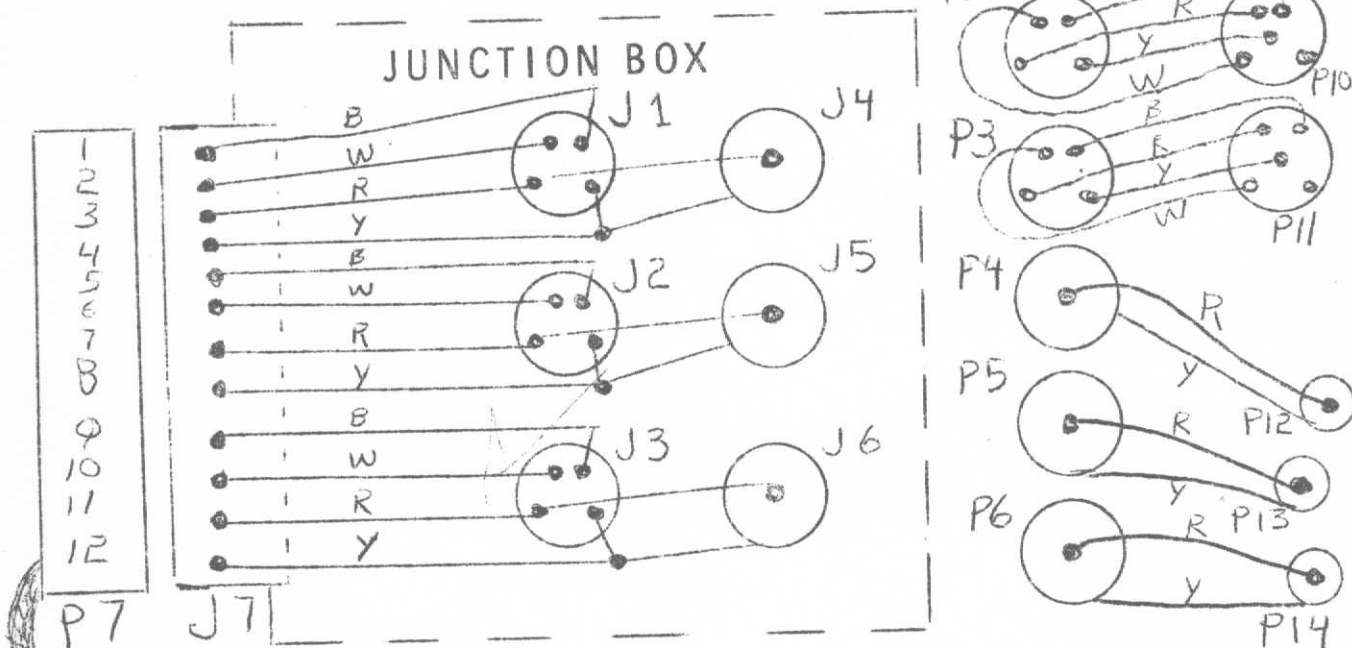
12 conductor cable between plugs P 7 and P 8.

Switch S 4 "GO" will operate projectors only if switches S1 "LEFT", S 3 "RIGHT", or S 2 "CENTER" are already closed.

SP MOMENTARY CONTACT
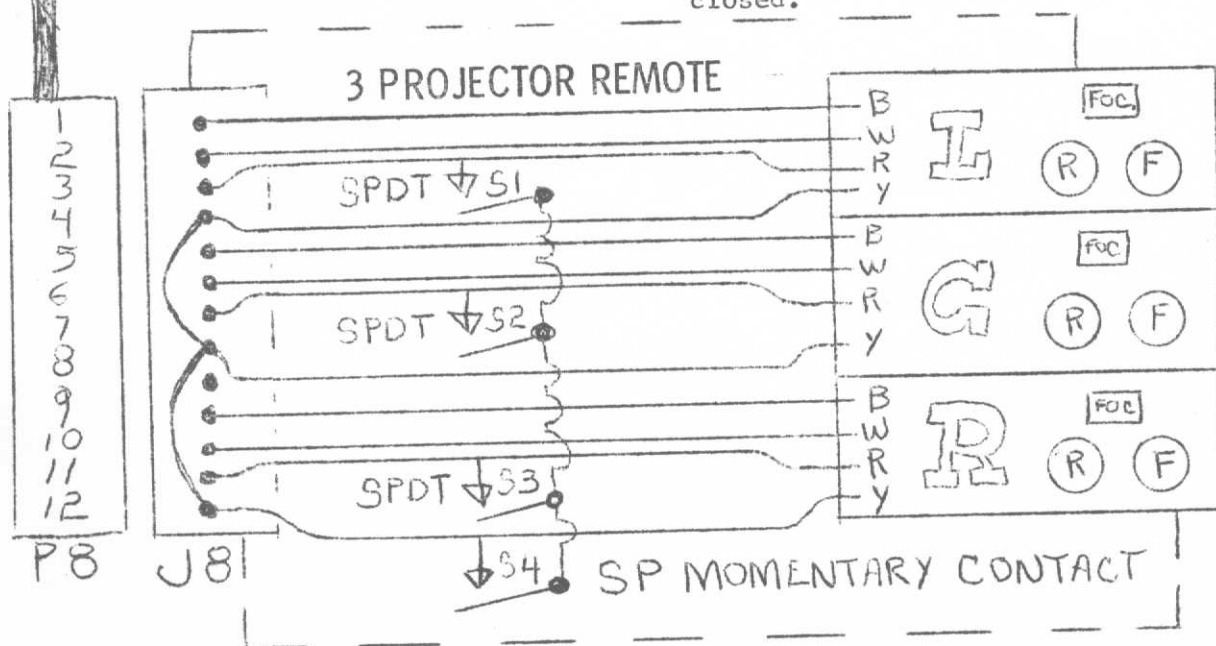
If there had been higher ceiling heights in the C.T.I. auditorium so that projection could have been accomplished over the audience's head and had there been enough space available for a projection booth, the same goals could have been accomplished with front projection.

