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

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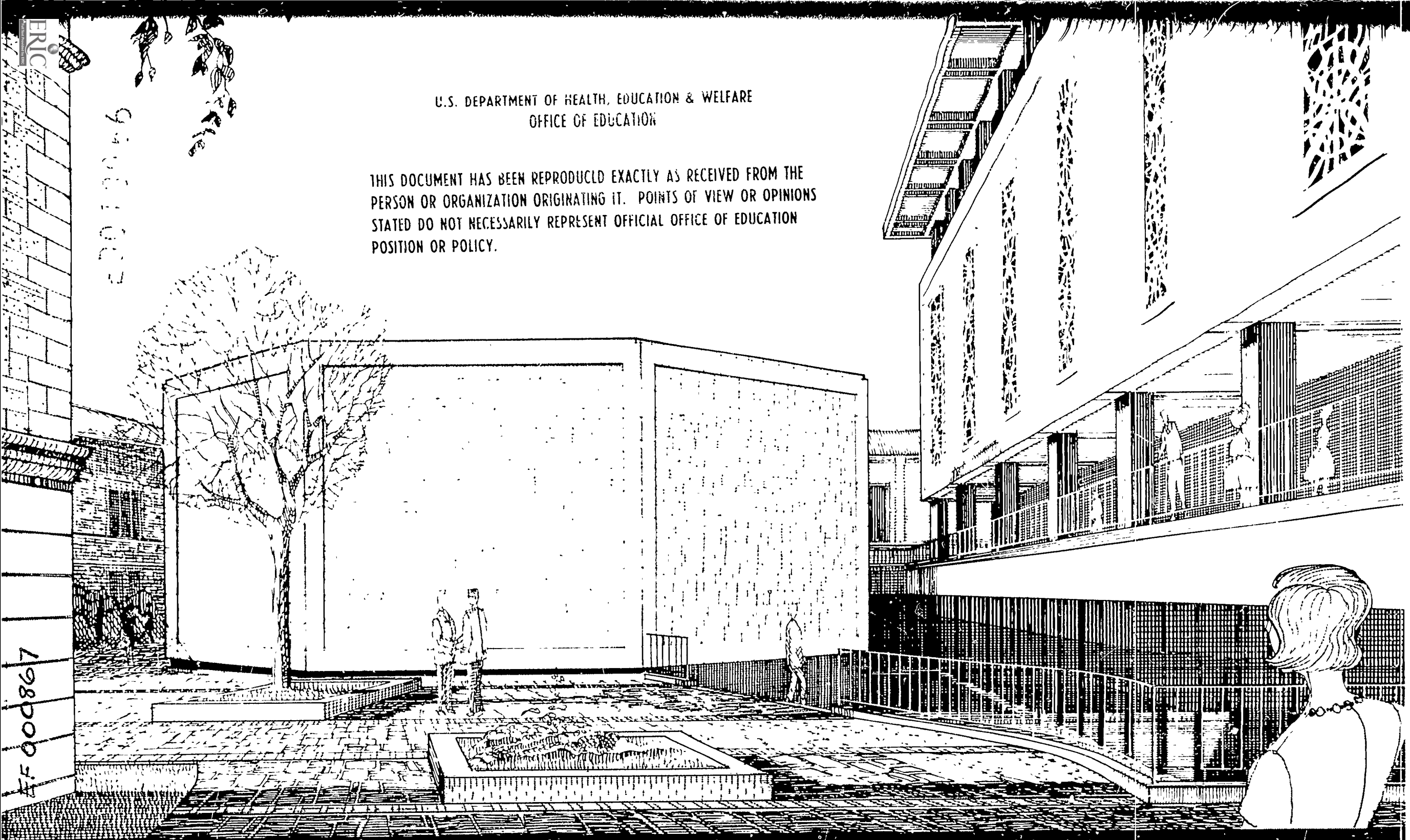
AN AUDITORIUM TEACHING FACILITY.
TEXAS UNIV., AUSTIN

PUB DATE 63

EDRS PRICE MF-$0.25 HC-$0.84 19P.

