

A DESCRIPTION OF THE TECHNICAL ASPECTS OF  
MISSOURI VANGUARD THEATRE

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ABSTRACT

Missouri Vanguard Theatre is a small professional touring company with its base at the University of Missouri-Kansas City. This touring company performs primarily in the rural areas of the State of Missouri before audiences of all ages. The philosophy of performing for people of all ages has become the ambition of Missouri Vanguard, and the programs presented by Vanguard are expanding each year to encompass this philosophy.

Many of the touring restrictions and limitations placed upon the technical operations of Missouri Vanguard are complex and inter-related. But one of the primary restricting factors to the operation of Vanguard is imposed by the allotted budget, which limits the number of actors and technicians hired, the number of vehicles rented, the type of scenery and lighting used, and most importantly, the scenic style of productions presented.

Missouri Vanguard performs in very few buildings equipped with adequate theatre producing facilities; consequently, many existing physical conditions in the theatre plants often place limitations and restrictions upon the manner of technical operation and execution. For example, the location of the unloading area, the height of the



stage ceiling, the arrangement of audience seating, and the accessibility of the electric power sources are but a few of these restricting factors.

The Vanguard technicians are obligated to operate within the limitations imposed by such things as the budget, pre-tour deadlines, truck capacities, theatre plants, and the ritual of daily tour schedules, and still construct scenery and purchase equipment that is rugged, durable and of high scenic quality.

In 1968, the first year of the Vanguard tour, many technical failings resulted from the technicians' lack of experience with touring. After the first tour, with the limited experience gained, the technicians progressed to the use of better and faster means of executing their technical work. The modified method of scenery construction for two-dimensional scenery has now become standardized, and an inventory of durable, stock flats has been increasing each year. Three-dimensional scenery and set properties are being constructed so that they break down into smaller units for both storage and handling. Both ornamental elements of scenery and dress properties have been a problem in the past, and they will probably continue to remain so simply because they are delicate necessities which often are unique to a particular production and present special problems of construction and handling.

Vanguard has progressed from renting to owning lighting equipment. In the process of acquiring lighting equipment to tour, some selections have proven to be better than others. The most extensive

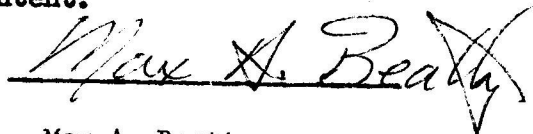
improvements have been made in the lighting for the out-front positions and in the portable, legged onstage light batten.

After five years of successful touring, improvements in Vanguard's technical program are still being made. Past experiences of the seasoned technicians and new ideas of younger technicians are invaluable to the technical growth of Vanguard.

Missouri Vanguard Theatre has played to well over one hundred thousand people in its five years of existence. A total of forty-two productions and classroom programs has afforded the people in the rural areas of Missouri the opportunity to experience live theatre.

This abstract of about 500 words is approved as to form and content.

Signed

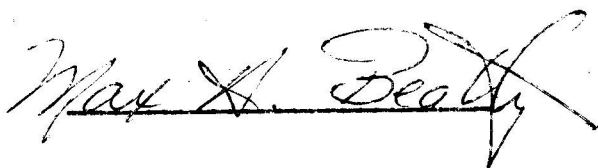


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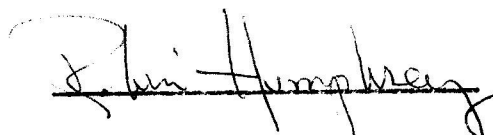
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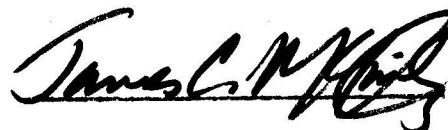
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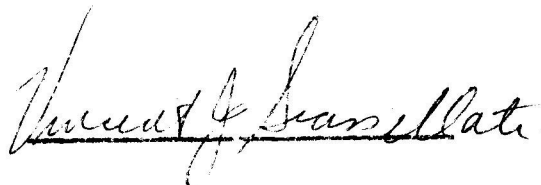
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## TABLE OF CONTENTS

LIST OF FIGURES . . . . .	viii
INTRODUCTION . . . . .	1
Chapter	
I.    BUDGET AND TECHNICAL PRODUCTION . . . . .	5
Technicians . . . . .	5
Crews . . . . .	5
Scenery and Equipment . . . . .	9
II.   THEATRE FACILITIES AND TECHNICAL PRODUCTION . . . . .	11
Access to the Stage . . . . .	11
Stage Ceiling Height . . . . .	14
Stage Width . . . . .	14
Stage Depth . . . . .	15
Stage Floors . . . . .	16
Sightlines . . . . .	16
Dressing Rooms . . . . .	21
Technical Questionnaire . . . . .	21
III.  TWO-DIMENSIONAL SCENERY . . . . .	29
Flat Construction . . . . .	29
Flat Covering . . . . .	34
Flat Painting . . . . .	35
Flat Hardware . . . . .	37
Flat Stiffening and Bracing . . . . .	39
IV.   THREE-DIMENSIONAL SCENERY . . . . .	43
Step Units . . . . .	43
Platforms . . . . .	44
Door and Window Units . . . . .	45
Ramp . . . . .	48
Puppet Theatres . . . . .	50
Ornamental Units . . . . .	51
V.    PROPERTIES AND TECHNICAL PRODUCTION . . . . .	52
Set Properties . . . . .	52
Hand Properties . . . . .	54

VI.	LIGHTING AND TECHNICAL PRODUCTION . . . . .	55
	Power Source . . . . .	55
	Out-Front Beam Lighting . . . . .	57
	Hanging Light Batten . . . . .	62
	Portable, Legged First Light Batten . . . . .	63
	Dimming Equipment . . . . .	69
	Lighting Instruments . . . . .	71
	Back Lighting . . . . .	74
	Cable . . . . .	77
VII.	SOUND EQUIPMENT AND TECHNICAL PRODUCTION . . . . .	80
	Equipment . . . . .	80
	Storage . . . . .	80
VIII.	PORTAGE AND TECHNICAL PRODUCTION . . . . .	82
	Truck Size . . . . .	82
	Loading . . . . .	82
	Scenery and Equipment Storage . . . . .	83
	Loading Ramp . . . . .	85
	Truck Lights . . . . .	88
IX.	TIME ALLOCATION AND TECHNICAL PRODUCTION . . . . .	89
	Design . . . . .	89
	Construction . . . . .	90
	Set-Up . . . . .	91
	Strike . . . . .	93
X.	SUGGESTED IMPROVEMENTS IN TECHNICAL PRODUCTION . . . . .	95
	Masking . . . . .	95
	Lighting . . . . .	98
	Additional Technician . . . . .	100
	Trucks . . . . .	100
APPENDIX A.	THUMBNAIL SKETCH OF AN AVERAGE TECHNICAL DAY . . . . .	102
APPENDIX B.	AUTHOR'S NOTES . . . . .	107
PLATES	. . . . .	110
SELECTED BIBLIOGRAPHY	. . . . .	117
VITA	. . . . .	118

## LIST OF FIGURES

Figure		Page
1.	Handout Floor Plan . . . . .	7
2.	Handout Light Plot . . . . .	8
3.	Corner Block Construction . . . . .	32
4.	Keystone Construction . . . . .	33
5.	Fabricated Hardware . . . . .	38
6.	Double Pivot for Saddle Irons . . . . .	40
7.	Platform Cams and Legs . . . . .	46
8.	Platform Cams and Legs . . . . .	47
9.	Angle Iron Door Frame Brace . . . . .	49
10.	Light Tree . . . . .	61
11.	Original Legged First Batten . . . . .	66
12.	Aluminum Truss . . . . .	67
13.	Legged First Batten . . . . .	68
14.	Mounting Bracket for Steberlite . . . . .	75
15.	Steberlite with Adaptations . . . . .	76
16.	Truck Support Pipe Rack . . . . .	86
17.	Free-Standing Masking Metal Work . . . . .	97

## INTRODUCTION

Missouri Vanguard Theatre is the name of a small professional touring company which has its touring base at the University of Missouri-Kansas City, and it is co-sponsored by the Division for Continuing Education and Extension of the University of Missouri-Kansas City, the Missouri State Council on the Arts, the National Endowment on the Arts and the local sponsoring community.

Missouri Vanguard Theatre was founded in 1968. One of the original concepts of this theatre was to offer longer periods of employment than had previously been available for local professional actors and technicians. The company has toured from 1968 to 1971, and the 1972 tour is now in progress. Once Missouri Vanguard Theatre had become a reality, the original concept was fulfilled, and since that time, another concept has become the primary goal of this company: to give people of all ages, throughout the State of Missouri, an opportunity to experience professional theatre. Through this experience, it is hoped that Missourians will be both entertained and educated.

Missouri Vanguard Theatre is not just a pared-down version of national touring companies, but falls into a realm of touring theatre distinctly different from the larger touring companies because it tours principally in rural areas and because of its philosophy.

While Vanguard's philosophy is that of presenting theatre to groups of all ages, its main focus is on the evening program which is a full-length production of a dramatic work. In addition to the evening performance, Vanguard presents a number of school programs. The actual number of school programs offered varies each year. There is an assembly program which is either a one-act play or a readers'/chamber theatre program. The remainder of the repertoire consists of a puppet theatre production for elementary grades and several high school classroom programs which are most often presented to English, History or Drama classes. Programs for junior high schools are being considered, but at present, because of the dearth of adequate entertaining/educational material for this age group, such programs are not offered.

The Missouri Vanguard tour takes place in the spring, with rehearsals beginning in January and lasting for approximately six weeks prior to the eight-week tour of the State. At the conclusion of the 1972 tour, Vanguard actors and technicians will have performed in sixty-one communities, at nearly one hundred thirty different buildings, for well over one hundred thousand Missourians and traveled over twenty thousand miles in their rented vehicles -- one truck and two station wagons.

A normal touring week for Vanguard consists of one dark day, two travel days, and four performance days. Since the majority of the bookings are one-night stands, the administration has arranged the tour so that the travel distance to the community to be played the following day is usually thirty miles or less. The best formula



found yet is to play two days in succession, then either travel or have a dark day. A normal working day for technicians starts at 7:00 a.m. and ends about 11:00 p.m., depending upon the distance to travel in the morning and the curtain time in the evening. (See Appendix A for a brief sketch of a normal technical day.)

For the last three seasons (1970-1972), Missouri Vanguard has spent one week in the Kansas City area performing at different high schools and junior high schools. Usually, Vanguard performs in two different schools each day, and the performance is at no expense to the school. The extra week has been underwritten by the University Associates. Though this week is possibly the most rigorous week of the whole tour, it has been a welcome addition to the actors and the technicians.

The physical size of Missouri Vanguard is small by comparison with a large touring company: eight actors, one stage manager, two assistant stage manager-actors, and two technicians. These are the full-time members of the company, but prior to the tour there are a few more members of the company: directors, scene designers, costume designer/costumer, and properties "gofer." There are also eight more members of the Vanguard company, but they change from day to day. It would be impossible for Vanguard to tour without these eight members. Each community supplies eight student or adult helpers to assist the Vanguard technicians in set-up and strike. Beyond these two functions, the eight crew members perform many other invaluable services for the company.

The aim of this thesis is to discuss conditions of the technical operation of Missouri Vanguard Theatre since its inception in 1968 through its present tour in 1972. This five-year span is looked at generally as it relates to the practices and methods, to the trials and errors and to the problems and solutions of the Vanguard operation.

Two distinct facets of the technical execution of Vanguard are discussed. First, the technical methods and limitations of preparing for the tour are presented; and second, the technical operation and the problems encountered during the road tour throughout Missouri are related. A number of descriptions will be given, stating how the Vanguard technicians have adapted to some of the imposed limiting factors encountered.

## CHAPTER I

### BUDGET AND TECHNICAL PRODUCTION

#### Technicians

Missouri Vanguard Theatre would never have come into existence without financial support, and it is this financing and the administration of the finances that are the major factors in the total picture of Missouri Vanguard. The budget for the technical aspects of Vanguard has had, and will continue to have, as much effect on the total technical look of Vanguard as any other item, condition, limitation or person.

The first year of Vanguard (1968), only one technician was hired. The minimal staff proved to be inadequate even prior to the tour when attempting to complete the scenery and have the other equipment in readiness for the local production at the Nelson Art Gallery. Another technician was finally hired two weeks prior to the opening. He was a valuable asset then, and an absolute necessity once the tour began. The budget, at present, restricts the number of full-time technicians to only two, and on occasion the technicians have had a difficult time getting an adequate technical picture on stage.

#### Crews

Up to the present, these two technicians have been able to complete their work in time for each performance, but they probably

never would have been ready without the assistance of the eight student crew members in each community. Fortunately, the eight crew members are supplied by the local communities and are not provided for in the Vanguard budget. These crew members fill the same basic jobs as members of the stage hands union do for the large touring companies, except that they do not operate either the sound or lighting equipment. (See Appendix B, #1.) They help unload the truck and set up the scenery and lighting, and occasionally, the sound equipment. All scenery is labeled precisely with flat numbers and stiffener numbers matching the flats, and hinge numbers indicating the exact mounting positions. Jack braces are numbered indicating either the flat to which they are to fasten or the door frame they are to support. Each door unit is numbered according to its position on stage. Upon the technicians' arrival, a sample floor plan is handed to the crew chief in each community, and after a short explanation, the students begin putting the set together. (See Figure #1 for a sample handout floor plan.) All cable is labeled precisely. Lighting positions are indicated with numbers for their hanging positions, and the backing lights are treated in the same manner. The students hang the instruments, connect and run the cables to the dimmer boards, and on occasion, are allowed to connect the cables to the dimmer board. No student is allowed to connect the main power. A precisely labeled lighting plot is also handed to the student crew chief. (See Figure #2 for a sample handout lighting plot.)

Almost all of the student crew help working with Vanguard on tour are not oriented to the theatre. The main reason for handing

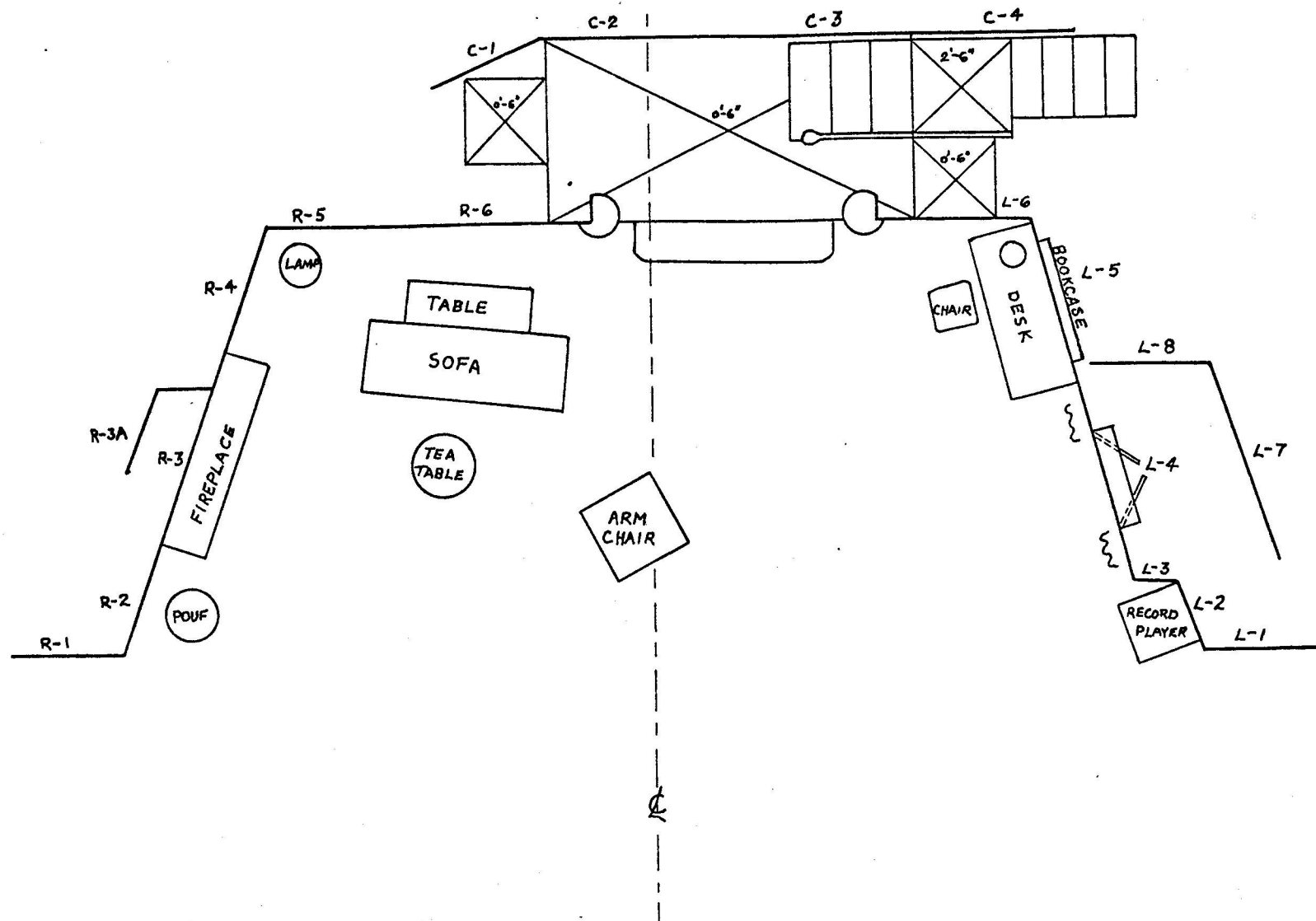
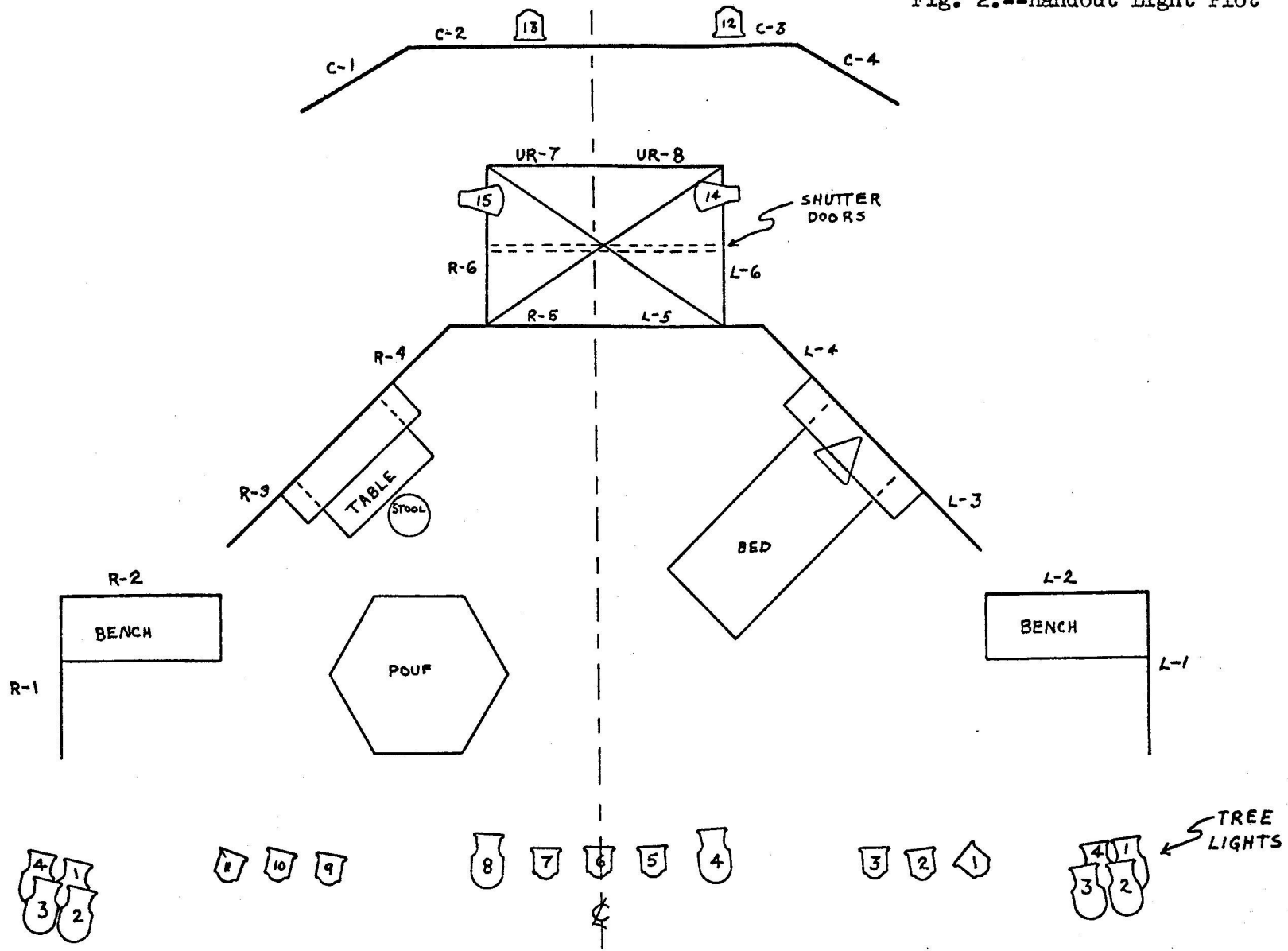


Fig. 1.--Handout Floor Plan

Fig. 2.--Handout Light Plot



∞

out the drawings is that they help hasten the set-up operations with a minimal amount of instruction and confusion. It has been found that the more responsibility these crew members are given, the more interest they show, the harder they work, and the faster and better the work gets done. The original planning of paperwork by the hired technicians takes a little longer, but it saves time on tour.

The crew assistants are usually volunteers, and they can walk out at any time, leaving the technicians to load in and set up the scenery and lighting. Therefore, it is a necessity that the Vanguard technicians be extraordinary diplomats. They must keep their helpers interested and content enough so that the work will be done correctly and the crew members will return after the performance to help strike the show and load it into the truck. (See Appendix B, #2 for some helpful hints in this direction.)

#### Scenery and Equipment

The budget, by controlling the size of the salaried technical crew, also controls the quantity of technical equipment that can be readily handled and operated by the technical crew. The dimming equipment must be operated by one technician and the sound equipment by the other. Therefore, the equipment purchased must meet specifications requiring only one operator to manipulate the controls. Student crew members often help with the dimming or switching on and off of the house lights, operating the main curtain, acting as a liaison between the stage manager and the house manager, and on occasions, helping with special effects.