Mirrors were used (See Illustrations 4 and 5) for two reasons. First, they reverse the image and since rear screen projection was chosen - which also reverses the image - slides set up for front projection didn't have to be reversed in the trays. The second reason mirrors were used was to shorten projection distances by folding the image beams. Following a few simple procedures mirrors were easily aligned:

1. The axis of the projected beam must be perpendicular to the screen to eliminate keystoning.

2. If a scale drawing is made of the projected beam, the result is a triangle, the base being the width of the screen and the height the projection distance (See Illustration 5). If this drawing is cut out it can be folded and placed on a drawing of the projection booth to give us the placement of the projector, screen, and mirror.

Motion pictures were projected off three mirrors in order to get a large image. One of the separator posts in the screen was movable to allow for the larger image. Because motion picture film cannot be reversed in the projector - as slides can - it must have at least one mirror for rear screen projection to insure the image appears with the right orientation.

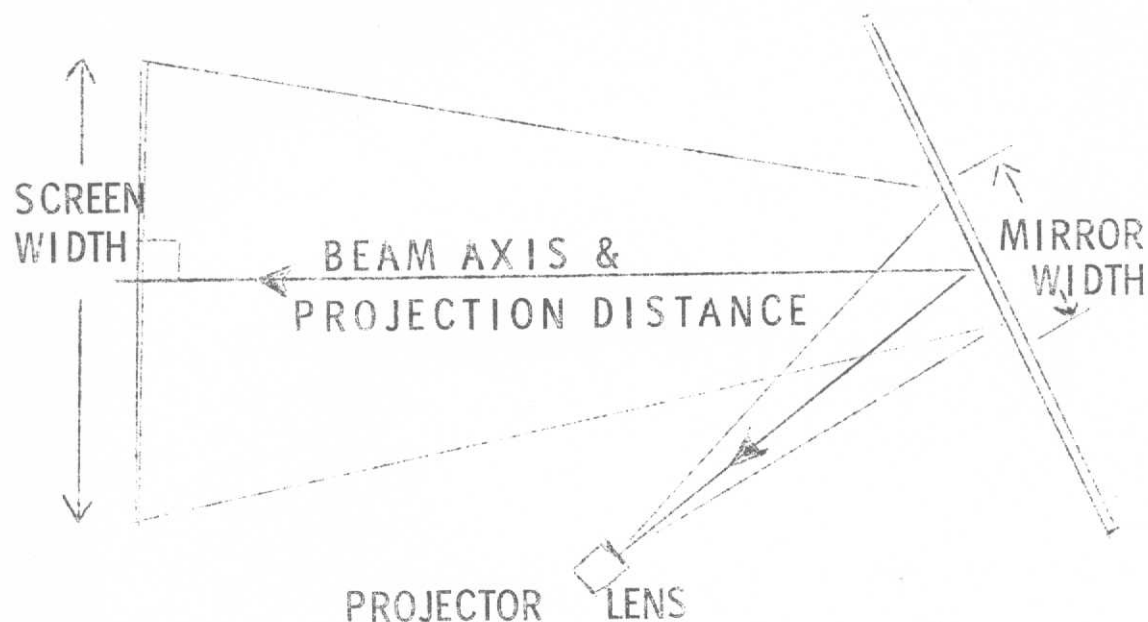# ILLUSTRATION # 4   CALCULATION OF EQUIPMENT PLACEMENT IN FOLDED BEAM PROJECTION