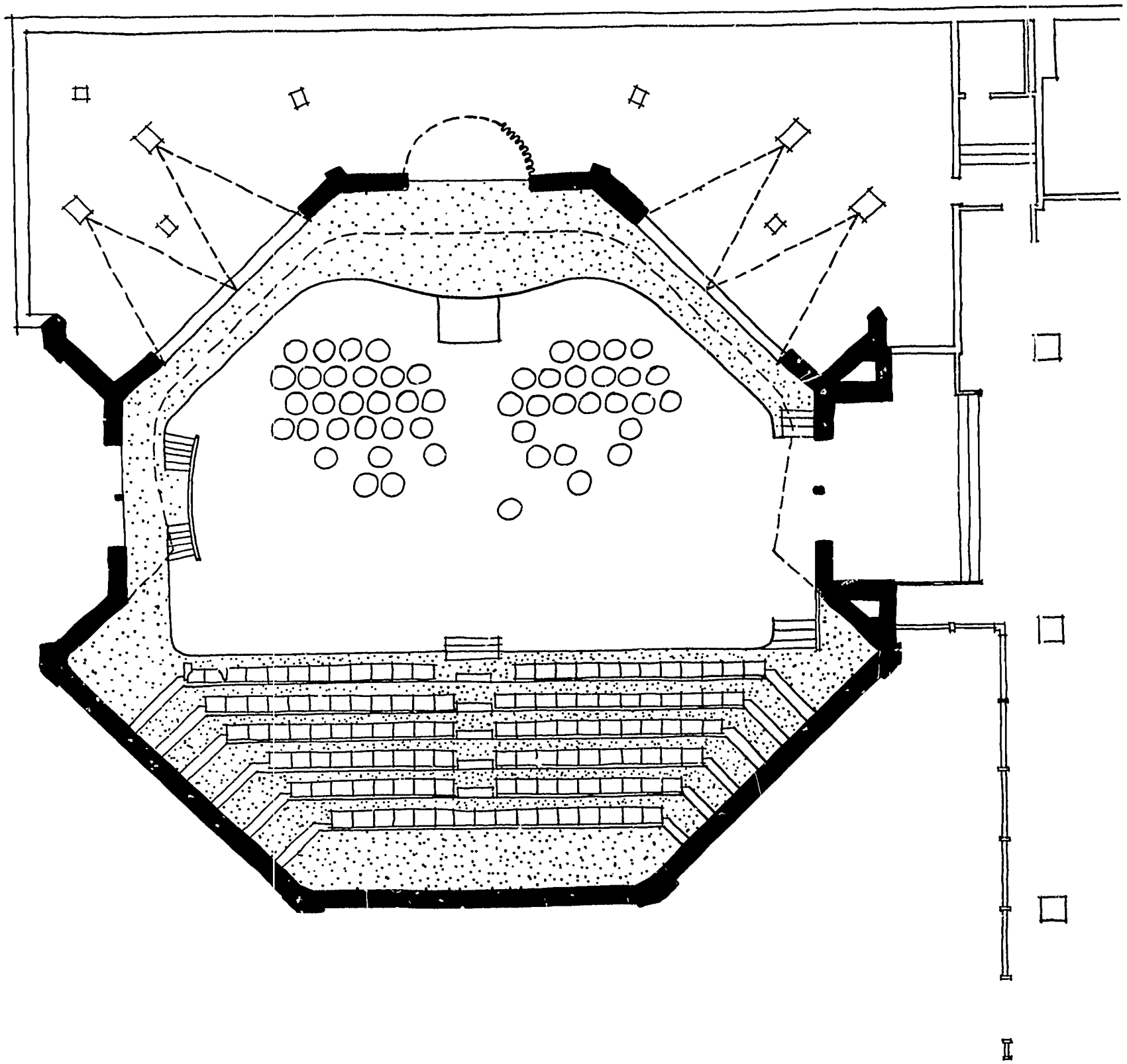
DESCRIPTORS- *AUDITORIUMS, *CLASSROOMS, *FACILITY GUIDELINES, *LARGE GROUP INSTRUCTION, *PROJECTION EQUIPMENT, CENTRAL SOUND SYSTEMS, CLIMATE CONTROL, CLOSED CIRCUIT TELEVISION, EDUCATIONAL SPECIFICATIONS, LIGHTING,