The quantity of scenery that the technicians can construct, carry, and set up is also limited by the amount of the technical budget. Of course, there are other factors limiting both the quantity and type of equipment and scenery that Vanguard can tour, but it is primarily the budget that controls both. Often, there are numerous solutions to each different condition or problem on tour, but frequently it is simply the availability of funds that causes one particular solution to be used instead of another.

Scenery and properties are currently being constructed in such a way that within a few years there should be a sizeable inventory from which to select articles for almost any production to be performed. As the inventory nears completion, more and more of the technical budget now used for construction will be available for the improvement and expansion of technical equipment.



## CHAPTER II

### THEATRE FACILITIES AND TECHNICAL PRODUCTION

Along with the budget, the theatres and their facilities are existing conditions around which Missouri Vanguard must plan its technical designs in order to accomplish the production of any of the dramatic works selected. Each and every building in which Vanguard has performed has had some condition which has made it different from any other building where Vanguard has performed.

The buildings in which the theatres are found on the Vanguard tour vary; city hall (Monett), city auditorium (Moberly), movie theatre (Fort Leonard Wood), student unions (Rolla, Warrensburg), church (Kansas City), art gallery (Kansas City), fine arts buildings (colleges), junior high school (Trenton), but the majority of the buildings are senior high schools, and many of them do not have theatres. The evening performance is most often presented in a space best called a playing area; cafeteria, cafetorium, gymnasium, lecture or recital hall, general purpose auditorium, and only in some cases, a theatre.

#### Access to the Stage

Many of these buildings have situations that must be considered just to make it possible to move scenery and equipment to the stage. Often, access to a stage is across a gymnasium floor, and frequently

there are gym classes in session. The scenery must be portable enough that it can either be easily carried by hand or rolled on rubber casters so that the gymnasium floor will not be scratched. Occasionally, access to a stage is through a cafeteria, and at different times Vanguard has had to move scenery to a stage while lunch was being served. In one case, the cafeteria was actually the stage. The load-in and set-up for the assembly had to be delayed until lunch was finished.

The floor level above ground on which the theatre/playing area is located must be taken into consideration so that the scenery and equipment are neither too weighty nor bulky for either the technicians or student crew members to carry up a flight of steps. Units of equipment and scenery must break down into smaller sizes so that they can be moved by manpower alone. Neither time nor funds allow for the hiring of a crane or fork lift to raise scenic elements to an upper level theatre. The scenery and equipment, once moved to the stage area, must still be lifted to stage level, and this also limits the weight of many articles. (See Appendix B, #3.)

If there are stairs leading to an upper level, the scenery must be designed so that it is possible to negotiate the turns in the stairs without doing any damage to either the building or the scenery. If there is no access to an upper level by stairs but there is an elevator, then the dimensions of the elevator must be known so that scenery can be raised to stage level without too much difficulty. Part of the elevator at Warrensburg had to be removed so that the flats could be gotten to the stage. The expanded steel ceiling of

the elevator had to be removed because the dimensions of the elevator were too small to accommodate the flats. The flats had to be slid in and stood up at the back of the elevator. Six flats could be raised at one time because the opening in the elevator ceiling was only ten inches due to framing obstructions in the ceiling. It required a number of trips to get all of the scenery to the stage, and load-in and load-out times were lengthened because of this problem.

Another general rule that Vanguard has come to follow is to plan on constructing or purchasing items that will pass through a standard door, 6'-8" x 2'-8". There are very few buildings that have larger doors or loading doors where Vanguard performs. In some of the older buildings, door openings are even less than standard, and the size of the smallest door opening to be encountered becomes the standard for the maximum size scenic unit for that particular year.

The scenery is stacked on stage in a specific order so that the set-up of the scenery for the evening performance will be faster. If time allows, the stiffeners and jack braces are secured to the scenery before it is stacked. The breakdown properties are assembled if time permits. The scenery is then stored out of sight for the performance of the assembly program. On occasion, it has been impossible to get the scenery out of sight either because there was not enough storage space or because there were no curtains to conceal it. The load-in was delayed until after the assembly program, and this extended the set-up time for the evening performance.

Once the scenery is on the stage and stacked according to the requests of an assistant stage manager, it is too late to consider

many of the other elements of the stage itself. They must have been considered before the first piece of scenery was constructed or any equipment was purchased.

#### Stage Ceiling Height

The height of the stage ceiling is an important consideration, for in many cases it would be impossible to produce a show that required an upper level (for instance, one that was seven feet above stage level). The height of the stage ceiling limits the height of the scenery that it is possible to use on tour with Vanguard.

The height of the stage ceiling has also prevented Vanguard from using any flying scenery, partially because of low ceiling heights and lack of fly systems in the theatres, and partially because Vanguard is not yet equipped to suspend its own battens and to use tripped scenery for flying or shifting. At present, the height of Vanguard scenic flats has been standardized at 9'-6", and this measurement was set by the height of the ceiling of the stage at Clinton. Vanguard has not performed in Clinton for the last two years (1971 and 1972), but since Vanguard is building an inventory of scenery, the height of the flats has remained the same. Decorative pieces have been added to the top of the flats to increase the height of the scenery a number of times, but in theatres with low ceilings these pieces have not been used.

#### Stage Width

The width of the stage is an important guideline for the quantity and physical dimensions of the scenery used by Vanguard. Some stages

are very narrow, such as the stage at the University of Missouri-Rolla which is only 20'-0" wide. This limiting factor forces the designer to create scenery that can be reduced in size from an optimum of 28'-0". This is accomplished by either removing particular flats or making the flats hinge back out of the way so that the scenery can be accommodated in the narrow width.

#### Stage Depth

The depth of the stage is also a condition that must be considered. Vanguard designs scenery for an optimum depth of 14'-0", and when stages such as Trenton (8'-0") or Linn (11'-0") are encountered, the scenery must be flexible enough so that the adjustments can be made without too much difficulty. Again, pieces are removed if necessary and crossovers are eliminated (an event which is almost always planned for in the blocking of Vanguard productions). On occasion, the actors have no possible way of exiting from the shallow stage except at intermission when a piece of scenery is removed, enabling them to do so.

The lack of wing space on many stages requires Vanguard to eliminate shifting of scenery with wagons, and often there is no extra space in the wings for scenery to be stored even if it were to be shifted by grips. In most cases, Vanguard operates its sound and lighting equipment from backstage, and if the wing space is limited or non-existent, then this operation becomes very difficult or at least very restricted. At the University of Missouri-Rolla, the equipment had to be operated in a room adjoining the stage, and the

cuing was often difficult since Vanguard carries no sound-powered or inter-com system for communication. The lighting and sound equipment were operated in full view of the audience at Buffalo since there was barely enough space on stage for the set and the actors.

#### Stage Floors

The majority of the stage floors where Vanguard sets up are finished hardwood floors, and it is not possible to use stage screws, butt blocks or any other fastener that secures scenery to the floor because these floors are easily scratched and marred. Therefore, Vanguard must use sandbags for holding scenery and other equipment in place on stage. It is also difficult to use high platforms for there is little way of securing them to the floor to insure the safety of the actors who must mount such structures.

In a few cases, such as at Hamilton, the stage floor was so warped that it was fortunate that the doors of the set would open and close. It was difficult to make the scenery stand up since the flats were leaning forward on at least a fifteen degree angle, and many extra sandbags were required on each jack brace to keep the scenery from falling forward.

#### Sightlines

One of the most difficult items to plan for on a Vanguard tour is the sightline conditions that will be encountered. It is easy to plan on the use of the main curtain for masking. The majority of main curtains found on the Vanguard tour are the traverse type. This is very fortunate since the Vanguard scenery is planned for an

optimum width of 28'-0"; the traverse curtains are used as masking on either side of the set. If the proscenium opening were sixty feet wide and had a fly curtain, Vanguard could not properly mask the set since it does not carry any torm units to handle such a situation. On occasion there is no main curtain where Vanguard performs, or there is a curtain but there is no possible way to use it. The lack of a curtain obviously creates a masking problem, but with a considerable amount of adapting and adding units from the other sets in the truck it has been handled adequately.

Another condition that exists concerning main curtains, which does not bother sightlines as much as sight, is the color of these curtains. Frequently the curtains, when used as side masking, are in sharp contrast to the color of the set and often create a rather shocking effect. Vanguard simply has to tolerate such problems since there is little that can be done about the color of these curtains or the aesthetic imbalance they often create. It is impossible to choose set colors for Vanguard which will blend with all curtains encountered, but some consideration should be given to this eventuality by both designers and painters before a set is painted.

The height of the stage ceiling often controls the height of the borders and teasers that are on the stages where Vanguard performs. The height at which the teasers and borders are hung often causes vertical sightline problems. There are cases where the ceilings are high enough but the borders are dead-hung and permission is required to raise or lower these curtains. Most often permission is granted,

but occasionally it is not, and there is no way for Vanguard to solve a vertical sightline condition in such a case.

There are times when the downstage teaser or grand valance are too low and are secured in a fixed position, creating a vertical sightline situation for which there is no remedy. A large portion of the set can not be seen by the audience in such a case. The ornamental units of scenery that fasten to the top of the set are left off when this situation is encountered.

In theatres where there are no curtains that can be used as legs, there is a horizontal sightline problem with which Vanguard is not normally able to cope. There are very few instances when there is no vertical masking in a theatre, but sometimes there are the pull-around type curtains on tracks, and either they do not come far enough downstage or there are gaps between sections of curtains. Vanguard carries no extra masking to solve such problems.

Frequently, the height of the stage from the house/auditorium floor creates a vertical sightline situation that is difficult to overcome if the borders in the theatre are dead-hung or if there are not enough borders on the stage to do a proper job of masking. At present, Vanguard carries only two extra borders. One is an asbestos border that is dyed black, but it is usually used downstage on the first light batten. The other border is a 34-foot length of black corduroy which is used as a masking border where needed. The corduroy border often conflicts in color with the other borders on



stage, and it becomes a matter of judgment of which is better: to use the border to cover up unsightly conditions even though it causes a clash in color, or not to use the border at all.

Balconies are not found too frequently on the Vanguard tour, but the few that have been encountered have usually caused the expected sightline problems. There have been times when the whole set had to be moved downstage from its normal position so that audience members in the balcony could see the back of the set. Even when they could see the lower part of the back wall of the set, they usually still could not see the top of the back wall. A low-hanging border often caused this sightline problem.

Balconies also eliminate the possibility of using ceilings or even partial ceilings on the Vanguard sets. The angle of sight from the balconies varies so greatly over the whole tour that it is best to avoid the use of any ceilings. In a few cases, the angle of sight is greater than the 30 degrees recommended by Burris-Meyer and Cole<sup>1</sup>, and it is so great that not only is the audience unable to see parts of the set, but also the bodies of the actors appear out of proportion. It would almost be impossible for Vanguard to light a set from the first batten if there were a partial ceiling on the set. More will be mentioned about this later.

Another sightline condition encountered by Vanguard is created by the house or auditorium floor. A minimal number of the house floors

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<sup>1</sup>Harold Burris-Meyer and Edward C. Cole, Theatres and Auditoriums (2d ed.; New York: Reinhold Publishing Corporation, 1964), p.65.

have raked seating. The majority of them have flat floors. The seating on a flat house floor creates a vertical sightline situation which can be overcome if the borders in the theatre may be lowered or raised and if there are enough borders available. In the situations where borders may not be moved or where there are not enough borders, even with the addition of the two that Vanguard carries, the sightlines remain very poor for the spectators. Often, when the house floor is flat, the downstage borders must be so low to mask that the upstage top of the set cannot be seen. Again, a compromise has to be worked out to reach a somewhat satisfactory medium.

The seating arrangement in these houses varies from very good to extremely poor. The houses with raked floors, more often than not, have seating that is acceptable, but in the houses in which portable seating is set up, the sightlines are usually very poor. Most often, the portable seating is arranged at very wide angles to the stage, and at times the technicians have been in view of the spectators sitting in the front row outside seats. Extra masking flats could be carried to handle such situations, but the technicians have no idea of the seating arrangement until they arrive for set-up. It would be wise to add a question in the technical questionnaire which would cover such conditions, or ideally, a polite way could be found to suggest a seating arrangement that would be most beneficial to the audience in each community that uses portable seating. ✓

### Dressing Rooms

Even something seemingly as minor as the dressing rooms/change areas in these buildings has an effect on the technical operation of Vanguard. Frequently, there is either no water in the dressing rooms or there is only cold water. There is little that can be done about this, but without hot water there are obvious reactions from the actors. The lack of hot water can also upset the washing of such properties as glasses or silverware. This is not to say that there is no hot water in these buildings for the properties do get washed.

There are often no facilities for hanging costumes and a portable, breakdown costume rack is now carried by Vanguard to serve this purpose. This rack was constructed poorly because the parts are not interchangeable, but the faults can easily be remedied.

The lighting in many of the dressing rooms is inadequate. In order to improve this situation, both lights and portable make-up mirrors with lights attached are carried by the company. The mirrors were constructed by the technicians since none could be located that would withstand the rigors of touring. The mirrors, with lights mounted on them, are made in such a way that two of them snap together with suitcase-type clips so that neither mirrors nor lamps are exposed. There are seldom enough electrical outlets available in the dressing rooms to handle irons, steamers, lights, and make-up mirrors so extra cable is carried to take care of such shortages.

### Technical Questionnaires

A technical questionnaire is sent out to each prospective booking community covering all of the items mentioned in this Chapter. It

also contains electrical/lighting questions which will be discussed in Chapter VI. The questionnaire has been revised three times since Vanguard began in 1968. Questionnaires are still returned with many spaces left blank, probably due to the sponsor's lack of understanding of any theatre terms used. Even though the questions have been simplified and clarified using the simplest language possible, frequently the information is not provided or is inaccurate. A floor plan is requested, but not demanded. Since the technical questionnaire is such an important part of the planning of the technical aspects of Vanguard, it would be wise to ask that some photographs of the backstage area be submitted by the community because inaccurate and insufficient information serve no purpose in pre-planning for a tour.

Once on tour it would also be a good idea if the technical director were to take some pictures of particular conditions that gave problems the year he toured that facility, and in this way there would be a pictorial history for other technicians to follow in the future. Photographs were taken the first year of Vanguard, but most of them were of the stage scenery rather than of technical limitations. A technical check list, with a space for notes covering these limitations, is filled out each day of performance by the technical director or his assistant. A sample technical questionnaire and daily check list can be found at the end of this Chapter.

**TECHNICAL QUESTIONNAIRE FOR MISSOURI VANGUARD THEATRE**

City: \_\_\_\_\_

Name of theatre, auditorium or place of production: \_\_\_\_\_

Street address of auditorium: \_\_\_\_\_

Name, address, and telephone number of person in charge of building or auditorium (Principal, etc.): \_\_\_\_\_

Name, address, and telephone number of Arts Council President or head of sponsoring organization: \_\_\_\_\_

Name, address and telephone number of theatre's electrician (local electrician, maintenance man, etc.): \_\_\_\_\_

Name and address of person in charge of stage area and crews WHO WILL BE PRESENT at loading dock when truck arrives for crew call: \_\_\_\_\_

A FLOOR PLAN OF THE STAGE AREA IS REQUESTED, INDICATING POSITION OF CURTAINS, ELECTRICAL FACILITIES, ETC. ATTACHED YOU WILL FIND A SHEET FOR THIS PURPOSE. PLEASE LABEL THOROUGHLY.

**A. MEASUREMENTS (THE FOLLOWING MEASUREMENTS MUST BE AS ACCURATE AS POSSIBLE IN ORDER TO INSURE THAT VANGUARD SCENERY WILL WORK IN YOUR THEATRE.)**

1. Where is stage located? (Ground floor, 2nd, etc.): \_\_\_\_\_
2. Height of proscenium opening: \_\_\_\_\_ Width of pros. opening: \_\_\_\_\_
3. Height of grid or stage ceiling: \_\_\_\_\_
4. Depth of stage from curtain to back wall (if there is any immovable object against or on the back wall, indicate depth up to the object and show on floor plan): \_\_\_\_\_
5. Width of stage from wall to wall: \_\_\_\_\_
6. Distance from proscenium wall to stage wall or immovable object.      Wing right: \_\_\_\_\_      Wing left: \_\_\_\_\_
7. What is the height of the stage floor from the auditorium floor: \_\_\_\_\_
8. From auditorium floor to stage, how many steps are there: \_\_\_\_\_



D. POWER REQUIREMENTS

VANGUARD CARRIES ITS OWN LIGHTING INSTRUMENTS AND DIMMER SYSTEM. IT IS NECESSARY TO USE OUR OWN DIMMERS AND IT IS THEREFORE NECESSARY TO HAVE THE PROPER AMOUNT OF POWER LOCATED IN AN EASILY ACCESSIBLE AREA.

1. Location of switchboard or fusebox: (Power source should be backstage and within 12 ft. of proscenium \_\_\_\_\_ (If source is not within 12 ft., a temporary service must be run in for operation of lighting equipment.) PLEASE INDICATE POSITION ON ATTACHED FLOOR PLAN.
2. Power requirements - AC (adjustments should be made by a qualified electrician)
  - a. 3 wire single-phase with minimum of 70 amps per hot leg? \_\_\_\_\_
  - b. 2 wire single-phase with 140 amps service? \_\_\_\_\_
 (If not immediately available, a temporary service should be run with one of the above power ratings.)

E. AUDITORIUM

1. Is the floor of the house or auditorium raked or flat? \_\_\_\_\_
2. Is there a balcony in the auditorium? \_\_\_\_\_
3. What is the distance from the front of the balcony to the front of the stage? \_\_\_\_\_
4. What is the auditorium seating capacity? \_\_\_\_\_

F. DRESSING ROOMS

1. We need two well-lighted dressing rooms (one for men and one for women). Where will they be located? \_\_\_\_\_
2. Is there water in the dressing rooms? \_\_\_\_\_ Hot water? \_\_\_\_\_
3. Where is the closest restroom to the dressing rooms? (Also indicate on floor plan) \_\_\_\_\_

G. LOADING

1. Please indicate specifically where the truck should be parked for the purpose of unloading scenery, props, etc. and INDICATE AREA ON FLOOR PLAN. \_\_\_\_\_
2. From the outside entrance to the stage, what is the smallest doorway which must be passed through to gain access to the stage? \_\_\_\_\_

3. From the outside entrance to the stage, how many steps are there? \_\_\_\_\_

NOTE: THE DRESSING ROOMS AND STAGE SHOULD BE CLEARED AND CLEAN AND CREWS AVAILABLE WHEN THE VANGUARD TRUCK ARRIVES. CREW CALLS WILL BE MADE AT A LATER DATE.

Technical Questionnaire Submitted by:

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Address)



## FLOOR PLAN

(PLEASE INCLUDE THE FOLLOWING AND LABEL AS THOROUGHLY AS POSSIBLE:  
Stage area including proscenium opening, all back stage areas showing  
any obstructions such as stairwells, exits and entrances, loading  
area, location of electrical batten, location of switchboard, location  
of curtains and location of dressing rooms.)

DATE: \_\_\_\_\_ STAND: \_\_\_\_\_

DESTINATION: \_\_\_\_\_

DEPARTURE TIME: \_\_\_\_\_ ARRIVAL TIME: \_\_\_\_\_

MILEAGE: \_\_\_\_\_ MILEAGE: \_\_\_\_\_

LOAD-IN BEGAN: \_\_\_\_\_ COMPLETED: \_\_\_\_\_

SET-UP BEGAN: \_\_\_\_\_ COMPLETED: \_\_\_\_\_

LIGHTS COMPLETED: \_\_\_\_\_

STRIKE BEGAN: \_\_\_\_\_ COMPLETED: \_\_\_\_\_

LOAD-OUT BEGAN: \_\_\_\_\_ COMPLETED: \_\_\_\_\_

DEPARTURE TIME: \_\_\_\_\_ ARRIVAL: \_\_\_\_\_

MILEAGE: \_\_\_\_\_ MILEAGE: \_\_\_\_\_

REMARKS:

## CHAPTER III

### TWO-DIMENSIONAL SCENERY

The completed technical questionnaires give the technicians an indication of the size, shape, bulk, and weight of scenery that it will be possible to use on tour. Once the technicians know the above limitations, they must consider methods of constructing scenery that will be durable and withstand the rigors of touring.

#### Flat Construction

The Vanguard technicians began constructing durable flats for the first season of Vanguard (1968). Some of these flats are now in their fifth season of touring and have needed little, and in some cases, no repairs.

The method of construction for Vanguard flats takes longer than it does for the standard type of flat, but the extra strength achieved is well worth the time spent. By standard flat type is meant that it is constructed with corner blocks and keystones fastened on the outside of the stiles and rails with clout nails, screws, or staples.<sup>2</sup> The style of construction for Vanguard flats is similar to that of mortise-and-tenon, but since the equipment to construct mortise-and-tenon flats is so expensive, a simpler way to achieve similar results is used, and the flats are sturdier

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<sup>2</sup>Harold Burris-Meyer and Edward C. Cole, Scenery for the Theatre (Boston: Little, Brown and Company, 1938), p. 127.

than mortise-and-tenon flats. The only equipment required for this flat construction is a table saw and two sets of three saw blades, or one set of saw blades and a set of dado blades. The saw blades and dado blades have other uses in a scene shop, so there is no special equipment required to make these flats.

The outside frame, stiles, rails, toggle rails, and corner braces are exactly the same as those of a standard flat, and it is only in the joining of parts together that these flats differ from any others. The corner blocks, keystones, and half-keystones are all inserted into the middle of the stiles and rails by cutting a one-quarter inch slot into them to the proper depth with dado blades or saw blades. (See Appendix B, #4.) The keystones and half-keystones obviously must have a different shape than normal because one end must be shaped to the same arc as that of the saw blades or dado blades. The corner blocks, keystones and half-keystones are covered with either plastic resin or white glue and inserted into the slots of the rails, stiles, toggles, and corner braces. Then they can be secured with either clout nails or #2 cement coated nails, but the most satisfactory method is to use a pneumatic staple gun with 3/4" staples on both sides of the frame. The clout nails tended to split the pine stiles and rails; the #2 nails did less splitting, but coated staples secured the best and caused no splitting. Since Vanguard has no template bench, a Jiffy Multi-Purpose Clamp is frequently used when there are a number of flats with the same dimen-

sions to be constructed.<sup>3</sup> (See Figures #3 and #4 for corner block and keystone construction.)