SCREEN WIDTH

BEAM AXIS & PROJECTION DISTANCE

MIRROR WIDTH

PROJECTOR   LENS

ILLUSTRATION #5 PROJECTION DISTANCE CHART

IMAGE WIDTH	LENS FOCAL LENGTH								4 TO 6 zoom		
	1.4	2	3	4	5	7	9	11	4	-	6
20 inches	2½	3	5	7		12	15	18	7	-	10
30"	3½	5	7	10	12	17	22	27	10	-	15
40"	5	6	10	13	17	23	30	36	14	-	20
50"	6	8	12	16	20	29	37	45	17	-	25
5 feet	8	10	15	20	24	34	44	54	20	-	30
6'	9	12	18	23	29	37	52	64	23	-	35
8'	12	16	23	31	39	54	70	85	31	-	46
10'	14	19	29	39	48	68	87	106	39	-	58

PROJECTION DISTANCE IN FEET

Summary

Every medium of communications has its own individual properties and capabilities. The medium does not control or maintain learning behavior, but it is a factor in determining the rate or limits of learning, when incorporated into a planned ecology of education.

During the CASE Training Institute, a variety of media were used. Their use was determined through logical methods based on a knowledge of the abilities of the media, the physical and existing resources, and the content to be communicated.

A combination of commercial and special motion pictures, slides, tapes, books, pamphlets, and charts were used in combination with lectures and discussions. Special facilities were designed and built to insure every participant had an optimum view of lecturers, screens, charts, and chalkboards, and clear reception of voices and recordings, free of disturbing sights and noises.

APPENDIX A:

Projection Equipment

No.	Manufacturer--Equipment	Approx. Price
2	Kodak AV--900 Carousels 3" lens	$200.00
2	Kodak AV--800 Carousels 4"-6" zoom lens	200.00
1	Roberts 770x Crossfield Tape Recorder	320.00
1	Kodak AV--256TR 16mm Cine Projector	380.00
1	Hudson Photographic Industries Dissolve Slide Control	150.00
1	Communications Collaborative, S.I.U., Carbondale, Illinois, 3 Projector--Tape Synchronizer	100.00
1	Polacoat 27' square Rear Screen	80.00
2	Jensen 8" Loudspeakers @$50 each	100.00
3	18"square Mirrors (first surface)	50.00
1	42"x30" Mirror	35.00
1	9"x18" Mirror (first surface)	5.00
		$1620.00

Copying Equipment

No.	Manufacturer--Equipment	Approx. Price
1	Honeywell Pentax H3V with 55mm Takumar f 1.9 lens	$175.00
1	Honeywell Pentax cadmium sulfide coupled Light Meter	50.00
1(set)	Extension tubes	15.00
1	Sheet 4'x 6'x 1/8" frosted Plexiglas for light table	35.00
3	3200 K 500 watt Bulbs	5.00
3	Patio Light Fixtures	5.00
		$385.00

APPENDIX B:

Programs and Materials   (cont'd)

CASE II MODEL, Produced by Granada Films for the BBC. Copy shown owned by the Institute for Behavioral Research, Silver Spring, Md.

CASE II MODEL, Filmed by WTOP-TV, Washington, D.C., edited by C.T.I. Staff, owned by I.B.R., Silver Spring, Md.

FOR FURTHER INFORMATION:

General:

McLuhan, Marshall, Understanding Media: The Extensions of Man, McGraw-Hill Paperbacks, New York, N.Y., 1964.

Hughes, J.L., Programed Instruction for Schools and Industry, Science Research Associates, Inc., Chicago, 1962.

Fuller, R.B., and McHale, J., World Resources Inventory, World Design Science Decade, Documents 1-4, S.I.U. Press, Carbondale, Ill., L964-66.

Rear Screen Projection:

The Polacoat Lenscreen Bulletin #L557 , The Polacoat Corp., Blue Ash, Ohio, 1966.

Lap Dissolve Projection:

H.P.I. Control-A-Show, Hudson Photographic Industries, Irvington-on-Hudson, New York, 10533.

Cameras and Copy Equipment:

Carousel Notes: A Newsletter for Professionals, Eastman Kodak Co., Motion Picture and Educational Markets division, Rochester, N.Y.

Audio-Visual Notes form Kodak, Eastman Kodak Co., Motion Picture and Educational Markets division, Rochester, N.Y.

Popular Photography, Modern Camera, and other general newsstand magazines

Other Subjects:

Eastman Kodak Company Pamphlets, Motion Picture and Educational Markets Division., Rochester, N.Y., 1964-66.

#83   Audio-Visual Projection
#S4   Legibility Standards for Projected Materials
#S12 Artwork Size Standards for Projected Visuals
#S13 Planning and Producing Visual Aids
#S22 Effective Lecture Slides
#S28 Wide Screen and Mutiple Screen Showmanship
#S41 Projection Distances in feet for Kodak Carousel Projectors

(These are anly a few of the hundreds of Kodak pamphlets).