THE AUDITORIUM TEACHING FACILITY DISCUSSED IN THIS BROCHURE IS DESIGNED PRIMARILY TO FILL THE NEED FOR LECTURE FACILITIES FOR GROUPS OF STUDENTS UP TO 300. REQUIREMENTS FOR SUCH A FACILITY ARE LISTED AS LARGE SEATING CAPACITY, EASY ACCESS AND CIRCULATION FOR STUDENTS, MODIFICATION, DIVISIBILITY, AND CONFIGURATION. FLOOR PLANS AND A LIST OF FEATURES OF THE FACILITY ARE PRESENTED. SOME SPECIAL DETAILS DISCUSSED INCLUDE SOUND SYSTEM, ILLUMINATION, ACOUSTIC TREATMENT, AIR CONDITIONING CONTROLS AND CLOSED CIRCUIT TELEVISION. (HH)



AN AUDITORIUM TEACHING FACILITY

THE UNIVERSITY OF TEXAS · AUSTIN, TEXAS · 1963



Participants in Planning

THE THOUGHTS of many people are incorporated in this structure which attempts to give physical expression to the best in instruction for large groups. Among them are:

CO BERT-LOWREY-HESS-BOUDREAUX, *Architects,* who served as special consultants on conception and design;

TELEPROMTER CORPORATION, *Integrated Audio-Visual Consultants,* who were retained to design and integrate the system of teaching aids;

GEORGE A. DAHL *Architects and Engineers,* University of Texas Associate Architects for the Undergraduate Academic Center;

JESSEN, JESSEN, MILLHOUSE, AND GREEVEN, *Architects,* University of Texas Consulting Architects.

THE INTENSIVE investigation and planning which went into the structure as well as the publication of this brochure were made possible by a grant from EDUCATIONAL FACILITIES LABORATORIES, INCORPORATED. Their consultative assistance was also invaluable.

LITHOGRAPHED BY

THE UNIVERSITY OF TEXAS PRINTING DIVISION

The Opportunity

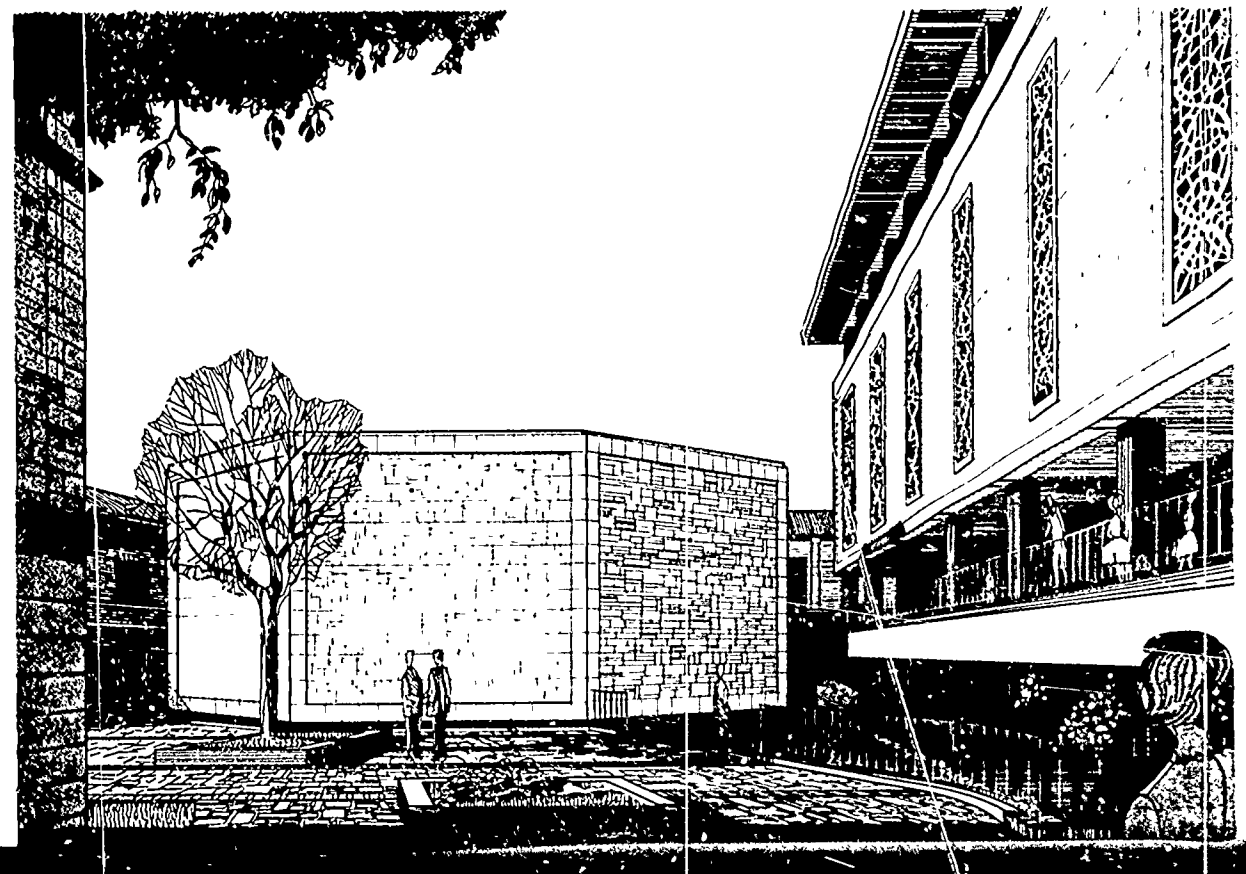
In 1958, the Board of Regents of The University of Texas authorized erection of a new Undergraduate Academic Center in central location on the Main University campus in Austin. Chief unit to be housed was an extensive library and materials collection for undergraduate use. Site studies indicated the feasibility of including a general-use lecture classroom, located within easy walking distance of buildings housing eight major academic departments.