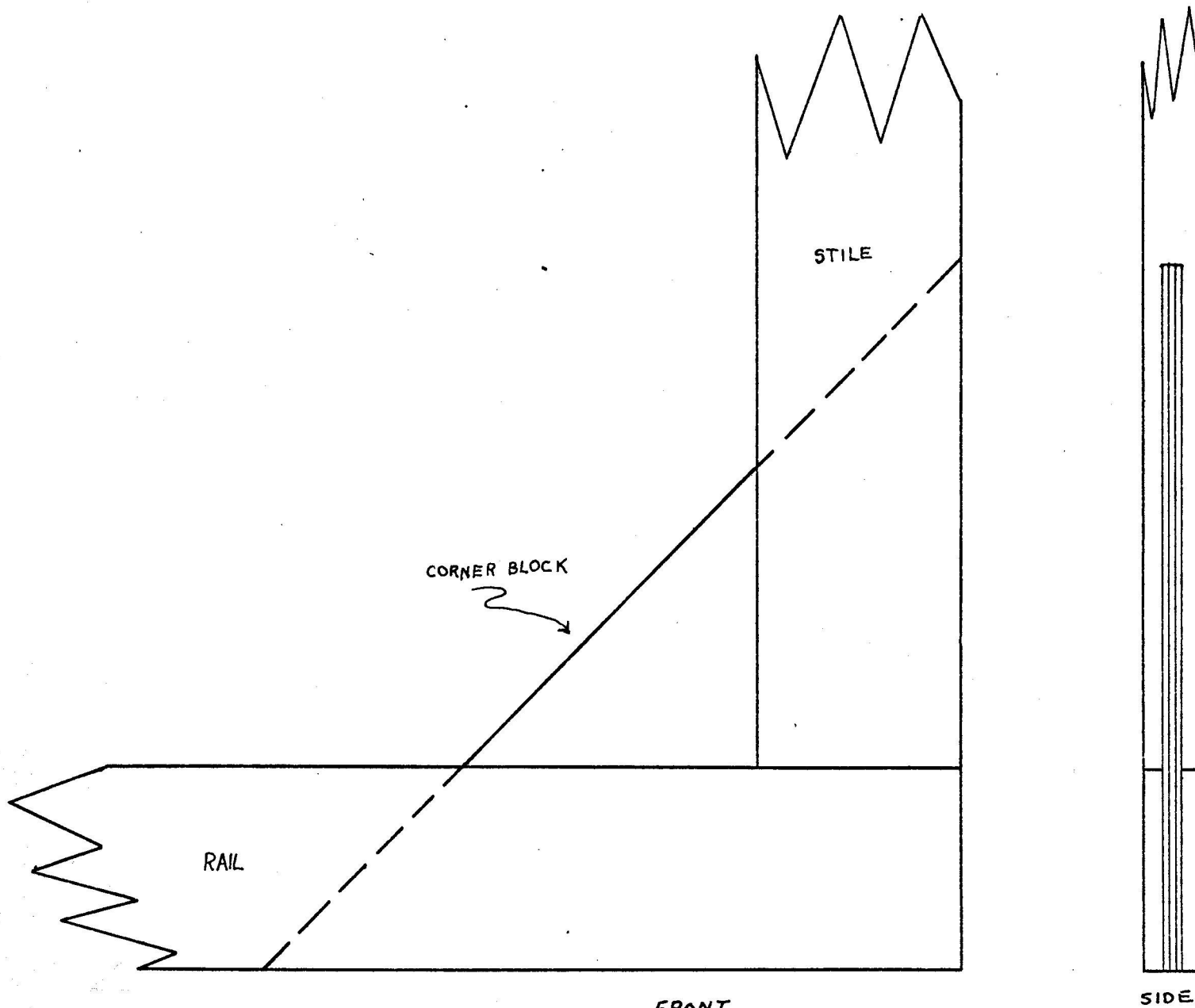
The greatest disadvantage of these flats is that they cannot be rebuilt easily. Once the glue sets, the flats are permanently together. When necessary, picture toggles are easily added by fastening them to the inside of the stile with 3/4" x 2" metal corner braces. Since these flats are not easily rebuilt or easily destroyed, it is possible to accumulate an inventory of stock scenery, which is a present goal of Vanguard.

The insert corner block type of construction not only gives added strength to the flats but also saves one-quarter inch thickness on each flat because the corner blocks and keystones are inside of the frame. The reduced thickness saves from four to six inches of space in the truck when there are twenty or more flats being used. Since the keystones and corner blocks are recessed, the flats are easily pulled in and out of the truck or flat dolly. Flats can also be stacked, face to face or face to frame without doing much damage to the painted surface.

As has been stated previously, Vanguard flats are 9'-6" in height (with the exception of six masking flats of which four are 9'-0" and two are 10'-0"), and they vary in width from 1'-0" to 5'-0" in six-inch increments. The maximum width of 5'-0" has been set for easier handling and also for storage in the truck.

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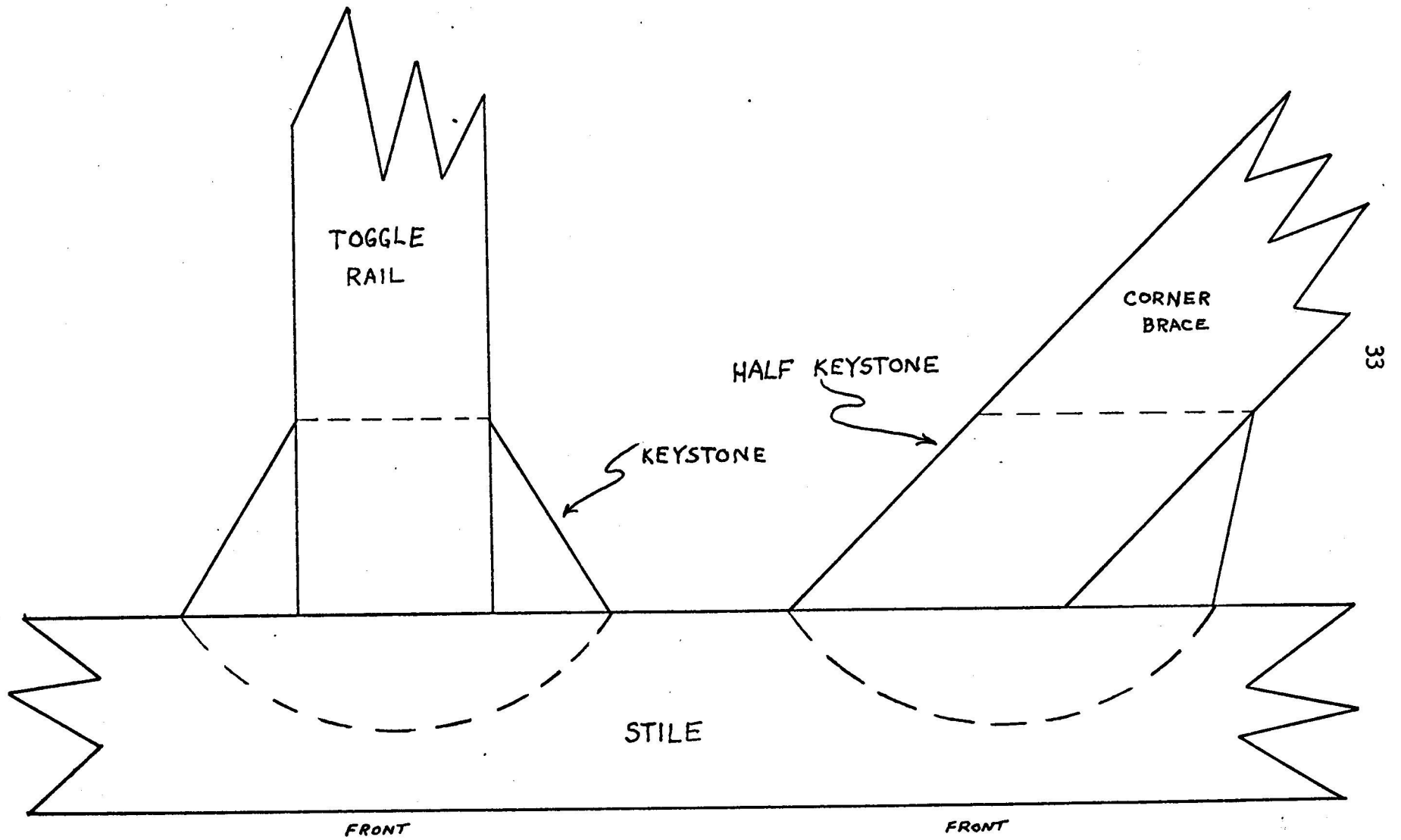
<sup>3</sup>"Jiffy Multi-Purpose Clamp," Workbench, XXIV (September-October, 1968), 46-47.



FRONT  
Fig. 3.--Corner Block Construction

SIDE

Fig. 4.--Keystone Construction



## Flat Covering

Vanguard flats were covered with #140 pinecrest sheeting for the first two years of Vanguard (1968-1969), but since that time they have been covered with 8-ounce scenic muslin. The sheeting was not very durable, but it was less expensive than scenic muslin. This sheeting has now become more expensive than scenic muslin, including shipping costs.

The muslin is secured to the flats with a mixture of white glue and water, mixed 1 part glue to  $3/4$  part water, rather than with dope because the white glue is more water resistant than the amber flake glue.

The muslin is secured around the edges of the stiles and rails and trimmed off on the edge instead of the face of the flats. It is slightly more difficult to secure the muslin around the corner than on the face, but there are a few advantages in this method. By fastening the muslin around the edges, it is possible to eliminate the use of metal corner supports on the bottom rails to protect the flats from damage. The stiles and rails splinter much less when they are either slid out of the truck on the stiles or when they are run across the stage floor on the rails. After the muslin is glued down around the edges and trimmed, the edges are painted a number of times with polymer.<sup>4</sup> This is done each year Vanguard reuses a flat. It gives some added protection, and helps keep the muslin secure at the edges.

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<sup>4</sup> Polymer and Vin-Wall are polyvinyl acetate emulsion products sold by the Paramount Paint and Lacquer Company which is a division of Zolatone Process, Inc. of Los Angeles.



After the flats are flameproofed, they are sized with either Vin-Wall or polymer to aid in hiding dutchmans. When the flats were covered with #140 pinecrest sheeting, #128 pinecrest sheeting was used for dutchmans, and the system worked relatively well but not perfectly. This light sheeting was tried again the first year Vanguard used scenic muslin, and the dutchmans were visible because of the difference in texture of the two materials. In 1971, fibreglass dutchmans were applied with polymer, but since the flats were not sized with polymer, there was a textural difference between the dutchman and the muslin. The dutchmans also cracked after only a few folds of the booked flats because the polymer was applied too heavily. (A test dutchman was used at the time of acceptance of the paint system, and it folded more than one hundred times before the dutchman cracked.) This year (1972) the muslin was seamed together before being applied to the new flats constructed, and no dutchmans were used. The stock flats that were used this year had dutchmans made of the same muslin that was used to cover the flats, and they have been the most successful dutchmans yet applied by the Vanguard technicians. The seamed muslin has come out the best appearing of all, and this was an accidental piece of knowledge learned by the Vanguard technicians when tearing apart some scenery donated by the Performing Arts Foundation of Kansas City.

#### Flat Painting

The type of paint that Vanguard uses on its scenery is somewhat unusual since Kansas City is probably one of the only places where it is likely to be purchased for stage use. A Kansas City

distributor of performance materials worked out the paint system with a local theatre director, and at present, Vanguard is the only local theatre group consistently using the system. (See Appendix B, #5.)

The paint system uses three principle products. One product is white glue which is a polyvinyl resin product, and it is used to secure the muslin to the flats. The other two products, Vin-Wall paint and polymer, have already been mentioned. All three of these products are water soluble.

At the time that Vanguard was introduced to this paint system, the advantages and disadvantages were pointed out to the technical director. The main advantage is that the more frequently the scenery is painted, the better the surface is supposed to become. Vanguard has yet to use the system long enough to know if this is true because textural materials were added to the flat surfaces for one tour.

The muslin on the flats should originally be sized with polymer applied straight from the can with a large putty knife or a stiff paint brush. The fibreglass that is used in this system is ten mils thick and the polymer, if applied correctly, is also ten mils thick. The principle of patching or dutchmaning flats is to fill in the pores of the fibreglass with polymer and to feather the polymer into the sized flat. If the polymer is correctly applied, there is no possibility of patches or dutchmans showing once the scenery is painted with Vin-Wall. It is possible to patch a hole the size of a

football on the face of a flat and still maintain the original surface strength of the muslin. Another good feature of the paint is that it is highly flameproof.

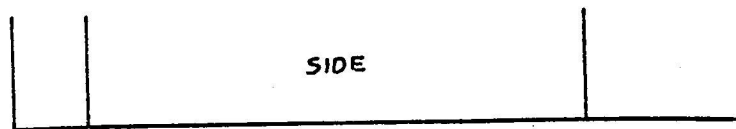
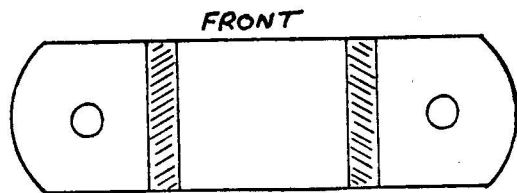
One of the disadvantages of this paint is that it adds a good deal of weight to a flat, more than would dry pigment scenic paint. Another drawback is that it is available only in white, and must be colored with universal tints, making it very difficult to mix dark hues; and also, universal tints are relatively expensive.

#### Flat Hardware

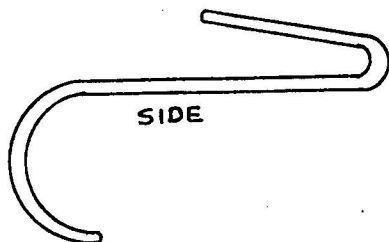
The hardware that Vanguard uses on its flats is usually standard scenic hardware, but in some cases hardware is fabricated to serve specific purposes. Special removable lash hooks have been made from picture hooks so that the flats could be stacked neatly. Separable hinges have been made from butt hinges. Also, standard scenic hardware is often fabricated because it is less expensive than purchasing the item from a theatrical supply company. Lash cleats are often made from band iron. All of the saddle irons are fabricated for the Vanguard scenery by the technicians. (See Figure #5.)

Hinges on the face of the flats are recessed with a router, and if they are to be covered with a dutchman, a 3/16 inch bolt is used on each side of the hinge. Both bolts and epoxy cement are used to secure the hinges whenever added security at particular stress points is desired. Gluing is not frequently done since the hinges are difficult to retrieve without causing some damage to the

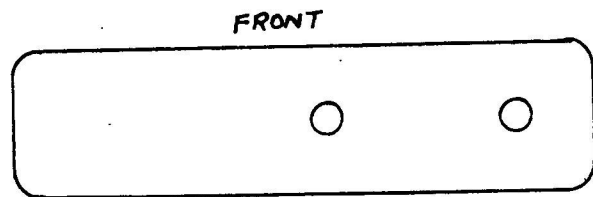
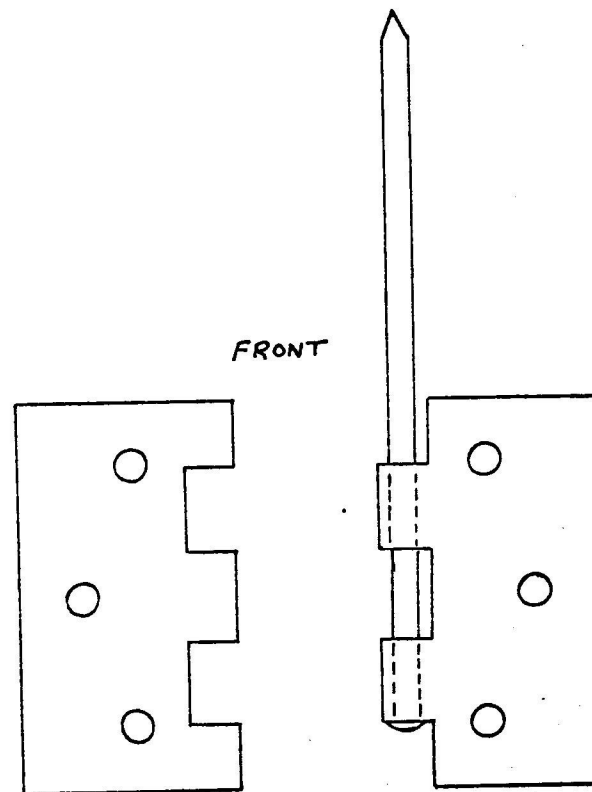
Fig. 5.--Fabricated Hardware



ADAPTED LASH HOOK



SADDLE IRON



LASH CLEAT

SEPARABLE HINGE

flats. Hardware is attached so that it will not protrude from the flats any more than necessary and so that the flats can be stacked evenly and not mar the face of another flat when they are booked together. It is often necessary to use a great deal of removable hardware which is fastened on with bolts and wing nuts. Picture hooks are used extensively for many articles other than pictures.

Saddle irons are used in preference to straight sill irons because they offer better support. The irons are fabricated from 1/4" x 3/4" band iron instead of the lighter 3/16" thick band iron. Pivoting saddle irons are used on booked flats with large openings. Double pivot saddle irons, spaced one inch apart, are used instead of single pivot saddle irons. (See Figure #6.) The double pivot saddle iron functions better in allowing the flats to book without putting any strain on the screws securing the saddle irons to the flats.

#### Flat Stiffening and Bracing

The stiffeners that Vanguard uses are the typical type used on most scenery<sup>5</sup>, and the only requirement that is placed on them is that they be removable and easily stacked. Since sandbags have to be used exclusively for support of scenery, none of the jack braces have foot irons, and stage braces are also impractical. Vanguard uses both the rigid type of jack brace and the hinged collapsible type.<sup>6</sup>

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<sup>5</sup>W. Oren Parker and Harvey K. Smith, Scene Design and Stage Lighting (2d ed.; New York: Holt, Rinehart and Winston, Inc., 1968), pp. 219-220.

<sup>6</sup>Ibid., p. 220.

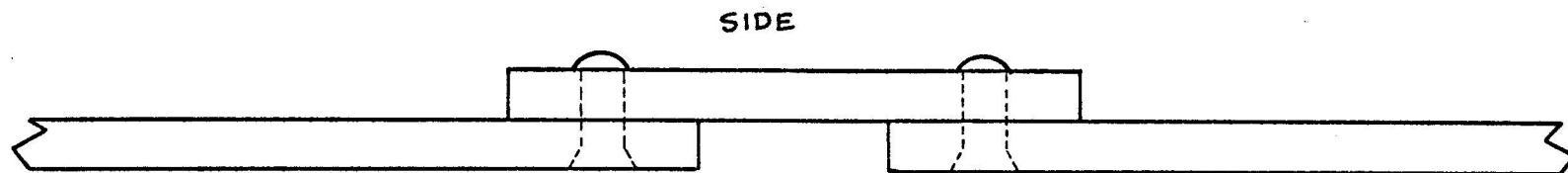
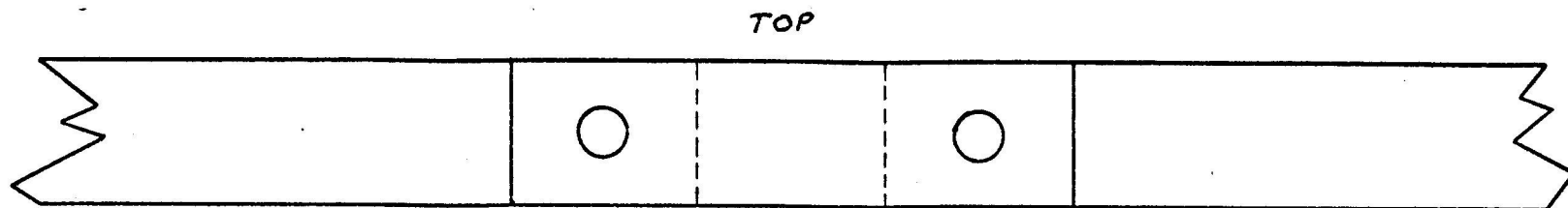


Fig. 6.--Double Pivot for Saddle Irons

The rigid type is used only when a substantial support is required, or when there are to be large quantities of weighty ornamental pieces added to the top of the flats. The rigid type takes up more space in the truck than does the hinged type, and for this reason, the hinged type is used most frequently. The hinged type of jack braces support scenery sufficiently, and they can be stacked and bolted together so that they store more easily in the truck and take up less space. The disadvantages of the hinged type of braces are that they do not provide maximum bracing support, and they are easily broken at a hinged joint. Since all door units are units separate from the flats, they require their own support bracing. All of the jack braces are the rigid type, and they are loose-pin hinged to the door units.

An experiment was made in 1971 while attempting to eliminate the loose-pin hinges on jack braces and frames. Separable hinges were fabricated from two-inch butt hinges, but they caused more problems than they solved. It took as many as three people to stand up one double door unit -- one person on each jack brace and one person to hold the door unit. The failure resulted from the fact that the pin in one half of the hinge was made from a #16 common nail instead of a harder piece of steel. The soft pin was frequently out of alignment with the other half of the hinge and had to be bent by hand to get the jack brace secured to the door frame.

The stiffeners used most often by the Vanguard technicians are the type utilizing a 1"x3" on edge with alternating loose-in hinges joined to the stiles of the flat. They are easily removed and easily bundled to store in the truck. Once or twice, batten hooks and 1"x3"'s

have been used for stiffeners when a quick change has been required. These stiffeners do not have the stiffening strength of the type mentioned above, but at times, it has been necessary to use them.

The units of booked flats are usually secured together with loose-pin hinges, but on occasion, lashing is used if there is to be a fast shift. There are times when loose-pin hinges are used even for a quick shift, for example, when there is a door unit butting into a corner. During the run of a performance, lashing has become loose, creating problems. The type of loose-pin hinges that Vanguard prefers for pinning scenery together on the rear is cut off strap hinges and a #20 nail as a pin. These hinges are larger and easier to put together than the two-inch back flap loose-pin hinges.



## CHAPTER IV

### THREE-DIMENSIONAL SCENERY

Because of the requirements of space on stage and also for storage in the truck, three-dimensional elements of scenery are constructed so that they can be broken down into smaller units. During the beginning years of Vanguard, the physical size of many of the three-dimensional units was not considered very thoroughly by the technicians, and frequently, there were pronounced problems. The failure was not that of the designers, but that of the technicians.