Need for a lecture classroom such as this, capable of being used practically every period of the class week, was great in 1958. That need seems destined to grow sharply as enrollments climb, and as more university-level instruction is performed in auditorium meetings of 150, 200, or 300 students These considerations led to incorporation of a lecture classroom in the plans for the Undergraduate Academic Center.

The Challenge

For a half-century or more, groups of students up to 300 in number will be assembling in this room to learn. Scores of different instructors will be using it. Inevitably, the facilities will be employed for a wide variety of purposes ancillary to instruction—meetings, displays, motion picture and television viewing, and other events.

Can there be designed and executed a physical environment which will, in terms of both current and future possibilities, add maximum effectiveness to what goes on in this room? This was the challenge.



Back of the Challenge

An Educational Concept

Learning is an individual accomplishment. Individual students assembled in large numbers can accomplish much learning. No one knows yet what the ceilings, either qualitative or quantitative, are upon the accomplishments which can occur in such situations. Through experimentation, instructional procedures already known to be effective can be increased in efficiency. New procedures can and should be developed.

The function of an auditorium classroom is to make possible maximum learning by individual students. Hence, it must become an integral and helpful component of a wide variety of teaching processes, some of which are known and some of which are yet to be invented.

Teaching students in large groups is not all of higher education, but neither is it merely a substitute arrangement for more desirable, but impossible, small classes. It is a means for accomplishing with highest efficiency certain types of teaching which can be conducted with unique profit in large-group situations. The goal of large group instruction is effectiveness in learning.

The Owner's Requirements

"This room will be used primarily by professors meeting their regular classes in their regular way," said the owner. "While they will be doing here some sophisticated large-group teaching, some experimentation, and some demonstration, the facility is to be justified by its everyday utility. Specifically, design something that lends itself to the most advanced instructional procedures, but something in which traditional lecturing is very much at home."

Group Sizes. 100 to 300. Classes between 240 and 300 in size lend themselves well to scheduling in an institution of large size with diversity of degree programs and hence with variable demands upon the class-hour commitments of students. It is clear that a facility of this size can be in full use for class purposes. A very large classroom is also needed on the campus, but this site is insufficient for that purpose. Auditoriums seating 500, 800, and 1,200 are already available.

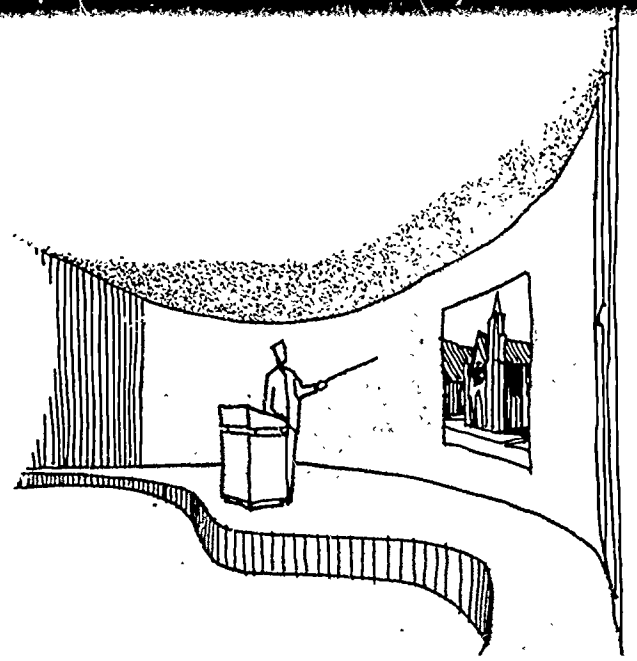
Student Access. Students must move in and out within a 10-minute interval. Orderly arrangement of seating is desirable, with ease of access to each student-station assuming high priority.

Modifability. As groups become smaller (e.g. 150 down), many professors will want to get closer to students, perhaps arranging the seating differently and particularly coming down from an elevated platform.

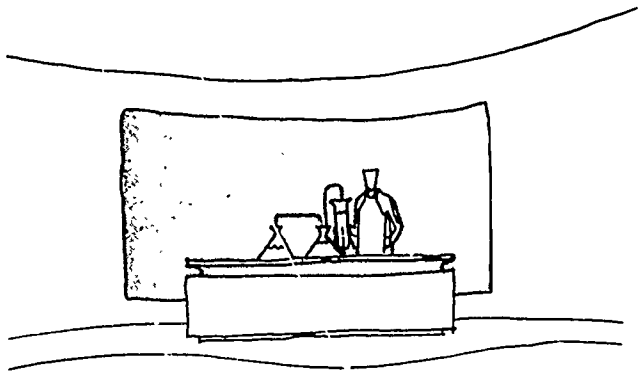
Divisibility. While sub-grouping of students during an auditorium session is desirable occasionally, it does not seem necessary to provide for partitioned divisibility in this particular facility. Other meeting rooms are immediately adjacent.

Configuration. Site and adjoining structure necessitate exterior with circular effect, modest height above grade level.

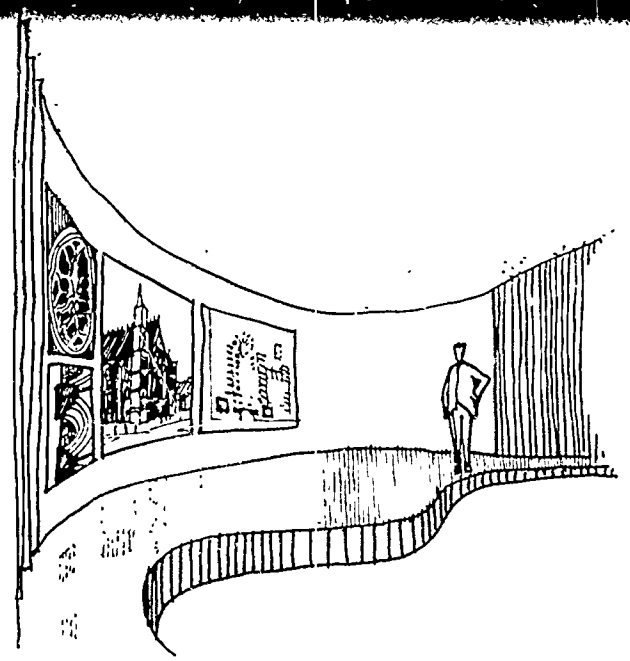
What Will Go On?