#### Step Units

A standard cut carriage or trestle type of step unit<sup>7</sup> consumes a large amount of space in the truck, and it is often bulky to carry. Without fabricating steel step units, these two types are probably the strongest available. The parallel type of construction for step units can be used, but this type of unit also consumes needed space in the truck.

For the past three years, Vanguard has constructed step units that completely break down into sections and store in a box. The box is castered, and it is usually the top level of the step unit. Hinged carriage units pin to the side of the box and the treads and

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<sup>7</sup>Parker and Smith, Scene Design and Stage Lighting, pp. 182-183.

risers are dadoed so that they inter-lock and hold themselves together. In this way the balasters and railing all can be stored in one castered box which uses only a regular-shaped space in the truck, and they can be easily moved to the stage.

#### Platforms

Because of the excessive weight and bulk, the standard type of platform construction (3/4" x 4' x 8' plywood top framed with 2" x 6"'s) is no longer used by Vanguard. Vanguard made and used two standard platforms the first year of tour. One of them was made from a ping-pong table top that was 5' x 9' and framed with red fir 2" x 6"'s. It was made in such a way that a smaller platform could be stored inside of it by making the center braces removable in the large platform. This one large platform required as many as three crew members to carry, and it used up six inches of space in the truck. These platforms have never needed any repairs, but they warped so badly that shims were required to get them seated on the floor securely.

If this type of platform were to be required in the future, consideration should be given to making the platforms in sections so that it could fold up to make a storage box. By attaching removable casters to the platform/storage box, it could easily be moved to the stage.

Parallel-type platforms have not yet been tried by Vanguard. They have been avoided for two reasons: first, they are not particularly durable for touring; and second, their heights are not adjustable. If the parallels were constructed with insert corner

blocks like the Vanguard flats, they would be more durable. But parallels would require large quantities of storage space if varying height platforms were required for a production.

It would be most desirable to construct platforms with metal framing and extension legs, and then both the weight and bulk would be reduced to a reasonable limit.<sup>8</sup>

This year (1972), Vanguard constructed some standard-type platforms framed with one-inch stock and braced at the corners with angle iron. The platforms are padded with insulation board and are quite heavy, about 110 pounds each, so the weight and bulk have not been reduced. The most interesting feature of these platforms is in the legging system used. The legs are 4' x 4"'s cut to the height desired, and they are held in place by cams. (See Figure #7 and #8.) The best feature of these platforms is the speed with which they can be set up and struck. Also, they are quite versatile; the height can easily be changed simply by stocking varying height legs which install with a tap of a mallet. These platforms probably tour no better than any standard platform, but the legging is an item that might have other uses on a tour. This year the truck will be empty of other scenery when they are required to tour, for they will be used mainly during the one-week local tour in Kansas City.

#### Door and Window Units

The door units used by Vanguard are cased door units adapted slightly for ruggedness.<sup>9</sup> All of the door units are the free-standing

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<sup>8</sup>Parker and Smith, Scene Design and Stage Lighting, p. 178.

<sup>9</sup>Burris-Meyer and Cole, Scenery for the Theatre, p. 221.

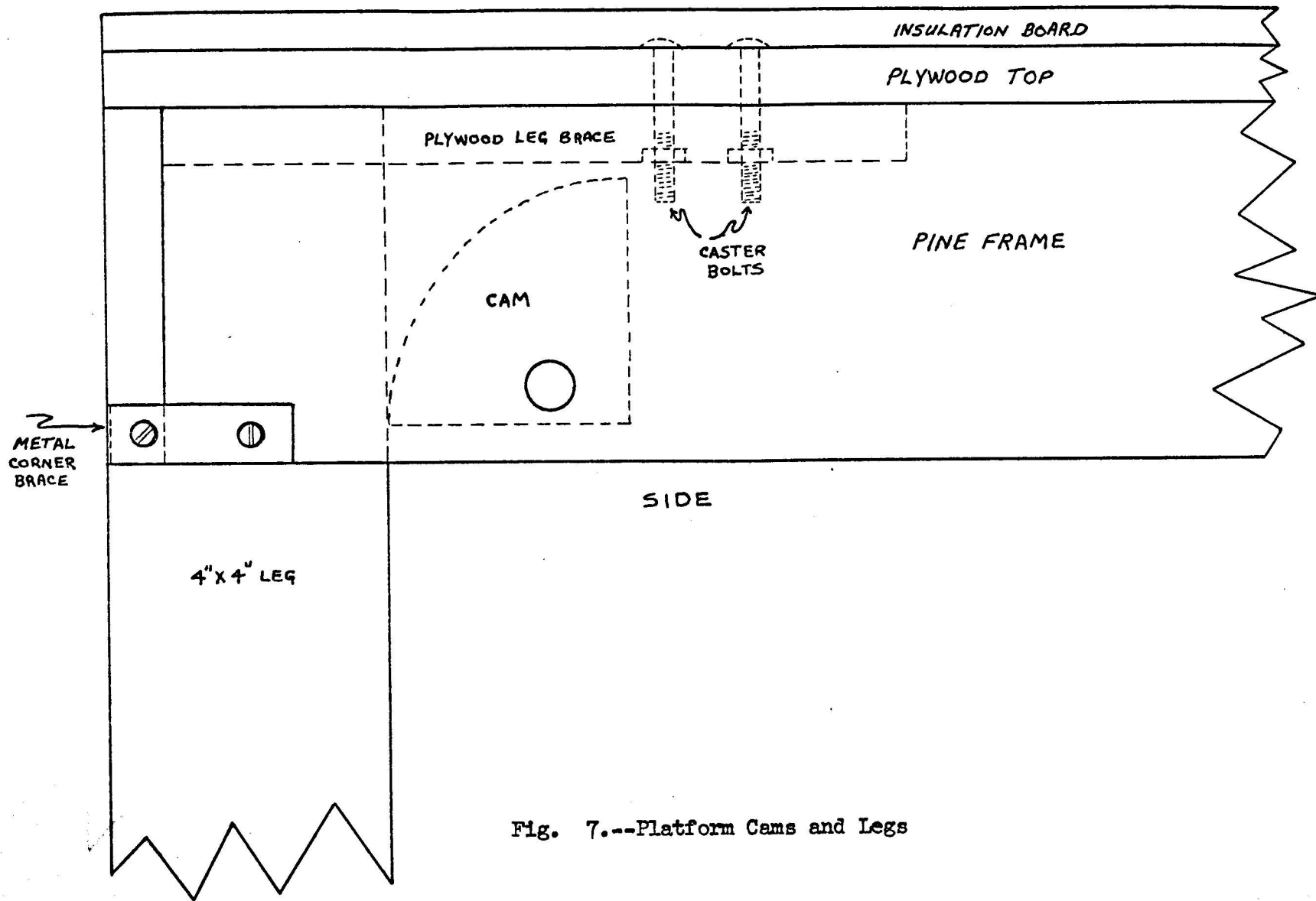
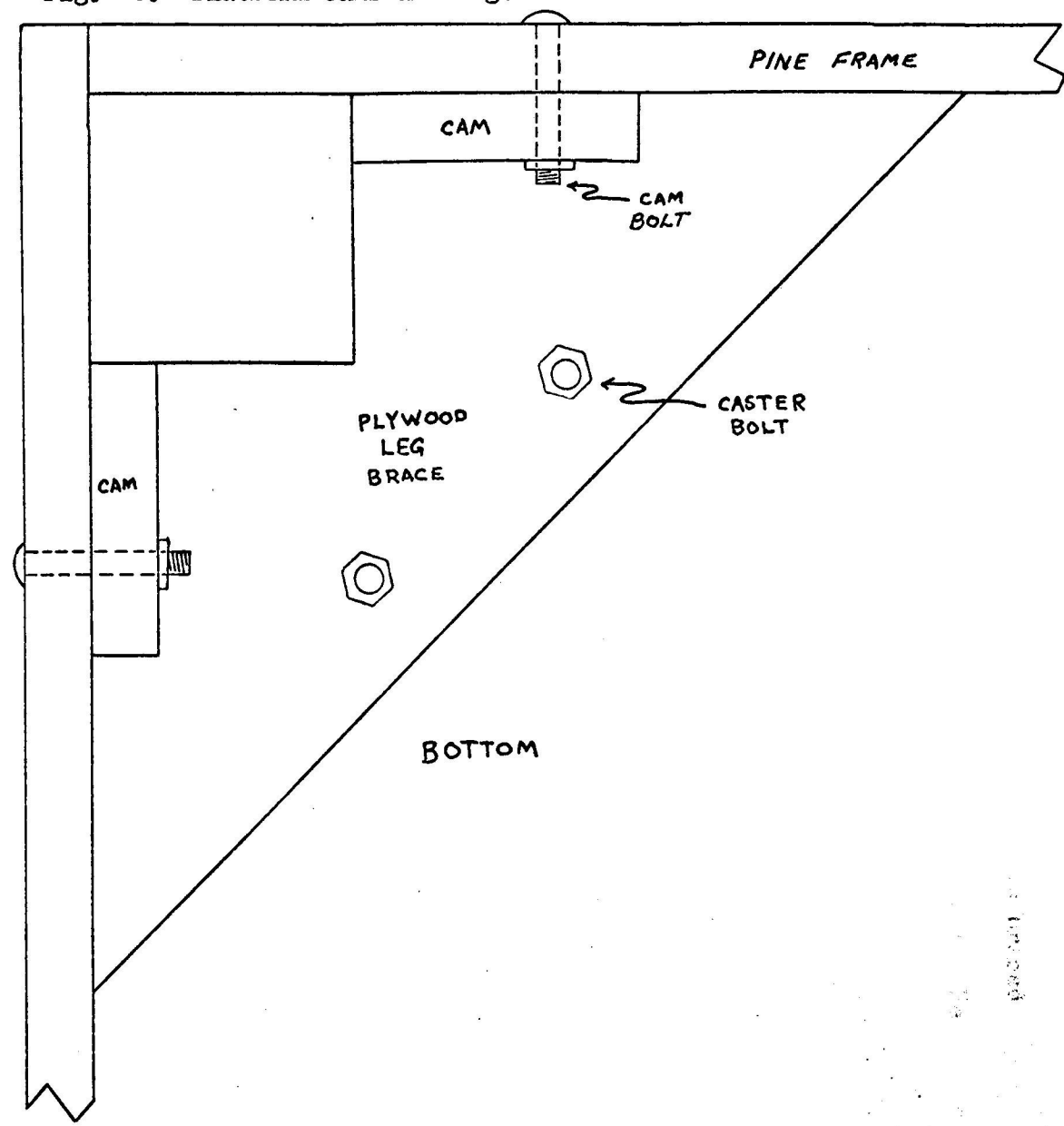
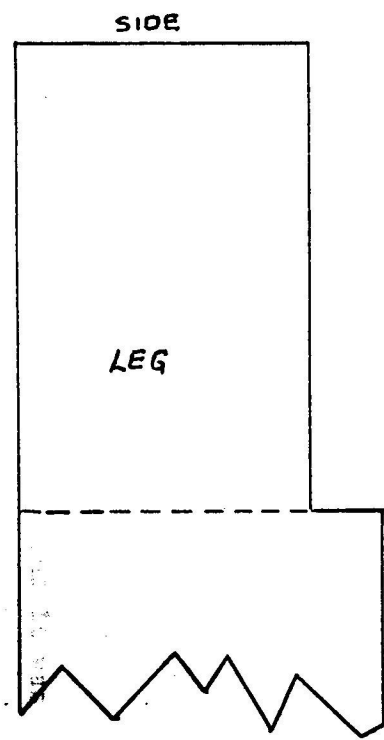
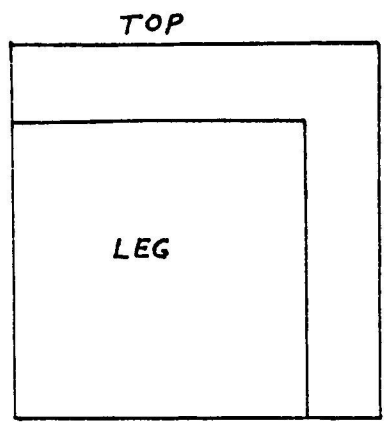


Fig. 7.--Platform Cams and Legs

Fig. 8.--Platform Cams and Legs



types that do not touch the scenery, and each door unit is braced with jack braces. The free-standing units primarily eliminate the problem of scenery shaking when doors are closed.

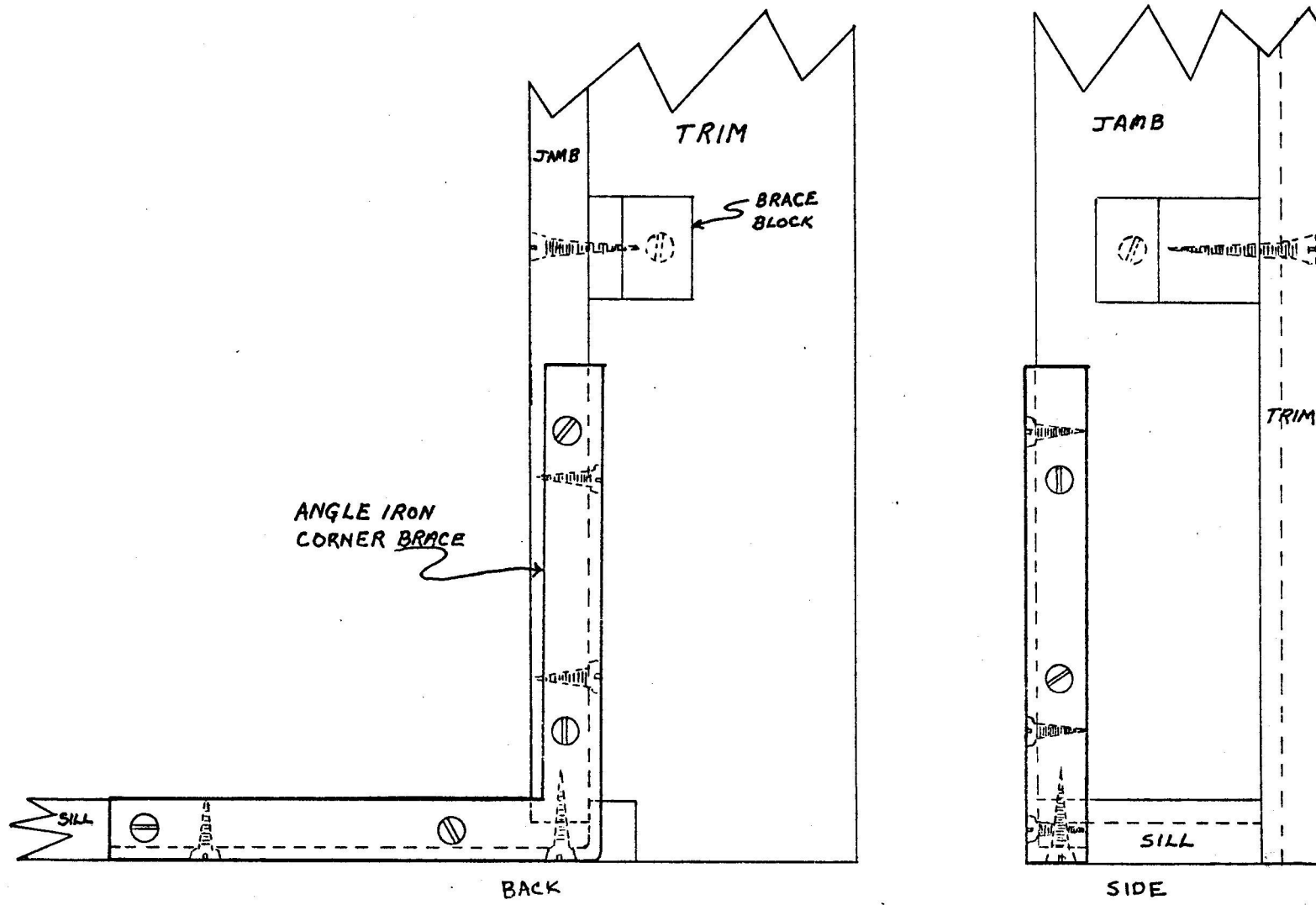
The major adaptation on the door frames is that the jambs, header and sill are all dadoed before fastening, and the trim is also dadoed and half-lapped and glued to the thickness. The sills are dadoed to accommodate the depth of the saddle irons. All of the four back corners of the thickness are secured with  $3/4$ " angle iron that has been bent to a right angle and then fastened to the thickness so that there can be no give in the frame. (See Figure #9.) The shutters are regular commercial types, usually seconds, hollow core flush doors with windows and trim added wherever necessary. Regular passage sets are used instead of rim latch sets, principally because they are more trouble free. Butt hinges are used throughout on all doors because they are more trouble free than any other hinge yet utilized.

Thus far, the window units for Vanguard have all been constructed in the flats, and they have not had to be carried as separate units. All windows used have been non-practical with the exception of one unit. This window had a vertical hinged sash which remained in the flat for storage.

#### Ramp

The only other unusual piece of three-dimensional scenery that Vanguard has yet constructed was an ellipsoidal-shaped ramp. The ramp had a major axis of 20'-0" and a minor axis of 16'-0", and it was raked from 0'-1" to 1'-6", front to back, respectively. The ramp

Fig. 9.--Angle Iron Door Frame Brace



was built so that it could be quickly and easily assembled and dismantled. The most interesting feature of the unit was that the plywood top fastened to the angled ramp braces with hanger bolts, and it could be secured quickly with a ratchet wrench and hex nuts.

### Puppet Theatres

Two puppet theatres have been fabricated by the Vanguard technicians for the grade school program. The first theatre was made from one-eighth inch masonite into the form of a box, with shelves inside and with two swinging doors. The dimensions of the box were 10" x 30" x 36". Corduroy curtains on steel rods were fastened to the top of the box to form legs and borders for the stage. The puppets, rods, and curtains were stored inside. The unit rolled on a removable board with casters (much like a skateboard). This puppet theatre was very light and easily moved by the puppeteer. It was also very easy to set up for operation.

A second puppet theatre was constructed this year (1972) because the original theatre was too small. Additional storage and stage space was required because the number of puppets was increased from two to five, and they were made larger.

The current theatre is more of a two-dimensional unit than the original. It has a number of frames covered with indoor/outdoor carpeting which are hinged together so they open out, fold down, and become a stage.

The present puppet theatre is stored in a box on top of one of the rented station wagons. There are no castered units to move it,



and it must be carried by hand to any area where there is to be a performance. It is a disadvantage to have to carry the theatre by hand, but it is an advantage to no longer have it in the truck where the technicians would have to load and unload it as many as three times each day while on the road touring.

#### Ornamental Units

Ornamental pieces of scenery such as cornices, columns, railings, and moldings must be constructed so that they are durable and compact. The pieces that fasten to the set must be lightweight and strong because the jack braces can only support a certain amount of weight. If the pieces were too heavy, it would be necessary to add taller, rigid-type jack braces for support, and they would consume needed room in the truck.

Once a large ornamental piece of scenery such as a cornice is constructed, it is necessary to find a safe storage space in the truck since such a piece of scenery does not adapt to being stacked neatly in a pile or bundle. There has always been a small amount of breakage on ornamental, filigree pieces. It would be a definite advantage if ornamental units could be broken down into smaller pieces so they could be stored in a box.

## CHAPTER V

### PROPERTIES AND TECHNICAL PRODUCTION

#### Set Properties

For the first year of Vanguard, particular pieces of furniture in keeping with the style of production were requested from each community. The request was primarily made in order to save space in the truck and to save handling large furniture pieces. Pictures were sent to each of the communities concerning the style, type, and color of these pieces of furniture, but many of the communities did not find the appropriate style of furniture available. A great deal of the stage manager's time was occupied in looking at the available furniture (usually located in a home or building at some distance from the theatre) in the community. The furniture was usually accepted because there was nothing more appropriate available.

After the first year's experience of borrowing properties from the community and the dismal failure in most instances, the idea was abandoned. It was decided that large set properties should be made to break down for storage. Since that time Vanguard has carried all of its own properties. In fact, the borrowing of properties in general has stopped because properties undergo rough treatment on tour, and they have to be repaired and rebuilt constantly. It is simply cheaper and easier to purchase or to construct any properties

needed so that they will suit the decor of the scenery. Since 1969, the Vanguard technicians have been building or rebuilding all of the furniture properties, and it has been a steady learning process of construction and storage of these items.

During the years of tour 1969 and 1970, an antique sofa was carried, and each year it had to be almost totally rebuilt because of the damage that it underwent in the truck. In both 1971 and 1972, sofas were fabricated so that they would break down into pieces and easily store in a large, castered furniture box which carried most of the furniture. These two sofas were easily assembled and dismantled.

Tables, benches, bookcases, sinks, stoves, cabinets, refrigerators, fireplaces, beds, desks, stools, radios, poofs, etc., have all been fabricated so that they would either break down into smaller units or so that the whole unit would become a storage unit itself. The kitchen counter with sink and stove that was used in The Subject was Roses was a storage cabinet for many articles of trim and dress properties, and it was castered so that it was easily moved to the stage.

A product called snap clips has been ordered by a local hardware wholesaler at the request of Vanguard personnel. The clips have not come into stock yet so they have not been tested by Vanguard for scenic purposes. From the information available, it appears that these clips should be very useful to Vanguard for construction of breakdown furniture. "After you attach the hardware you simply slide the pieces together and the tongues of the various pieces of hardware

lock into a slot of the mating pieces. To separate the locks you simply press with a screwdriver."<sup>10</sup>

It must be admitted that many of these properties, though sturdy, are still rather unprofessional in appearance. With more training and time on the part of the builders, the properties should improve in quality and appearance.

#### Hand Properties

The policy for hand properties is the same as that for set properties -- build or buy the property, do not borrow it. Hand properties are stored in specific properties boxes and wrapped with newspaper each night after use, but there is still too much breakage of these properties both in use and in hauling.

The properties boxes have removable tops with extendable legs that fasten back into the box and thereby become properties tables. The boxes are hauled in and out of the truck with special dollies made specifically for transporting them. The dollies are also a valuable asset on stage for the properties tables can easily be moved around the stage so that they are out of the way of any scene shifts. Also, they can easily be shifted from one side of the stage to the other if required.

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<sup>10</sup>"'K-D' Hardware," Workbench, XXVII (November-December, 1971), 49.