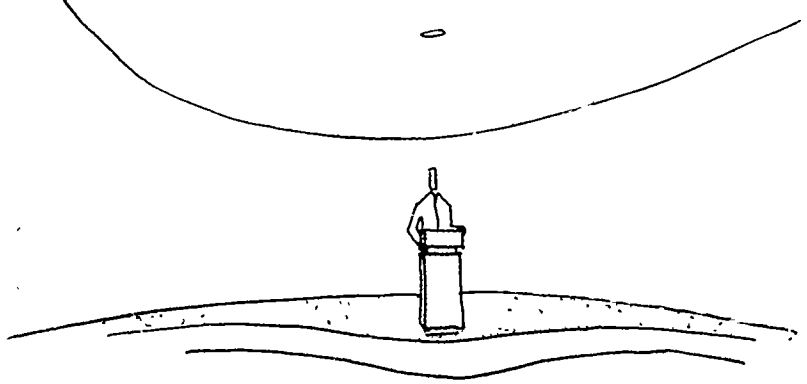
AIDED LECTURE



DEMONSTRATIONS

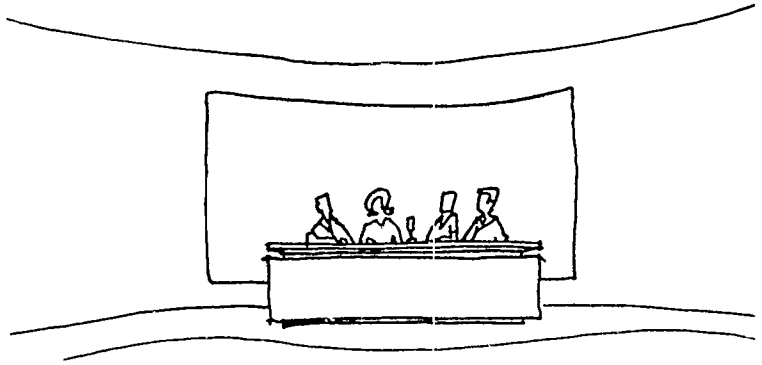


PROGRAMMED LECTURE

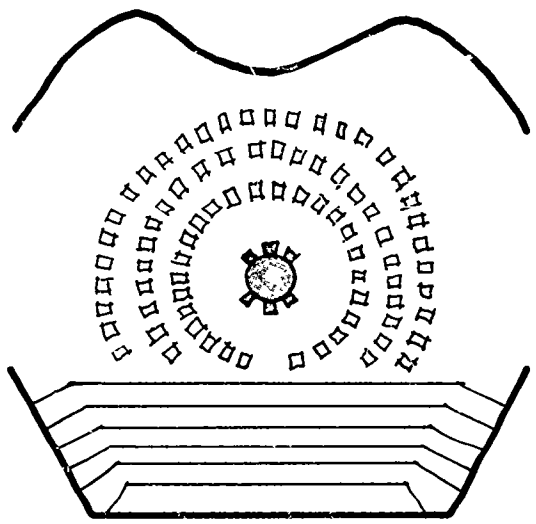


DISCURSIVE LECTURE

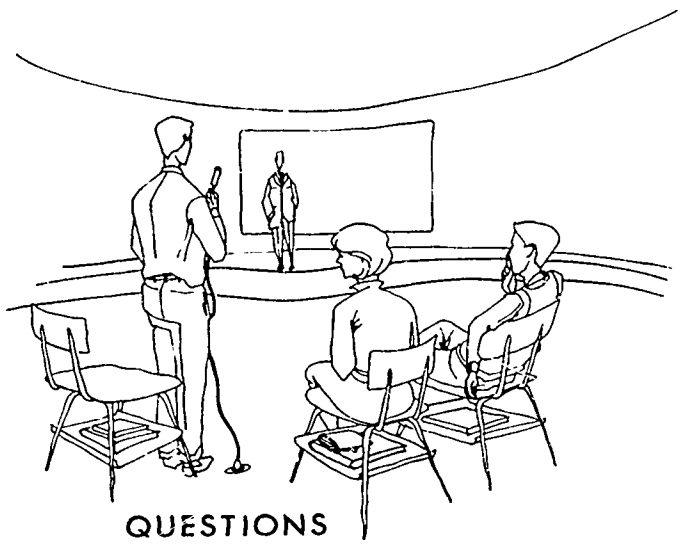
LEARNING



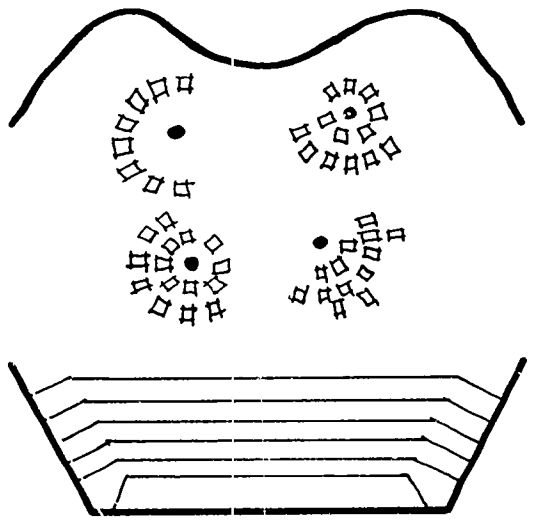
PANEL PRESENTATIONS



LIVE CASE STUDIES



QUESTIONS



REACTION OR FORMULATION GROUPS

What Will Go On?