## CHAPTER VI

### LIGHTING AND TECHNICAL PRODUCTION

#### Power Source

One of the sections on the technical questionnaire that Vanguard sends to each community makes several inquiries concerning the electrical power available and its proximity to the stage. Vanguard lighting equipment can operate on either a 120 volt single phase two-wire system or on a 240 volt single phase three-wire system. The amperage rating per hot leg is required as stated in the sample questionnaire. Vanguard requests that the power source be within twelve feet of the proscenium wall, and if it is not, that a temporary power service be run in to accommodate the requirements of Vanguard's equipment.

There have been a few cases where there has not been sufficient power available at particular sources (sometimes in the entire building) to allow full usage of the lighting equipment designed for a production. The performance was interrupted at Nevada one year (1970) when the fifty-ampere circuit breakers tripped at the beginning of the second act of the production. Another source of power was available, and it was connected into the system and production continued. At Excelsior Springs the amperage rating was not high enough, and the intensity of the lighting had to be run at a lower level

than normal. In this particular case, there was nothing that could be done to alleviate the problem.

If the power source is too far away from the stage, and the community has not complied with the request for a temporary service, the only thing Vanguard can do is to carry longer power cable of its own to connect to the source. When longer power cable is used, a voltage drop often occurs, and the lighting system is not at full operable capacity.

For the first two years and the beginning of the third year of touring, Vanguard carried a #6-3 power cable. The cable had large alligator clips on one end to connect to the source of power and a box with two 50-ampere female range connectors at the other end. The cable was seventy-five feet long, and it served its purpose very well until Vanguard increased beyond the rated amperage capacity of the cable. During a performance at the University of Missouri-Rolla, a 50-ampere male range connector began to melt during the performance.

Some single strand #4 cable was then made up into a new power cable (3 wires), and at each end of the cable a new type of automotive connector with an 80-ampere rating was installed. The single strand #4 cable has never caused any problem. The automotive connectors caused difficulty because the insulation at the connectors began to fuse together. This was mainly due to the creation of an improper balance of the load on each of the 120 volt legs feeding the dimmer boards.

In 1971, Tweco welding connectors<sup>11</sup> with a 100-ampere rating were purchased. These connectors have the advantage of locking once they are pushed together and turned. They have served very well thus far for Vanguard.

The power requirements have changed from the first year of Vanguard when a maximum of 13,200 watts of power could be drawn when the dimming equipment was used at full capacity. This made the original requirements of the power source either 60 amperes per hot leg in a 220 volt source, or 120 amperes on a single phase 110 volt line. Presently the power requirements are for 21,800 watts of power at 100 amperes per hot leg in a 220 volt system or 200 amperes in a 110 volt system. This quantity of power is not actually required by Vanguard because at the present there are only enough instruments available to draw 14,800 watts of power, or 70 amperes per hot leg on a single phase 220 volt source.

#### Out-Front Beam Lighting

Fire codes and the arrangement of the auditorium seating affect the positioning of the lighting equipment out front (normal beam positions are usually non-existent), and the lighting design and execution are controlled by the seating.

The vertical angle of throw from the light trees that Vanguard carries is a shallow 20 degrees and usually a wide 60 to 80 degrees. The distance of throw is a short 30 feet. The light trees extend

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<sup>11</sup>Tweco Manufacturing of Wichita, Kansas.

to only twenty feet in height, and because the stage is at least three feet higher than the auditorium floor, the actual height of the lighting equipment is only about seventeen feet. With the twenty-foot, A-frame-type ladder that Vanguard carries, the out-front trees cannot be higher than twenty feet and still enable the technicians to reach the lighting instruments for focusing. Also, the ceilings of some auditoriums are very low, and the light trees cannot be extended to their full height.

Portable seating is often spread out at very wide angles to the stage, forcing the light trees to be placed in such a manner that the horizontal angle of throw from the side is often very wide. Because the trees have rather large bases (3'-0" x 3'-0"), there are times when an aisle would be blocked, thereby breaking a fire code; the lights have to be positioned at extremely wide angles on the floor, or they have to be placed on the apron of the stage.

There have been existing conditions in various buildings where Vanguard has performed which have resulted in the out-front lighting having to be located in unusual positions. When aisles would have been blocked, and there has been no room on the stage apron for the trees, or when no balcony railings have been available, the trees have been laid down sideways and lashed to some balcony seats, and then the instruments have been mounted on them.

All of the lighting equipment was rented for the first Vanguard tour (1968), and the trees that were rented were inadequate in most



respects. The bases of the trees were round (made from one-inch pipe bent in a circle), and they were warped and quite unstable. The lights could only be raised to a height of about sixteen feet. The trees themselves were made of two sections of pipe which telescoped inside each other. The trees came apart by unthreading the sections, and after continued use, the threads began to strip. One of the couplings on the base of one tree was almost totally stripped by the end of the tour. The top crossbars were also threaded to the vertical pipes, and though none of the threads stripped at this point, they were still troublesome. Another disadvantage of these trees was that the instruments had to be hung one at a time after the tree was raised to its proper level. Also, a hex wrench had to be carried to lock the set screw for the telescoping sections.

The following year, Vanguard fabricated a set of trees for the out-front lighting, and with the exception of the bases, they have functioned very well. The bases are welded angle-iron frames, three feet square. They should be larger, but they are difficult to store in the truck at present, and if they were larger, they would also block the aisles. Each tree needs a minimum of eight sandbags on the base to make it stable. The trees are tied off with tie lines any time it is possible to do so. Wooden wedges are carried in a spare parts box in the truck in case the trees have to be set up on raked auditorium floors and need leveling.

The vertical section of the trees is made from Telspar<sup>12</sup> four-hole square tubing, with one section telescoping inside the

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<sup>12</sup>Telspar square pipe was purchased from Unistrut Midwest, Inc. of Kansas City.

other, and the verticals then slide into a square welded section on the bases. All that is needed to secure the sections together is  $3/8$ " bolts and wing nuts. (See Figure #10.)

The arms from which the instruments hang are also made out of square tubing and function like side arms, except that they slide over the top vertical section. They are secured in place with bolts and wing nuts as are the instruments to the side arms. The complete system is put together without a wrench, and it is very easy for one person to quickly get the trees ready to raise. The instruments are fastened on the side arms, cabled and plugged while the tree is lying on the floor across a chair. The whole system is raised by one person while another foots the base. It takes approximately ten minutes to set up each tree, hang the instruments, and plug and run the cable. This time could be cut down a little more if pivot pins such as those used in scaffolding were used at particular points in the system.

Balcony railings are often used for the out-front lighting positions, but the vertical angle of throw from most balconies is very low. The process of hanging instruments on a balcony railing is slower than using the trees, but at times it is an absolute necessity to use balcony railings. First, the instruments have to have the C-clamps put back on, and then each instrument has to be carried to its position, mounted and cabled.

When an instrument is mounted on a balcony railing, it must be done in such a way that there is neither the danger of some audience member burning himself on a hot instrument, or of blocking the vision

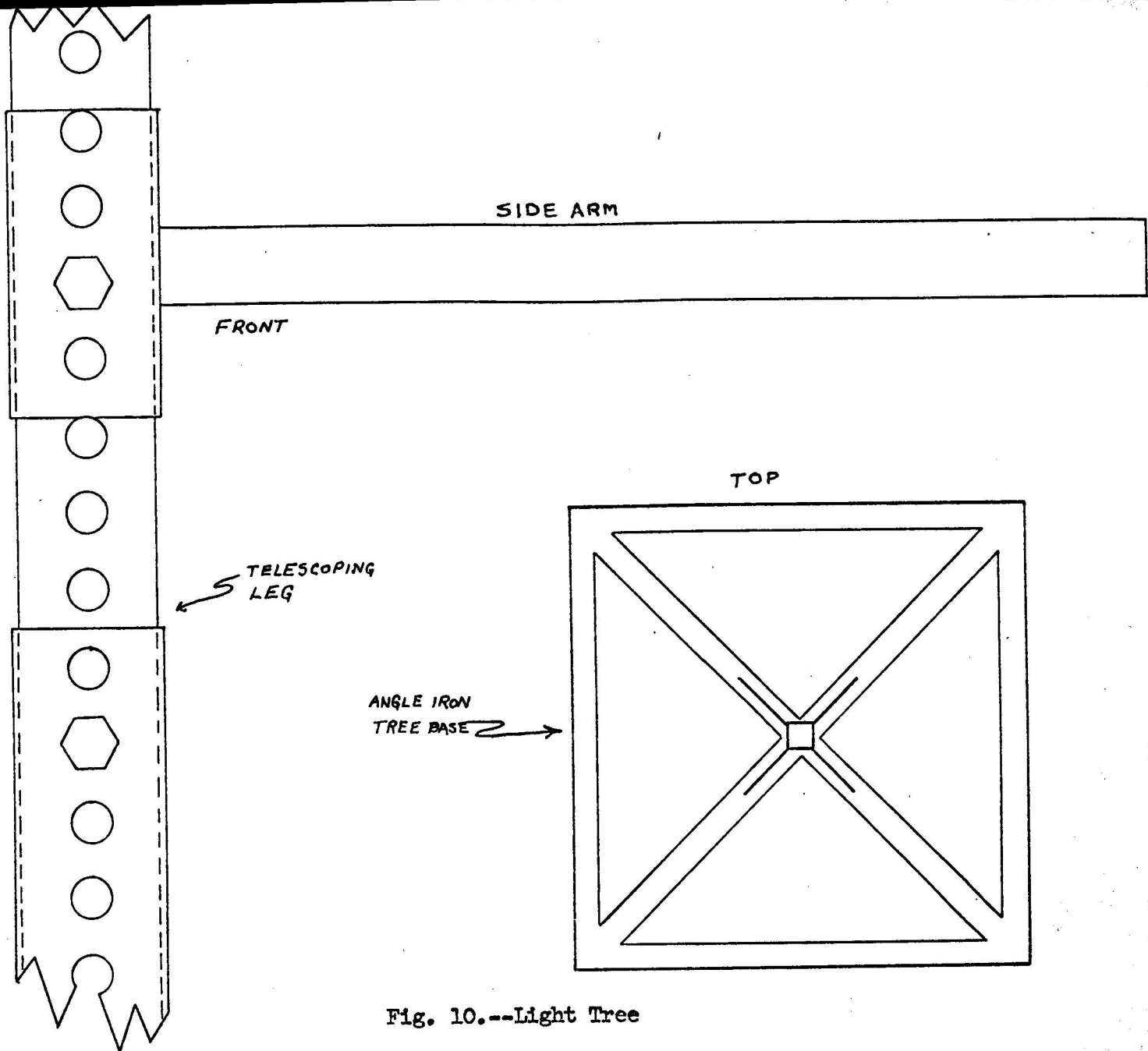


Fig. 10.--Light Tree

of a seated audience member. This often necessitates the hanging<sup>in</sup> of instruments out in front of the balcony railing which makes focusing quite difficult. Once the instruments are focused, the lamp is usually burning in an improper position. The only type of lamp that will withstand this positioning is a tungsten halogen lamp. Vanguard has used tungsten halogen lamps for out-front lighting since they purchased their own lighting equipment.

Safety chains should be used on the out-front lighting instruments at all times, but they are an absolute necessity when instruments fastened to a balcony railing are hanging directly over the audience below.

Vanguard has encountered a few balcony railings that were not secure. The railing pipes rolled when the instruments were mounted and made focusing difficult and often impossible. Frequently the railings were secured so they would not roll, but at other times, the tree had to be used for the out-front lights.

#### Hanging First Light Batten

Since the first year of Vanguard, a hanging first light batten has been carried. It is used whenever the theatre has no available light batten and when it is safe or possible to hang the batten. Most of the theatres in which Vanguard performs have no light batten and one must be rigged. In order to rig the hanging light batten it is necessary to utilize ceiling hooks, I beams, roof bridge bracing, curtain chains or anything else that is available from which to hang chains to support the batten. Often, the only available supports from

which to hang a chain are too far upstage to be of any great use in lighting from the first pipe position, and the lights are focused straight down on the actors.

The hanging first pipe is made from three sections of  $1\frac{1}{4}$ " galvanized pipe with a coupling at each joint. The sections are ten feet long so that they can be easily stored in the truck, and so that shorter lengths are available in case a stage is narrower than thirty feet, such as the 20-foot stage at the University of Missouri-Rolla. The batten is replaced every other year because the threads are usually worn, thereby weakening the batten. The hanging batten is suspended from a minimum of three welded link chains which have snap hooks at one end and S-hooks at the other. There have been times when as many as six chains have been used to support the batten, but this has mostly been done when it has been necessary to bridle the batten between two sets of curtain chains.

Whenever it is possible, the optimum height of fifteen feet is used for the first light batten. Many theatres, however, do not have facilities from which to hang a light batten at this height, and the quality of the lighting suffers from the short distance of throw.

#### Portable, Legged First Light Batten

Whenever it is impossible, or unsafe, to put up the hanging first light batten, Vanguard must rig a legged, free-standing light batten in its place.

In 1968, a theatrical agency offered to construct a portable legged first pipe system, but the price was prohibitive. If the

agency had been given enough notice that such a device might be required, they probably could have fabricated one, and Vanguard could have rented it. An estimate and a design for a legged first light batten was obtained from a Kansas City ornamental iron works firm, but again, the price was prohibitive and the weight was excessive. An extruded aluminum light batten was purchased from a northwestern theatrical lighting company, with the assurance that this batten would be self-supporting (that is without suspending cables) over a thirty-foot span and mounted at each end on legs. The contrary was the case, for when two men, one at each end of the thirty-foot section, picked it up, it bent and broke apart. The batten was in ten-foot lengths with aluminum supporting brackets between each section. These supporting brackets gave way with no extra weight from lights, cable, or asbestos border on the span. The aluminum light batten has not been renovated by Vanguard thus far, but it is possible that in the future, with an expanded school program, this batten or sections of it could be made useful.

The legged light batten was finally fabricated by the technical crew of Vanguard, and it was a disappointment. The vertical leg supports were telescoping steel pipe with a set of collapsible tripod legs for a base. Each vertical leg had mounted on it a boat trailer winch with a 12 to 1 reduction gear ratio. The horizontal span was  $1\frac{1}{4}$ " pipe with a downward V strut at the middle and pulleys on each end of the pipe. The principle was to use the winches with steel cable to force the pipe back to a horizontal position as weight was added to it. The system worked only up to a certain point of tension

and weight, and then the horizontal span would suddenly spring either upstage or downstage. The original system was designed to push the horizontal pipe back to the correct position. After this failed, the system was changed so that the horizontal pipe would be pulled back up to a level position, but instead of bowing the horizontal pipe sideways, it bent the vertical legs from base to top. No matter how great the failure of this system was, it functioned well enough to get Vanguard through two performances on tour and through technical and dress rehearsals at the American Legion Hall in Kansas City. (See Figure #11.)

A new, portable legged first pipe system was designed for Vanguard by the Engineering Department of the University of Missouri-Kansas City the second year (1969). It has been found to be very efficient the few times that it has been needed. An aluminum truss system was designed consisting of three thirteen-foot sections which are clamped together with scaffolding swivel clamps so as to spread to a width of thirty-two feet. (See Appendix B, #6.) The legs consist of two scaffold sections that are 5'-0" x 2'-6" at the base and extend to a height of eleven feet. An  $1\frac{1}{4}$ " pipe is swivel-clamped to each scaffold unit to raise the height of the legs to fifteen feet. The truss is then clamped together on the floor and raised by block and tackle to the proper height where it is clamped in place with swivel clamps. (See Figures #12 and #13.) Once the truss is clamped in place, the whole system is very rigid, and it has a minimal sag either loaded or unloaded. It takes about fifteen minutes for two technicians to complete the set-up of the system and to be ready to mount instruments and cable on it.

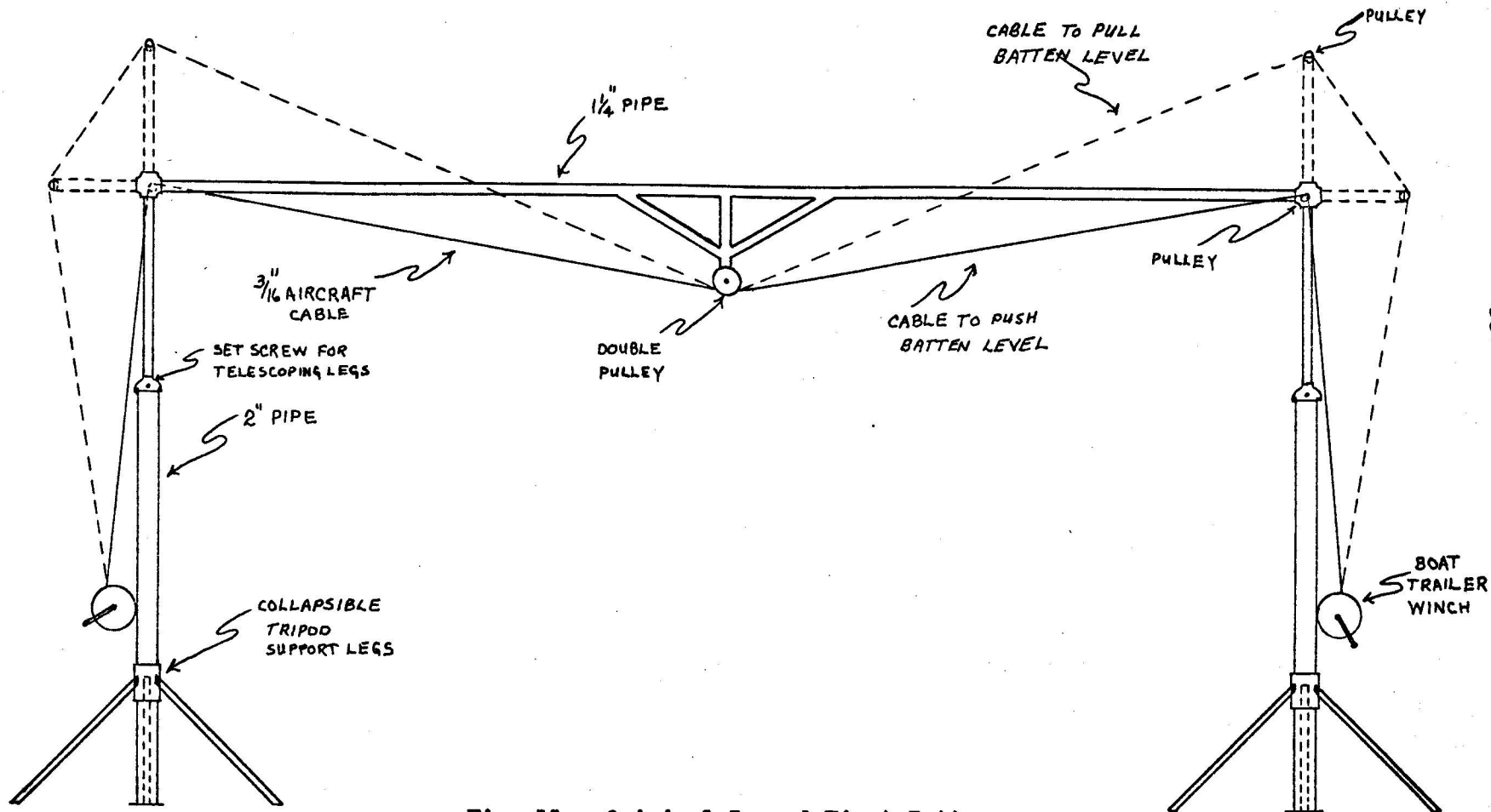
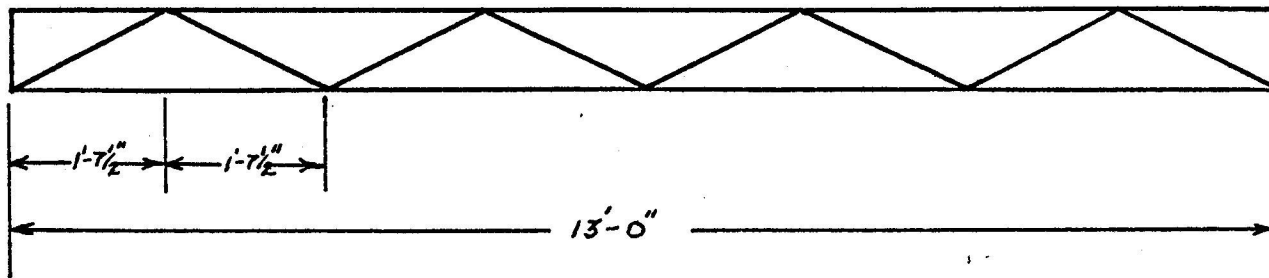
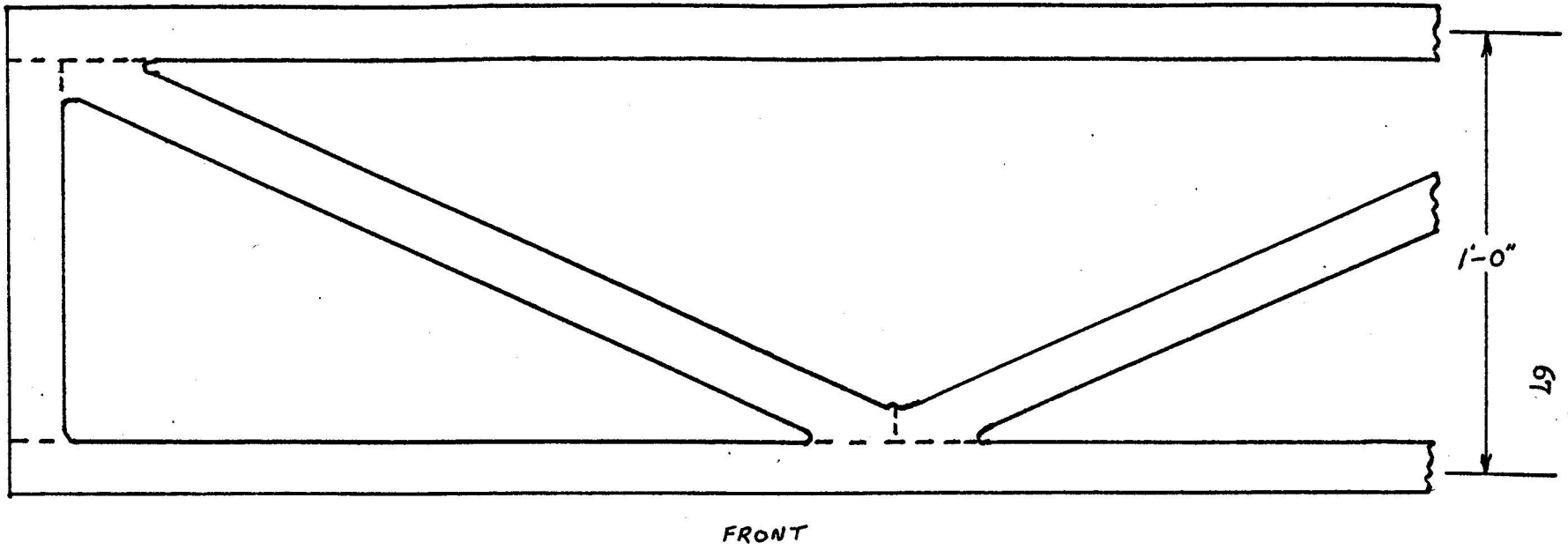