Aided Lectures. For several years to come, perhaps, the majority use of this facility will be by lecturers who depend chiefly upon verbal presentations supplemented and illustrated by various visual and auditory materials. These materials will range from home-made charts, graphs, and tables to sound tapes and film clips. Some lectures will use a variety of media in a single lecture; most, perhaps, will confine themselves to a single type of aid. Several will want to conduct "live" visual demonstrations.

The budget of the institution for instructional services will probably make it possible to provide almost any type of aid demonstrated to be economically feasible. However, plans should envision operation of the facility with only one full-time technician on duty to service and operate the various devices. He can be supplemented with student projectionists on an hourly basis.

It is essential that the facility provide for employment of the full range of audio and visual devices, predicting as accurately as possible what may become feasible in the future as well as at present. This means especially the incorporation of flexibility to capitalize upon technological advances without expensive structural modifications. It means also that promising, but as yet unproved, installations do not have to be made now so long as the facility has the room and basic services to take advantage of them later. At the same time, the professor who wants to use only a slide projector or an overhead projector should be enabled to do so without going through intricate control panels and complicated arrangements for screens and lighting and assistants.

Programmed Presentations. An increasing number of professors will use this facility for carefully-prepared, highly-automated presentations in which several media, multiple presentation-points, and varied methods are combined into a coordinated teaching act. The facility should provide for optimum exploitation of both present and future possibilities for large-group instruction through multiple media. Yet, simplicity of operational requirements upon the teacher is essential and the demand for operational personnel must be kept within practical limitations upon university budgets.

Unaided Lectures. Many professors will want to use this facility for exclusively verbal presentations. Some will read lectures from a prepared manuscript, others will use notes, and others will speak discursively. Some will stick close to a lectern; others will pace, or seat themselves on a table. Many will want to use a blackboard or some very simple substitute therefor. Voices will vary in quality and volume. For all, to get and hold attention will be important. For many, the "complications" of technical aids are distasteful. The facility should unobtrusively support these lecturers, lend itself to their psychological security, and at the same time assist the individual student in securing maximum benefit from their presentations. Specifically, the impact of sheer intellectual brilliance in verbal presentation must not be impeded by the necessity of using unfamiliar or complicated mechanical devices.

Multiple Lecturing. Panel discussions and symposia presentations will occur with sufficient frequency to warrant spe-

What Will Go On?

cial installations for making them successful. Specifically, it is desired that six persons be able to participate in rapid-fire verbal interchanges without shifting microphones and without becoming entangled in a morass of cables.

Student Activity. Still in its infancy, the art of providing for participatory activity by students in large classes seems destined for rapid development. Samples: (a) Forming discussion or reaction groups, necessitating flexibility in seating arrangements. (b) Comments or answers by individual students, requiring ready access to the public address system. (c) Push-button responses to directions, questions, explanations. Plans should be based upon best available predictions of developments in student participation.

Television Use. Primary requirement is for a self-contained closed-circuit system to be used as a visual aid inside the auditorium. Also, students in the facility should have access to the campus closed-circuit network offerings. Existence of many classroom receiving points for closed-circuit offerings, however, means that this auditorium will be used only occasionally for television viewing. One of the reasons for providing the auditorium is to reduce the load upon the closed-circuit system. Occasionally, it may be desirable to originate closed-circuit telecasts or station broadcasts within this facility, but the existence of complete television studio and videotape reording equipment elsewhere on the campus indicates that such origination would be infrequent.

Ancillary Usage. It is emphasized that this facility is primarily for auditorium teaching. Several ancillary and extended uses are also possible. Various types of public meetings can be housed here, for example. Unusual sound movies can be presented for specialized audiences. Exhibits can be set up. However, the university will have other facilities primarily responsible for meeting such needs; the Auditorium Teaching Facility will perform only supplementary roles. Only when such additional usage can be provided for at modest cost and without deleterious effect upon teaching is it to be planned.

The university does need one small auditorium to accommodate multilingual conferences and assemblies and, if not too expensive, simultaneous translation facilities should be incorporated in the Auditorium Teaching Center. Also, a booth to permit observational discussion of what is transpiring in the auditorium might be helpful in investigations of possibilities for large-group instruction.