Fig. 11.--Original Legged First Batten



Fig. 12.--Aluminum Truss



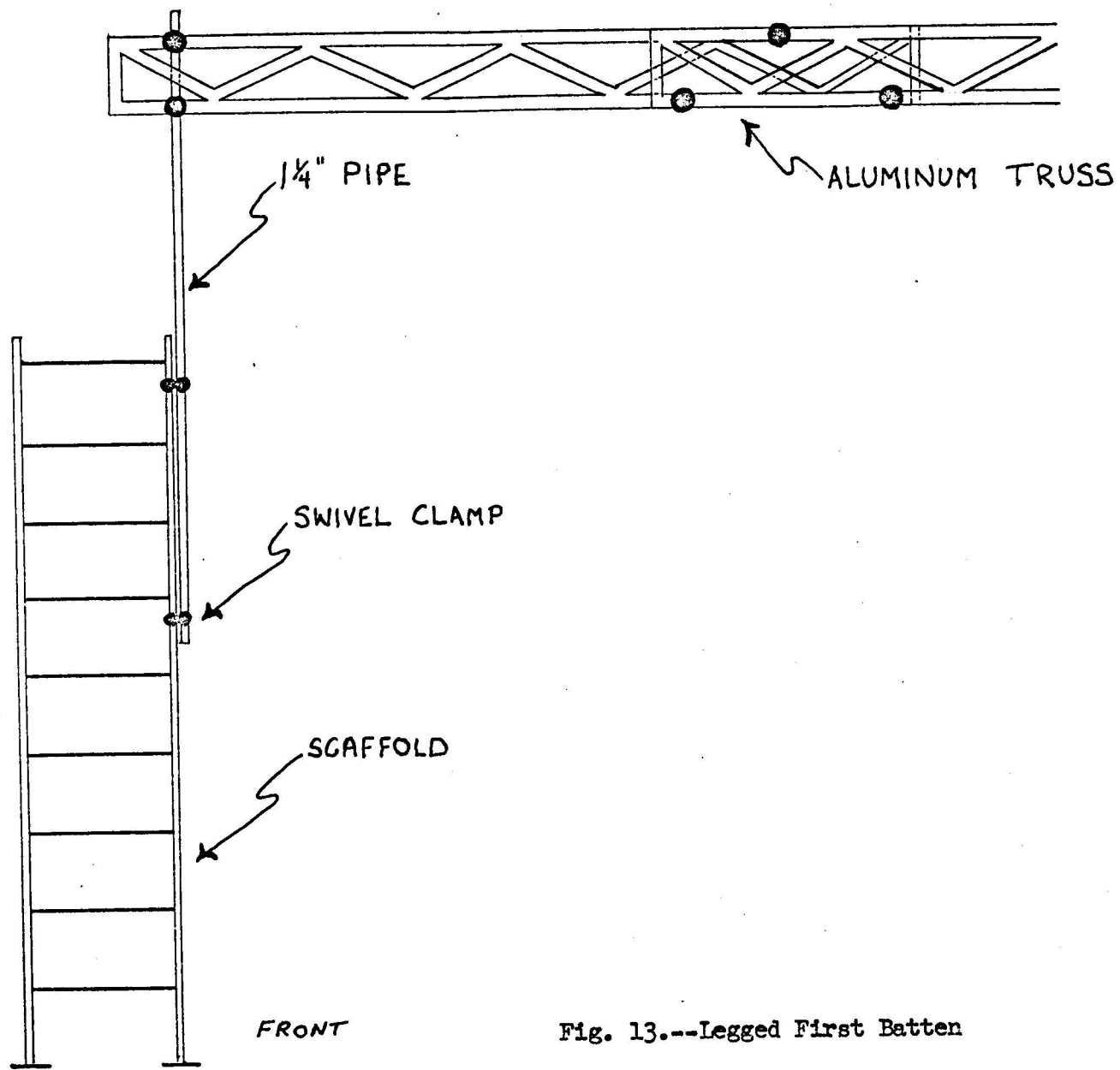


Fig. 13.--Legged First Batten

There are occasions when the use of this legged first pipe creates some problems. The scaffold legs occupy five feet of needed playing space, and if a stage is narrow, it is not possible to use the legged first batten. Also, the set designer has to be aware of the fact that when this legged system is used, any doors designed in a set near the downstage corners cannot be used. This problem has not occurred thus far since each designer has designed to avoid such an occurrence.

There have been situations encountered when neither the hanging batten nor the legged first light batten could be used because of a shallow stage, and all of the lighting had to come from out front. This has occurred every year that Vanguard has played in Trenton which has an eight-foot stage depth. Vanguard does not carry enough ellipsoidal spotlights to light from out front alone, and fortunately, in Trenton it is possible to adapt some of their lighting equipment to aid in lighting the stage. Trenton has its lighting instruments wired directly into circuit breakers, and Vanguard has had to lift the wires from the circuit breakers and, with adapters, add them into the dimming equipment. A polarity problem existed, and a number of fuses were blown before the cause was found.

#### Dimming Equipment

The dimming equipment for lighting was also rented the first year of Vanguard, and was found to be too heavy. One of the two dimmer boards rented was a six dimmer, no master, auto transformer type, rated at 1000 watts per dimmer. It was difficult to operate

and weighed about 135 pounds. The larger board weighed about 240 pounds, and it was a six dimmer, mastered, 1200 watts per dimmer, auto transformer board. It was much easier to operate than the smaller board, but moving either of these boards to a theatre on a second story of a building was a definite problem. Neither board ever totally failed in operation, but both of them had to be repaired frequently until lock-tite was placed on the nuts and bolts that were constantly shaking loose because of the vibrations in the truck.

The following year (1969), Vanguard purchased its own dimming equipment, and it has never regretted the purchase of this piece of equipment. A Scrimmer was purchased from Electronics Diversified.<sup>13</sup> The board (Model SYS-2-3-6) is a six dimmer, 3000 watts per dimmer, mastered two scene pre-set board. The SCR dimmers have independent/master switches and also A and B sides on each dimmer. The total weight of the board is 115 pounds and it is easily portable, particularly since it is stored and carried in a casted box. The only problem ever encountered with the dimmer board has been dimmer oscillation. The company made a few field modifications and eliminated most of the oscillation. Occasionally there is still some oscillation in this equipment due to many different causes: vibrating filaments in lamps, feedback from other dimmers, and on occasion, variations in the line voltage.

Five supplemental dimmers have been added to handle specials and backing lights. Two dimmers are 1000 watt, SCR, household-type dimmers, and three dimmers are 600 watt household type. The curve

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<sup>13</sup>Electronics Diversified of Portland, Oregon.

of these dimmers is different from those of the Scrimmer board, but they function adequately since they are a self-contained, separate unit.

### Lighting Instruments

Vanguard rented and borrowed the lighting instruments for the first tour. The borrowed instruments needed repair and alignment, and most of the shutters in the ellipsoidal spotlights were badly burned and could not be shuttered accurately for specials. All of the instruments, borrowed and rented, used incandescent lamps. Many times the hanging positions were such that when focusing the instrument, the lamp was burning in the incorrect position, and a few extra lamps were consumed as a result.

In 1968, the instruments were stored by hanging them from racks in the truck. It was discovered early on tour that pieces and parts were shaken loose during traveling. Thereafter, the parts were tightened each night when they were mounted in the truck, but the problem continued to occur.

Eight six-inch ellipsoidal spotlights were purchased in 1969 from Kliegl Brothers.<sup>14</sup> They are model 1355Q instruments with interchangeable lens barrels for wide (6x6) and narrow (6x9) angles, and the instruments are UL rated to use tungsten halogen lamps of either 500, 750 or 1000 watts. Vanguard has used only the 750 watt EHG lamp thus far.

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<sup>14</sup>Kliegl Bros. Lighting, Inc. of Long Island City, New York.

These instruments served extremely well the first year they were toured, but the second year, faults began to show up in them. The lamp sockets, made by Sylvania, were literally burning up from the excessive heat. When a new lamp was inserted in an instrument, the lamp was burned out quickly because of an arc in the burned out socket. Fourteen lamps were burned out during the tour from this cause alone. The pin-type sockets were permanently wired and extremely difficult to repair. A few sockets were temporarily repaired by using silver solder to build up the socket (lamp holder) and to fasten on new leads. Kliegl Brothers replaced all of the sockets after they were notified of the complaints concerning the instruments.

The screws throughout the instruments began to strip, and larger holes were drilled and tapped for new screws. In fact, in one instrument, the bolt size increased from an 8-32 all the way up to a 3/8-16 because it continued to strip out at each new size of screw installed.

The C-clamps on the instruments had lightweight cast iron castings, and they had only 3/8 inch bolts. The threads stripped off of the bolts and clamps alike, and eventually two clamps were broken. The clamps have now been replaced with a heavier weight cast iron casting with 1/2 inch bolts, and they have caused no trouble since replacement.

The lead-in wires were covered with fibreglass sleeves which caused irritation to the technicians' arms when handling. The new sockets mounted in the instruments have their lead-in wires covered with asbestos, and this annoyance has been eliminated.

These instruments would probably be excellent lighting instruments in a permanent installation, but they do not stay in alignment satisfactorily on tour.

In 1971, it was decided to purchase two new lighting instruments each year and to put them to a test before purchasing a large quantity of instruments. Two Century ellipsoidal spotlights<sup>15</sup> were purchased for use on the first light batten. The instruments purchased were an incandescent type with 6x6 lenses. After the lenses were changed and a double flatted reflector was installed in one instrument, they both served very well. The only complaint with these instruments is that they utilize lightweight shutters which warp from heat and occasionally jam.

The policy of purchasing two instruments each year was discontinued in 1972, but if opportunities exist in the future, such a policy should be reinstated. Vanguard's present lighting instruments are showing the wear of touring, and the policy of testing prospective equipment before making a large purchase should be continued.

Macy's of Kansas City donated all of their window display instruments to the University of Missouri-Kansas City Playhouse. Of this display equipment, Vanguard received twelve six-inch fresnel spotlights. These instruments had a medium pre-focus base. Most of the bases were cut up enough that the lamps would not remain in proper conjunction to the reflectors. New sockets were purchased

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<sup>15</sup>Century Strand Inc., of Clifton, New Jersey.

and installed, and these instruments have been completely rebuilt and aligned. They function well for first pipe lighting equipment.

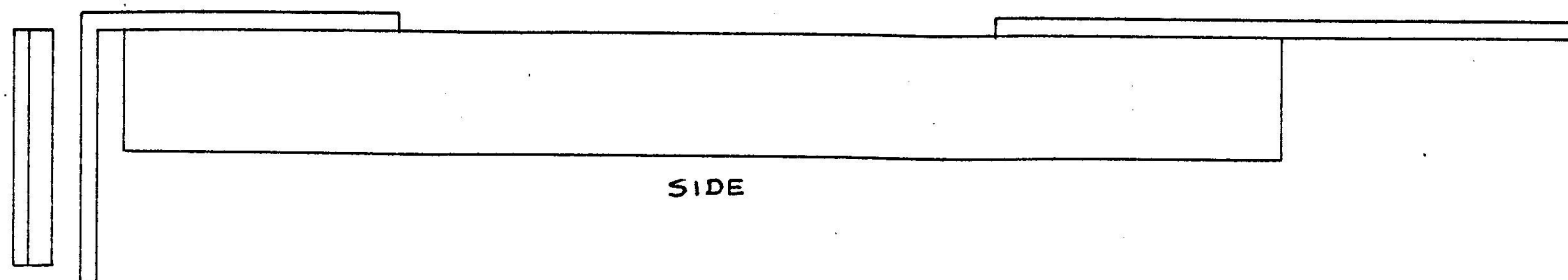
#### Back Lighting

The back lighting has not changed perceptibly since the beginning of Missouri Vanguard Theatre. Floor flanges are fastened to the back of the flats. Short extension pipes are screwed into the flanges, and the instruments are mounted on these pipes. Fresnel spotlights and clip-on-type R-40's were used for three years, but in 1970, six Steberlite<sup>16</sup> lamp holders were purchased by Vanguard, and they were adapted so that they were easily mounted and dismantled. Some renovations were made in these holders this year (1972), and it is no longer necessary to use hand tools to mount these lamp holders on their pipes. The locking bolts were removed from the lamp holders and replaced by bolts with wing nuts brazed on the end so that they only need to be tightened by hand. The holders slide into slots, and they are locked in place with a 1/2" threaded pipe coupling that has a bolt brazed to its side. The holders are tightened by hand. The next improvement that could be made in the lamp holder mounting would be to weld an angle to the end of the pipe closest to the flat and to slide it into a female picture-hook-type apparatus. (See Figures #14 and #15.) The lamp holders will handle up to 300 watt R-type lamps, and in the smaller wattage lamps it is possible to purchase lens holders that easily make possible the use of color media.

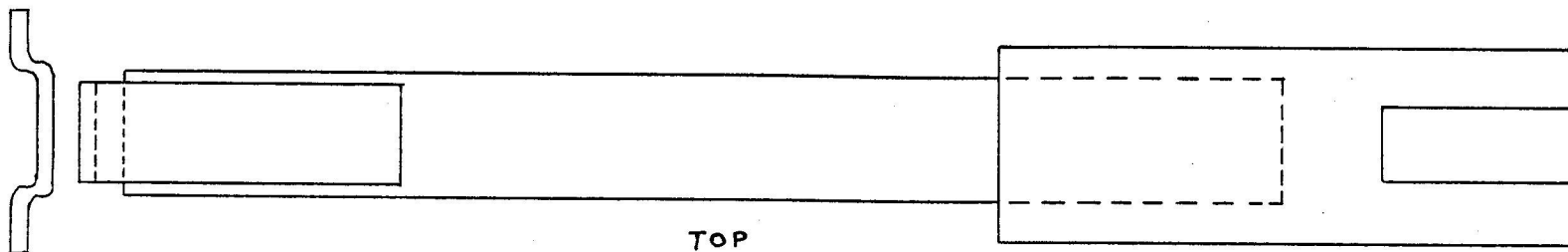
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<sup>16</sup>Steber Lighting Co. of Broadview, Illinois.





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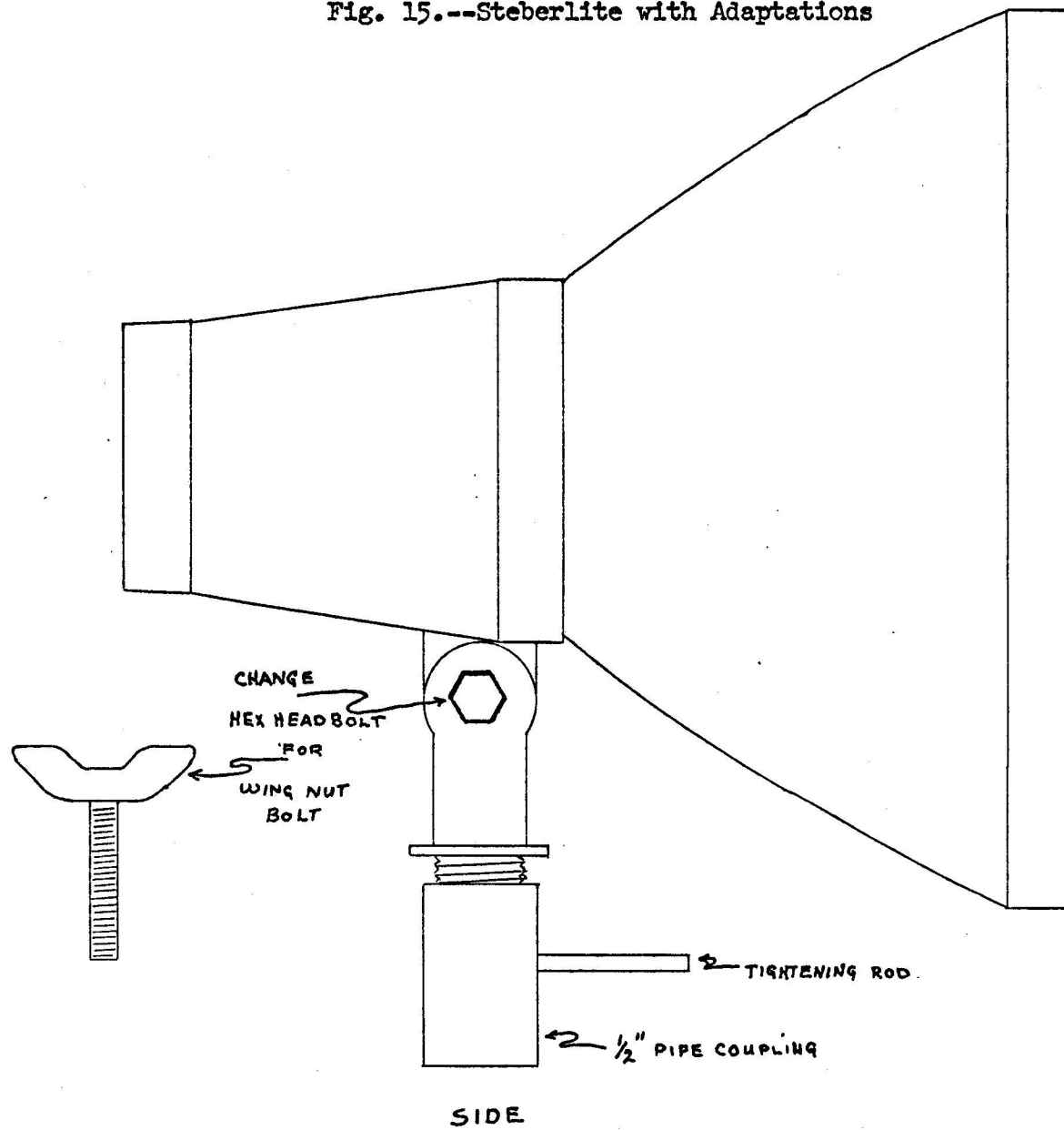


TOP

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Fig. 14.--Mounting Bracket for Steberlite

Fig. 15.--Steberlite with Adaptations



Occasionally, low lighting trees have been used for back light mounting positions, but they have been avoided whenever possible because they would be extra articles in the truck. One year, back lighting trees were utilized in a dual role by also serving as jack braces for the upstage masking flats.

#### Cable

With the exception of the power cable, all of the cable used the first year of tour was rented. The rental agreement stipulated that the cable could be cut in long lengths only, and any short lengths would have to be purchased. Obviously, short lengths of cable were required for two-way connectors and for short jumper cables. Vanguard technicians made the mistake of not purchasing at least 250 feet of cable just to be cut into short lengths. If this purchase had been made, they would have saved half the cost of the cable that was cut into short lengths. All of the cable rented was 12-2 type S which is an excellent type and size of cable. However, it did not serve Vanguard's purposes well on either the legged or the hanging batten because of its excessive weight.

No connectors were supplied with either the rented lighting instruments or with the cable, and pin connectors were rented so that the cables could be plugged into the dimmer boards. The other connectors purchased were three-wire, parallel-blade type. Frequently, the parallel-blade connectors were accidentally disconnected, even when an electrician's knot was used. This type of connector was purchased because it was the most inexpensive type available, and at

the same time it was the type required by the plugging strip batten that had been purchased.

Since the first year, more than 2,500 feet of cable has been purchased by Vanguard, with most of it being 14-2 type SJ, and the remainder of it being a flat type 12-2. All of the connectors have now been standardized and are two-in, twenty-ampere, twist-lock connectors. Numerous adapters are carried by Vanguard in the event that equipment in particular theatres might need to be made adaptable to Vanguard's lighting system (two-pin twist to three-pin twist, two-pin twist to pin, two-pin twist to parallel blade, all of them both ways, male to female or female to male).

Of the 2,500 feet of cable that Vanguard has purchased, there are bundles of three cables (one #12/2 and two #14/2) taped together to connect the lighting equipment on the out-front trees to the dimming equipment. One bundle is 100 feet long and the other is 50 feet long, and both of these feed into a second bundle of cable that is 25 feet long that connects to the dimmers. The first-pipe cable is made up each year to meet the demands of the lighting design, but the bundle of cable that comes from the batten to the dimmers is usually left together. The remainder of the cable is of varying lengths. The 500 feet of cable purchased this year was cut into 100-foot lengths and 50-foot lengths only. Vanguard also carries two dozen two-way connectors of varying lengths for parallel plugging.

Batten hooks are used liberally to keep cables off the floor whenever cables are run for back lights. They are also very useful in keeping extra long lengths of cable coiled neatly off the floor. Sound cable is also strung on the batten hooks.

## CHAPTER VII

### SOUND EQUIPMENT AND TECHNICAL PRODUCTION

#### Equipment

The sound system used by Vanguard is not elaborate, but it has proven to be adequate in most respects. The system was purchased for the first Vanguard tour. It has withstood the rigors of touring for four years, and it is presently in its fifth.

Part of the sound equipment consists of a Bogen fifty-watt power amplifier and two 12" speakers, each with 100 feet of cable and appropriate hook-up plugs. The speakers become a split-type carrying case for the amplifier and cables. The amplifier has a single channel, and the only possible way found to get one sound cue to override another is to use one auxiliary jack and one microphone jack. This causes a certain amount of interference, but for short cues it is practical to use it this way.

Two portable Wollensak tape recorders (model #5730) are used by Vanguard, and they have held up well. The tape recorders are four-track stereo, recording and playback.

#### Storage

All of the sound equipment is carried in a separate, castered box with removable doors that slide into the side of the box to become tables for the two tape recorders and the amplifier. The

present box is the second one constructed for the sound equipment. The first sound box was not made to carry two tape recorders. The present box has shelves for the tape recorders. The shelves are deep enough that they accomodate all tapes, splicing equipment, spare parts and work lights. There is a ten-inch plugging strip mounted on the top of the box so that only one extension cord is required to get power to all of the sound equipment and to the operator's work lights.

## CHAPTER VIII

### PORTAGE AND TECHNICAL PRODUCTION

#### Truck Size

All of the vehicles Vanguard has used have been rented. To date, Vanguard has rented a fourteen-, a sixteen- and three eighteen-foot vans for carrying scenery and equipment. Each year the selected truck has been adequate because the scenery and equipment have been designed, constructed and purchased to fit into the particular chosen truck.

Vanguard is prevented from renting a twenty-foot truck for a number of reasons. A longer truck would cause problems when trying to reach the loading doors of particular theatres because of the limited space in which to maneuver the truck. The high school at Paris and the Loretto Hilton Theatre in St. Louis have driveways that cause problems when an eighteen-foot truck is used. A larger truck would weigh more and would be higher than an eighteen-foot truck. Some of the rural Missouri bridges which Vanguard must cross either have load limits which would be exceeded or low clearances that would prevent a larger truck from using them.

#### Loading

The storage of scenery and equipment in the truck has improved since the first year of Vanguard. The time it takes to load-in and



to load-out has become much faster. The first year of Vanguard there was only a single castered dolly used in the entire loading method. Vanguard now has expanded to the point that there is little that does not move on casters. During the first year of Vanguard, when every item was carried by hand, load-in time took approximately thirty-five minutes. Today, utilizing the dollies, the load-in takes about ten minutes.

Vanguard has found a general method of loading the truck that suits its particular situation. The scenery for the two evening programs is stored on opposite sides of the truck. The school program articles, along with the lighting and sound equipment, are kept accessible near the door of the truck because they must be readily available for the school programs.

#### Scenery and Equipment Storage

The lighting instruments are carried in compartmented, castered boxes, and the dimmer board is carried in a castered box that also serves as a table to support the dimming equipment during performance. The sound equipment is stored in a castered box. The flats are in flat dollies which make it easy to unload a complete set of flats at one time. There are two dollies made particularly to carry properties boxes, cable boxes, fabric boxes, spare parts boxes, etc., which are stacked four boxes high on each dolly. Step units, as mentioned earlier, are stored in castered boxes like other elements of scenery and properties. There is one small, all-purpose dolly that is often used to carry sandbags, jack braces, trim pieces, and unusual-shaped

units of scenery. Vanguard uses both costume bags and costume boxes, and whenever there is enough room in the truck to carry both, the costumes are stored in bags inside the boxes along with the wig boxes and shoes. The costume boxes also are castered, and they are tipped over on their backs and rooled into the dressing rooms. Furniture is also stored in a castered box so that it does not have to be carried piece by piece. Most of the furniture properties are rolled on stage, and then they are assembled.

Vanguard can make no major alterations to the interior of the truck since it is rented. Should Vanguard someday own its own vehicles, there would be the opportunity to customize the interiors to more adequately accomodate the touring equipment.

For the 1968 tour, floor flanges were fastened to the sides and to the floor of the truck, and pipes were threaded into the flanges to make a framework to carry particular objects. Lighting instruments were hung from the pipes. Light battens and trees were stored on top of the pipes. All the other elements of scenery and equipment were tied to the side of the truck or to the pipes with either sash or venetian blind cord. This meant that there were many knots to tie and to untie on every loading session.

It was found after the first year of touring that the use of both elastic cord (bogee) with snap hooks and rubber straps with hooks at each end saved time in securing articles in place in the truck. This eliminate all of the knot tying of the first year, and it saved time in both load-in and load-out. Scenery was put in its proper place and either was snapped to the side of the truck or to

the pipes. Sandbags were packed against the casters on the dollies to lock them into place.

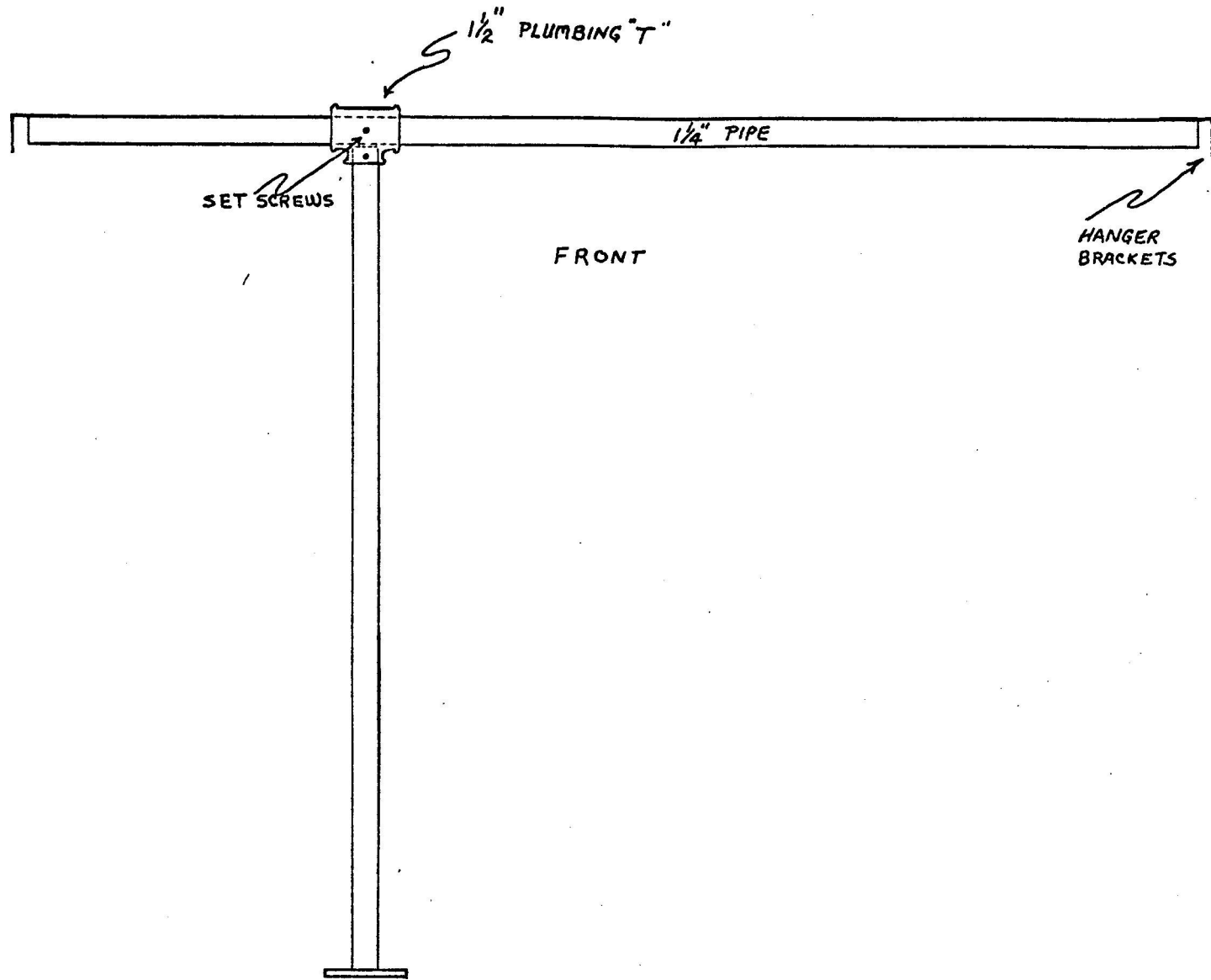
In the second year of Vanguard touring, pipes were borrowed from the truck rental agency in order to carry the objects in the truck. (See the Horizontal Pipe in Figure #16.) In the third year of Vanguard, these pipes were not available, and Vanguard constructed a set of racks from  $1\frac{1}{4}$ " pipe with angled brackets at each end to fasten over the wooden framing on the interior of the truck. During the 1971 tour, these pipes bent under the load they had to support, and they finally gave way, ripping out some of the wooden framing in the truck. Again, 1972, new brackets were fabricated, but they also failed. They were constructed from  $1\frac{1}{2}$ " T-iron, but they bent the first day out on tour; another set of  $1\frac{1}{4}$ " pipe brackets was made, but this time with some vertical support braces added. (See Figure #16.) These braces were adjustable and easily removable. They were mounted on  $1\frac{1}{2}$ " T that slides along the  $1\frac{1}{4}$ " pipe, and they were locked in place with a set screw. The vertical leg was secured to the T in the same fashion, and it was easily removed.

The major condition created by adding so much weight on these support pipes is that the truck becomes top-heavy, and it is difficult to handle at times.

#### Loading Ramp

A ramp was quickly fabricated the first year of Vanguard. It served well enough for three years of touring, but it was considered dangerous for use after the third year. The ramp was twelve feet

Fig. 16.--Truck Support Pipe Rack



long and four feet wide, and it was constructed of 3/4" plywood and cedar 2" x 4"'s. After continued use, the plywood became rough, and the cedar framing began to split. The ramp was unpainted when the Vanguard tour began. The need to paint the ramp surface with a slip preventive sand coat became evident while loading out during a snow storm.

A new ramp was constructed in 1971. Again a plywood top was used, but the framing was made of two-inch thin-wall conduit. The edges of the plywood were to be protected with aluminum angle, but because of the lack of time this was never done. The ramp is now beginning to wear and splinter.

Since the storage room in the truck has been limited, the flats for Vanguard have never been more than 5'-0" wide so that they would fit under the support racks in the truck. Three-dimensional units of scenery are made to break down into smaller units to store since there are only 126 square feet of floor space in an eighteen-foot truck. Items are constructed so that they will stack on top of each other; they are almost always square or rectangular in shape. Irregular-shaped objects consume added space and create a loading problem. Single scenic units should not weigh more than two hundred pounds or the ramp is taxed when the weight of four persons is added. Items stored on top of the pipe rack cannot be longer than fourteen feet or the roll-type door will not open completely. Open-out doors have been requested in the bids for truck rentals, but very few rental agencies have had this type of truck available. Scenery that is to be stored nearest the door of the truck cannot be taller than 6'-10" or the door will not open. This year (1972), a door unit that

previously had been stored at the back of the truck could not be stored in the same place because the truck door was lower than 6'-10"; therefore, the door unit had to be suspended from the support pipes in order to be carried in the truck.

#### Truck Lights

Most buildings where Vanguard performs do not have adequate outside lighting in order to see to load the truck. Lights are tapped into the clearance light circuit of the truck for the lighting required, and with four twelve-volt lamps installed, there is enough illumination in the back of the truck to see while loading. The first year only one light was installed and flashlights were often required. A good type of light to use for illumination in the truck is a backup light like those used on automobiles. They are protected by a case, and, therefore, they are less susceptible to breakage than the exposed lamps in a socket which Vanguard has used for a number of years.

## CHAPTER IX

### TIME ALLOCATION AND TECHNICAL PRODUCTION

#### Design

The amount of time available for the design of scenery and properties depends on a number of variables. The first variable is the date when the repertoire is selected. It generally follows that the earlier the plays are selected, the earlier the designs will be available to begin construction. Another variable pertains to the date the directors are hired and their availability to meet directly with the designer. Frequently, when a telephone conversation or mailed drawings and renderings are not satisfactory to an out-of-town director, a designer must wait for a personal meeting with the director. This delay often means less time for the designer to complete working drawings, and, consequently, fewer days for the technicians to complete construction. In order to ease the pressures of such delays, it might be advisable, at least in extreme cases, to hire the director under the stipulation that he will be working with a pre-designed and pre-cast production.

The first two years of Vanguard it was necessary for the designers to wait until all of the technical questionnaires were returned from the booking communities before beginning designs. The physical limitations were not known by the designers or technicians until the answers to the questionnaires had been received. Since

the designer was dependent on the questionnaire information, he had to delay designing until all of the questionnaires had been returned by the communities. On the basis of the first two touring seasons, it has become practice to design the sets for an optimum width of 28'-0" and an optimum depth of 14'-0". The designs must be executed in such a way as to allow the proscenium opening to be varied from 28'-0" to 20'-0". The stage depth should be made flexible from 14'-0" to a shallow 11'-0".

#### Construction

The original time allotted for the construction of scenery, properties, and costumes, and the organizing of lighting and sound has some bearing on the total technical production of Vanguard. The month of January and three weeks of February usually provide enough time to finish all of the scenery and properties, but important time is lost in shop-hour efficiency if working drawings are not submitted on time. Construction time also suffers when drawings are inadequately laid out.

In both 1971 and 1972 an extra technician had to be hired in order to get the scenery completed on time. The need for the extra technician was necessitated by a number of things, but mainly by the number of pieces of scenery and properties that had to be constructed. 1971 and 1972 were the first two years that two full-length evening performances were offered instead of one full-length play and a reader's theatre offering.



A contributing problem with allocating the time for the construction of scenery and properties is that the allotment of time is set before the play selection is concluded; before the sets and properties are designed; and before the technicians available for construction are hired. It would be far wiser to hire the technical staff and to allocate the time for technical execution based upon the complexity of the designs and the working drawings.

#### Set-Up

The amount of time allotted for crew call for load-out and set-up is an important factor in the physical operation of Vanguard. About one and one-half hours are required for load-in and set-up of the assembly program. This time cannot vary too much because the full hour and one-half is needed mainly for the connecting of the power and setting up the out-front lighting. The quantity of scenery for the assembly program has been limited thus far, and set-up has taken approximately fifteen minutes.

The total length of time required for the completion of the set-up for an evening performance depends to a great extent on the amount of adapting that has to be done to make the scenery and lighting appear at their best.

If the evening program is in the same building and on the same stage as was the assembly program, the set-up time is approximately three and one-half hours. If the evening program is in the same building but on a different stage, then the set-up time is approximately four to four and one-half hours. If the evening program is

in a different building from the assembly program, then the set-up time is about five hours. The power has to be connected and the out-front lighting set up for both an assembly and an evening program, resulting in additional time spent traveling, loading, and setting up.

The asbestos border used on the electric batten is frequently needed for either masking or safety, and hanging it on the first pipe requires about twenty minutes. If the borders present in the theatre have to be raised or lowered for masking, extra time is required before the set is put in place.

The cables to be plugged into instruments on the first electric pipe are labeled for both stage left and stage right operation, but one side of the stage is used more frequently than the other throughout the tour. When it is necessary to shift to the lesser used side of the stage for equipment operation, there is some time lost in plugging since it is not the normal set-up.

Having to put up the legged, portable first light batten requires extra time both in set-up and strike because of the extra carrying, mounting and dismantling. Extra time is required to snap and unsnap this system from the pipe racks in the truck. Carrying and securing time is probably greater than actual set-up time for the system.

The number of power panels that must be removed to reach the power source also affects the set-up and strike time.

The type of set and the trim on the set have a considerable effect on the set-up time required. Most of the sets have been box

sets; therefore, the type of scenery has not changed much. It is the number of stiffeners and jack braces used and the number of movable parts on the set that changes the set-up time. The simple item of fastening the set together causes the set-up time to vary depending on whether it is lashed together or loose-pinned together. Lashing has proven to be faster for Vanguard.

The quantity and type of fabrics (dress properties) that are used on the set are relevant to the time necessary for a set-up. Usually the fabric has to be ironed for every set-up. The quantity of removable trim that is on a set also extends the set-up time. The sets for both The Subject was Roses and See How They Run had sections of trim at the top that had to be put up with six-foot ladders, and they required about twenty minutes to get in place.

The number of dishes to wash, tea and "liquor" to make, and break-away properties to repair are a few other elements that lengthen set-up. The number of breakdown furniture properties that must be carried and assembled by the technicians and crew is also a time increasing factor.

### Strike

The length of time required for striking the scenery, properties, and lighting equipment also affects the physical operation of Vanguard. If the strike and load-out were to take much longer than it does at present, one and one-half hours maximum, it would be difficult to meet set-up deadlines the following day. If the strike and load-out took longer, the technicians would not get adequate sleep to do their work efficiently the following day. Traveling

after a strike and load-out which was more than one and one-half hours would extend the working day to approximately eighteen hours, and this would be detrimental to the alertness of the truck driver and would increase the danger of a mishap.

## CHAPTER X

### SUGGESTED IMPROVEMENTS IN TECHNICAL PRODUCTION

#### Masking

There have been five different designers for Vanguard, and each designer has created a design with an operable set for touring under the imposed conditions. Probably, the greatest failure of the designs so far has been in overcoming the sightline conditions, which pose special problems. Most often the sightlines are unknown because of the use of portable seating. There are so many difficult sightline problems that it is doubtful that all of them could be solved in design alone. At present, it is almost necessary to use a box type set because of the masking conditions encountered.

A system of free-standing masking would be a desirable unit of equipment for Vanguard. It would solve all of the masking problems presently encountered on tour that cannot be handled adequately with the equipment now in use.

Free-standing masking units are manufactured commercially but their cost has been prohibitive for purchase by Vanguard. The Vanguard technicians have found a method of constructing the metal work for such a unit that would avoid the high cost.

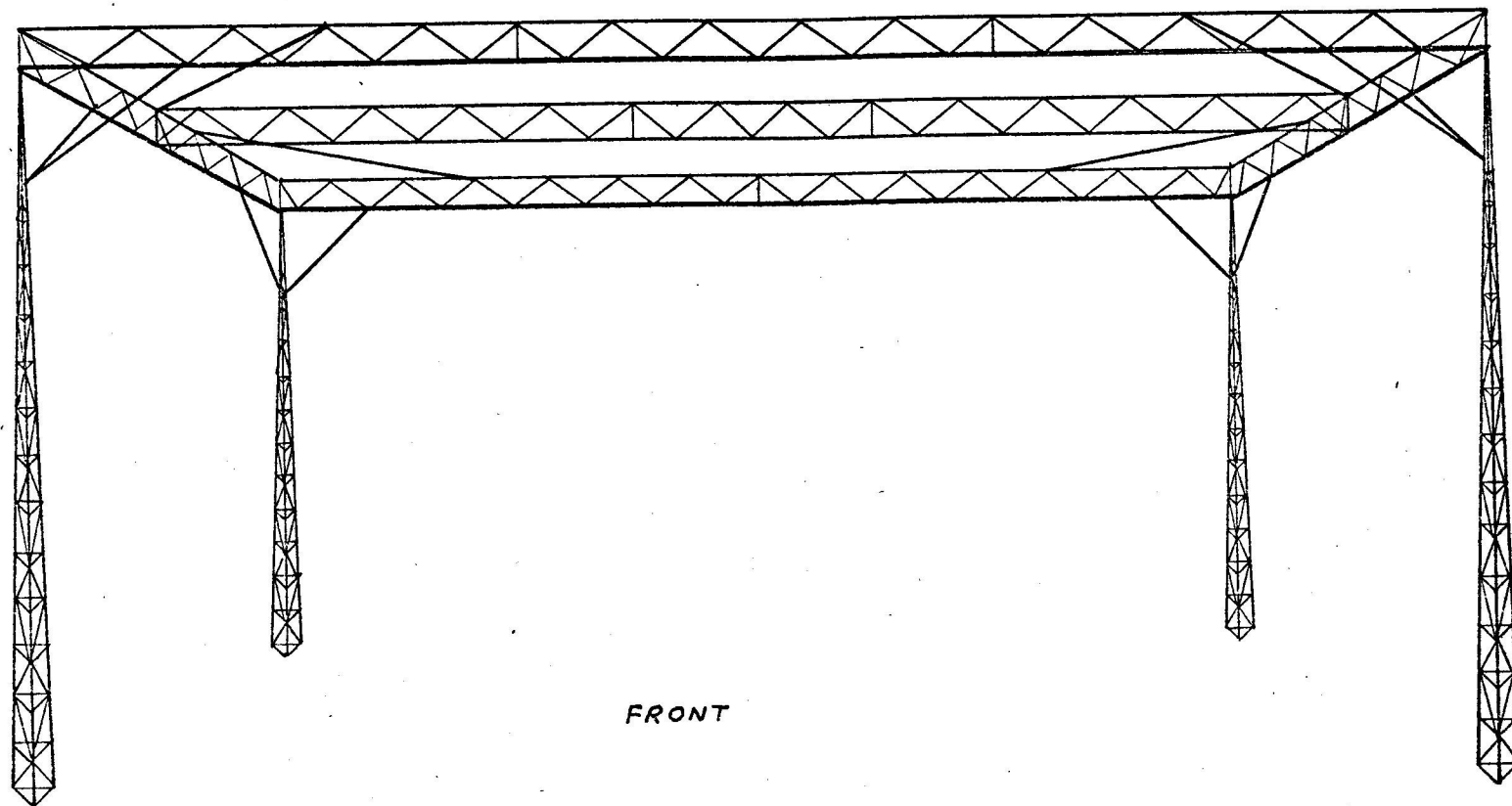
A thirty-foot truss was constructed for the 1972 tour. This truss is made up of two 10-foot sections constructed with 1/2" thin-wall conduit and a third section made from 3/4" thin-wall conduit.

The two 1/2" sections telescope into the 3/4" section. The two 1/2" sections are secured to the 3/4" section by pivot arms that slide over bolts and are held fast by wing nuts. It is possible to use pivot pins instead. If six additional trusses were constructed and four triangular, tapered, telescoping legs were made, the metal work would be complete enough for use by Vanguard. Additional trusses could be fabricated when needed. The entire metal structure would cost about one hundred dollars if the conduit were purchased from a wholesaler. (See Figure #17.)

The purchase of the curtains, legs and borders would involve the major expenditure. Tracks could be welded to different sections of truss so that the curtains could be opened and closed. The present legged first light batten could be eliminated, and the first electric batten could be constructed into the first truss downstage. Vanguard now uses some side lighting but with difficulty. This system would give Vanguard the opportunity to realize the full potential of side lighting. It would also be possible to fly some units of scenery as long as they were tripped and relatively small.

If this system were completed, Missouri Vanguard Theatre could easily set up scenically in any structure or space where they would have to perform. At present, programs are often presented on gymnasium floors, and a free-standing masking system would be useful on such an area. If this system were constructed, the style of scenery could be changed from realistic to more suggestive or impressionistic.

Fig. 17.--Free-Standing Masking Metal Work



### Lighting

It would also be beneficial to make some improvements in the lighting equipment. A larger capacity dimmer board would be an excellent purchase, and since the Vanguard technicians already prefer the Scrimmer, one of the new models (SYS-2-2-12) which has twelve dimmers at 2,000 watts per dimmer would be a good choice. The difference in the wattage capacity of the present Scrimmer and this model is 6,000 watts, and the difference in amperage required per hot leg is twenty amperes.

One negative factor concerning the purchase of the new light board is that many of the buildings where Vanguard performs cannot supply 100 amperes per hot leg in a three wire system, and the higher wattage capacity of the board could not be used. However, there are several advantages. A larger dimmer board would eliminate the use of the five household dimmers that have caused oscillation to occur in the present Scrimmer board. It would eliminate the difficulty of the current mode of operation which requires many hands to operate all of the dimmers simultaneously. The gain would be primarily in smoother light cue execution.

A power problem would be created but if Vanguard would purchase some 8-inch, 1000 watt, ellipsoidal instruments for lighting from out front, then it would be possible to achieve better lighting on stage from the out-front positions. The lighting trees could be placed behind the audience instead of beside them. The lighting angles would be better.



Vanguard should investigate the new lighting instruments now being handled by a local theatrical supply house<sup>17</sup>, sold under the name of the Atcon Pinspot. This instrument is rated eighty-four percent efficient in illumination as opposed to the present lighting instruments Vanguard has that are rated fifty-two percent efficient in illumination. These 150 watt instruments could be substituted for some of the 500 watt instruments that are now used on the first light batten. The substitutions would make the required power available for the suggested 1,000 watt ellipsoidal instruments in the out-front positions.

When funds are available, the purchase of 100 feet of some #2-3 elevator cable would be an advisable investment since Vanguard is presently reaching the maximum amperage rating of its present power cable.

It also might be a wise investment for Vanguard to purchase some #10-5 cable for the trees out front. This would make a neater cable run across the auditorium floor. It would increase the wattage capacity for the out-front lighting instruments. It would also eliminate the power overloads on the #14-2 cable that is presently being used. Two of the wires in the #10-5 could be twisted together to increase the neutral capacity, and the other three wires could be used as the hot leads. This would also eliminate the sagging cable and the two-way connectors that are secured to the trees, for the connectors would be mounted in a box, and the

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<sup>17</sup>Associated Theatrical Contractors of Kansas City, Missouri.

only cables showing would be the main cable (#10-5) and the instrument pigtails.

#### Additional Technician

If another person were hired for the complete construction and touring period, it would be an aid in improving both the technical efficiency and the technical quality of Vanguard. If this person were a qualified properties carpenter with an overall background in technical theatre, it would help immensely. The construction of properties is beginning to be more complex and more time consuming than scenery construction. At present, the furniture properties look unprofessional because of the lack of good planning and the lack of sufficient time to construct them properly. Once a qualified properties carpenter were hired, it would be possible to fabricate durable, quality properties.

#### Trucks

This person would be especially valuable on tour if the technical budget would allow for the purchase of an econoline van to carry the scenery and equipment for the school programs. This van and an extra technical person would solve many of the problems in loading the large truck, and it also would solve some of the problems of setting up for performances in different buildings.

If Vanguard were to purchase an eighteen-foot, furniture-type van, they would gain 250 cubic feet of storage in the truck. This type of van is two feet lower to the ground than a regular van, and it would facilitate easier loading. The additional height in the

furniture van would permit a different type of storage. Scenic elements could be in fewer pieces, and this would save time in both set-up and strike. The doors of a furniture van swing out, and this would save space in the truck as opposed to the roll-type door that has been in all of the trucks Vanguard has rented thus far.

With an increase in technical man-power, equipment and trucking, Missouri Vanguard Theatre could easily expand its school programs to coincide with its philosophy of "theatre for people of all ages."

## APPENDIX A

### THUMBNAIL SKETCH OF AN AVERAGE TECHNICAL DAY

The following is a sketch of an average work day for the Vanguard technicians. By average is meant that the travel distance is thirty miles or less from a motel to the community where all of the programs for that day are to be held. The programs offered for the day are an assembly program, four classroom programs, a grade school program, and an evening performance. The grade school program is staged at a different location from the assembly and the classroom programs. The assembly and evening program are held in the same building on the same stage.

- 7:00 a.m. The technicians and the stage managers rise.
- 7:45 a.m. The technicians and the stage managers eat breakfast.
- 9:00 a.m. After checking out of the motel, the technicians and an assistant stage manager depart for the community in the truck.
- 10:00 a.m. They arrive at the school, and the assistant stage manager checks in with the school contact to notify him of Vanguard's presence and to check on crews. The technicians check the stage conditions and the loading door. If the arrival at the school is too early for crew call, then the technicians and the assistant stage

manager wait for crew call time over a cup of coffee.

11:30 a.m. The truck is backed up to the loading door, and the technicians and the stage managers meet the crews and the crew chief. The load-in begins with the technicians directing the load-in from the truck and assisting in carrying scenery and equipment to the stage area. The assistant stage manager directs the placement of scenery, properties, lighting equipment and sound equipment on stage. The stage manager checks the dressing rooms and sets up the costume rack and handles the hanging and organizing of the costumes.

11:45 a.m. The load-in is complete, and the assistant technical director starts setting up the out-front lighting or whatever lighting is necessary for beam position lighting. The technical director connects the main power to the light boards, and sets up the dimming equipment. The assistant stage manager supervises his crew in setting up scenery for the assembly program first. Once this set-up is completed he then moves on to setting up the scenery and properties that are needed for the classroom programs.

12:15 p.m. If there are no obstacles to a normal set-up of the assembly program and there is time left before the program is to begin, the first light batten is hung by the technical director, and the assistant technical director begins, with crew help, to fasten the stiffeners and the jack braces

onto the flats for the evening program. The stage manager directs a few crew members in ironing costumes and fabric dress properties.

12:50 p.m. The assembly program begins and lasts for about fifty minutes. Crew members are allowed to watch the performance since the technicians and stage managers are usually able to handle all of the equipment operation without assistance.

2:00 p.m. The scenery for the assembly program is struck and loaded into the truck. Then, in preparation for the evening performance, the masking is checked and adjusted as needed. As the borders are being trimmed for masking, the instruments are being mounted and cabled on the first light batten by either the assistant technical director or the technical director with crew assistance. Once the curtains are trimmed, the set is mounted and secured together. When the set is up, the door units are installed, and the set is dressed under the supervision of either an assistant stage manager or the stage manager. The backing lights are installed and cabled, and the sound cable is run. The assistant stage manager sets up the properties-box tables, and with assistance from the crew members, he gets the hand properties washed and set up for the performance. The cables are connected to the dimming equipment by either

the technical director or the assistant technical director while the other sets up the sound equipment and checks out the tapes for the evening program. Once the set and properties are on location and a dimmer check is held, the lights are focused. (Occasionally the focusing has to wait until quite late because there is no way to shade the windows in the auditorium.) After the lights are focused everything is given one last check before dinner -- sightlines, properties placement, masking -- and the stage is cleaned to make it safe for the actors.

- 5:30 p.m. The technicians, stage managers and crew go to dinner if set-up has progressed normally.
- 6:30 p.m. The technicians and stage managers return to the theatre at least one hour before curtain time. A sound check, dimmer check, and properties check is taken by the technicians while the stage managers check with the actors to see if everything is satisfactory and to offer assistance to anyone in need. The house opens at the half-hour.
- 7:30 p.m. The performance begins. One technician runs the lighting equipment while the other operates the sound equipment. Two crew members are usually assigned to help during performance, one as the house light operator and the other as the curtain puller.

- 9:30 p.m. The performance lasts approximately two hours.
- 9:45 p.m. The strike begins as soon as the audience has left the house. Either the technical director or his assistant supervises the loading at the truck while the stage manager directs the order that set pieces are taken from the stage.
- 10:30 p.m. The strike and load-out are usually complete in a maximum time of one hour and twenty minutes; this time varies depending upon whether or not the crew is the same as the crew who assisted in set-up. Occasionally the crews change and the strike and load-out take longer because repetitive orders and explanations must be given to get the work done.
- 10:45 p.m. The technicians and stage managers depart from the theatre for the motel after thanking the crews and the local contact for their cooperation and assistance.



## APPENDIX B

### AUTHOR'S NOTES

1. Some of the most pleasant moments for the Vanguard technicians occur while working with the student technical crews. It is pleasant because of their willingness to work and to cooperate with the Vanguard technicians. Most of the student crew members work for Vanguard without pay, and very few of them ever complain. One could expect to hear more complaints from these young people because the work is hard, hurried and spread over at least twelve hours. It is hoped that the students learn something from their work with the Vanguard technicians. Most of the Vanguard technicians concur that they learn a great deal in working with the student crews, particularly in the way of learning of qualities required for leadership.

2. There are instances when the sponsoring members of a booking community make no provisions for crew help for the Vanguard technicians, and there is little that the technicians can do other than to set up and to strike the scenery and lighting by themselves. This seldom happens but when it does, the technicians are nearly exhausted after such a day. When there are crews present, the Vanguard technicians find that a favorable rapport is established if, immediately upon arrival, everyone is introduced on a first-name basis.

If responsibility, without direct supervision, is given to the crew members, showing them that Vanguard is dependent on them, they feel as if they are needed and are doing something worthwhile for a set-up, whereas, if they are treated like beasts of burden and ordered about without reason, they react accordingly, and they seldom show up for the strike that evening.

3. Another good reason for not fabricating or purchasing weighty or bulky units of scenery or equipment is because the responsibility for the student crew members falls upon the sponsoring community. The University of Missouri-Kansas City cannot be held liable for an injury to any of these crew members. In an extreme case, however, a technician might be held liable if someone were injured while fulfilling any of his requests. If Vanguard cannot provide this protection for its employees, then the individual technicians should purchase personal liability insurance in case an accident should occur. It is still best to make and to purchase items that are easily handled and for the technicians to do all of the hazardous work themselves.

4. Mr. J. Morton Walker of the Playhouse faculty at the University of Missouri-Kansas City suggested the method of flat construction to the technical director just prior to the commencement of scenery construction for the 1968 Vanguard season. Mr. Walker indicated that he was not the inventor of this system of flat construction, but that he had used the method for a tour at the University of Minnesota.

5. It was suggested by Harriet Levitt, an actress in the Vanguard company, that Mr. Sterling Ronai be contacted concerning a painting system that he had devised in conjunction with a local theatre group under the direction of Mr. Robert Lewis. Mr. Ronai had devised the paint system using the industrial products that he sold in his business. He willingly came to the University to demonstrate the system, and after the demonstration, he donated his time and equipment and helped to paint the scenery for the first Vanguard tour.

6. Mr. Carl Lindsey of the Engineering Department of the University of Missouri-Kansas City suggested a number of possible methods of construction for the portable, legged light batten before settling on the aluminum truss mounted on scaffold legs. Mr. Lindsey designed the aluminum truss after eliminating a steel truss which the Vanguard technicians indicated would be too heavy to handle. Mr. Lindsey also suggested the scaffold legs and the use of swivel clamps to secure the whole system together.

PLATE I





PLATE II



PLATE III

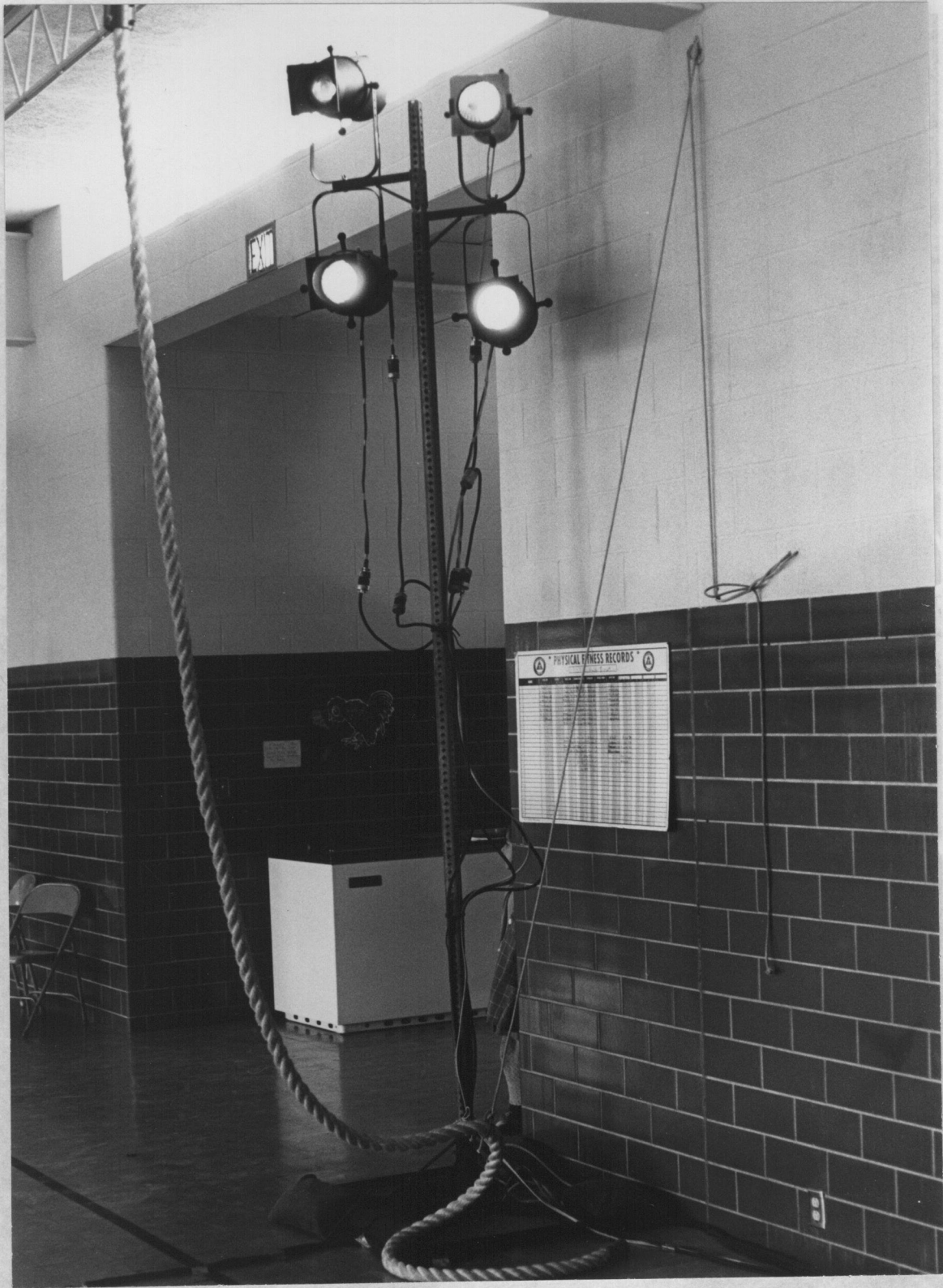




PLATE IV

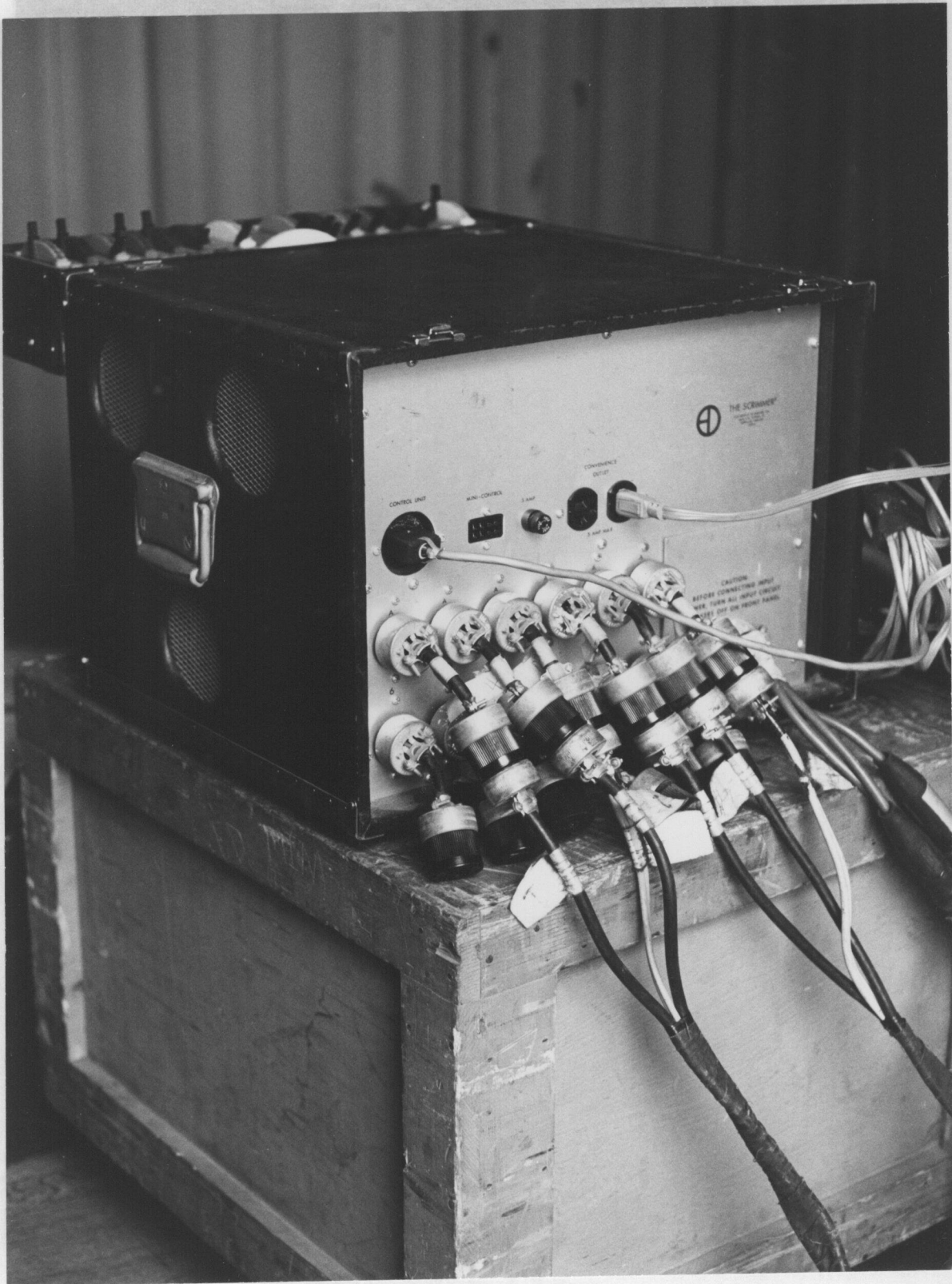


PLATE V





PLATE VI

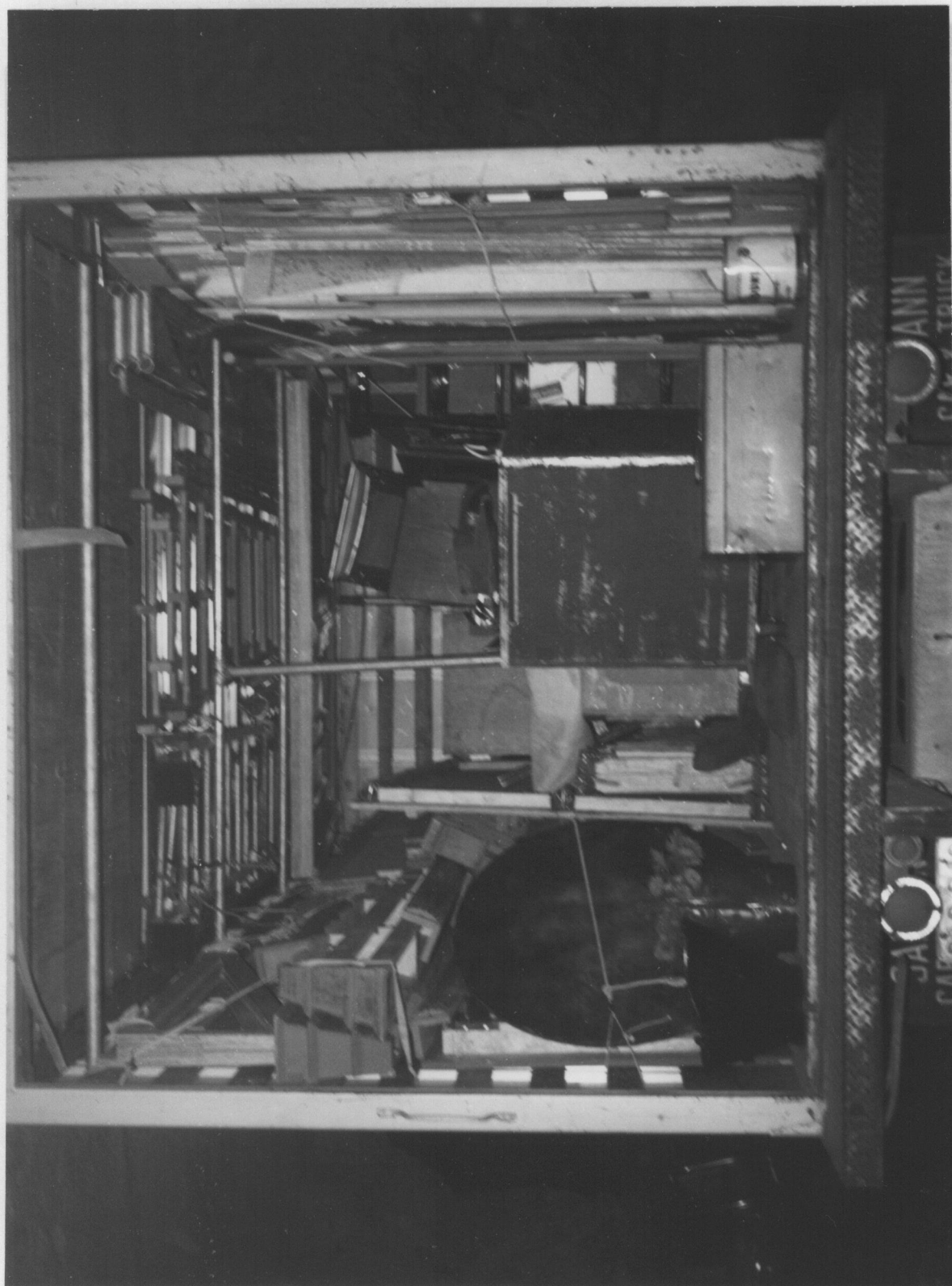


PLATE VII



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VITA

Ronald T. Coles was born in Ithaca, New York on April 17, 1935. He was graduated from Ithaca High School and Cascidilla Preparatory School. He served as an electronics technician in the United States Navy for four years. In 1966, he was graduated summa cum laude from the University of Miami with a Bachelor of Arts in Drama. He is married and has two children.