Future Advances. It is not expected that this facility will be the last word, nor even necessarily the latest word. It is hoped, however, that it will be one within which a succession of latest words can be incorporated as rapidly as they prove to be valuable and usable additions to the vocabulary of effective teaching on this campus. The test of current utility is to be applied to all initial investments, and planners should have no hesitation in postponing decisions on certain configurations of equipment until lines of technological developments are clarified. The real problem is to leave the future possibilities open-ended while capitalizing upon present potentials.

Exploring the Possibilities

PRESENTATION

One focus or several? Everything can happen in one frame, or different things can happen in different frames, and several centers of interest can exist simultaneously. Multiple focal points add to possibilities for drama, movement, comparative examination, attention-holding variety. They reduce necessity for mechanical contrivances to use the same space for different devices. But, they raise problems in seating arrangements and shape of audience area.

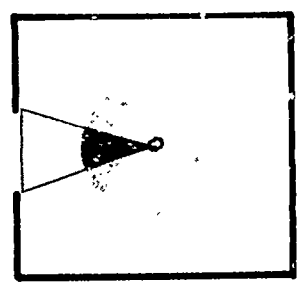
What Media? The lecturer may be circumscribed within a very limited area, or he may be free to move to many points to tell and show. If he moves, how may he be heard?

A team of persons: instructor and students; panels; symposia personnel; instructor and demonstrators; buzz sessions —on the stage or in the round or both?

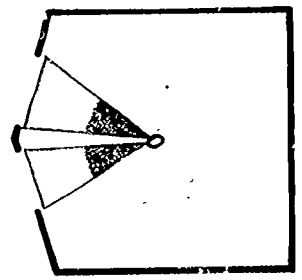
Live demonstrations, magnified or natural, from a stage or in the midst?

Projected sound: Tape recordings, live discussion groups, simultaneous translations, interviews and other case materials —perfection obtainable with complexity, or sacrifices to low cost and simplicity?

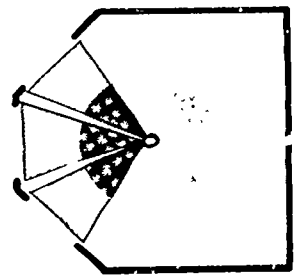
Projected audio-visuals: maps, charts, posters, slides, and transparencies, slide films, opaque materials, animated models, film clips, sound movies, television programs. Often, several of these simultaneously to different viewing points. Can multiplicity be managed within limited space, each medium be readily usable?



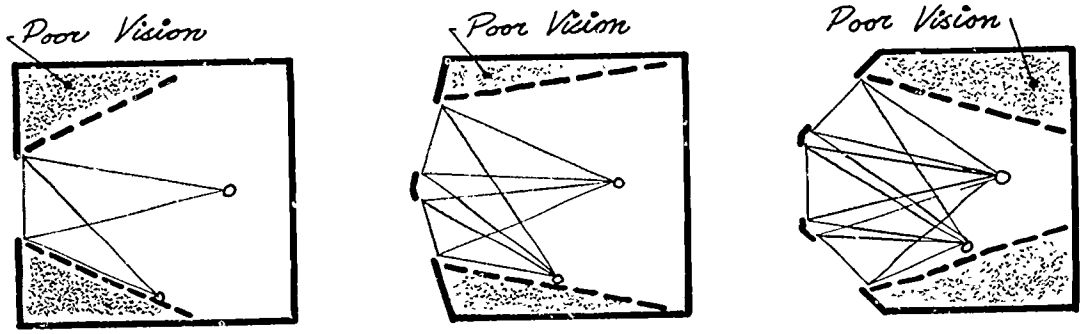
ONE FOCUS



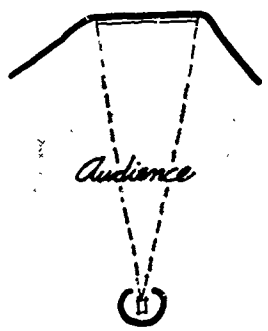
DUAL FOCUS



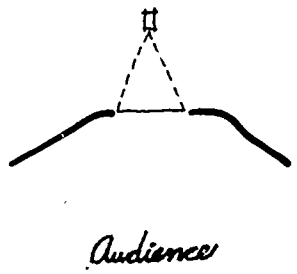
MANY FOCI



SHAPES OF AUDITORITORIUM



FRONT SCREEN PROJECTION



REAR SCREEN PROJECTION

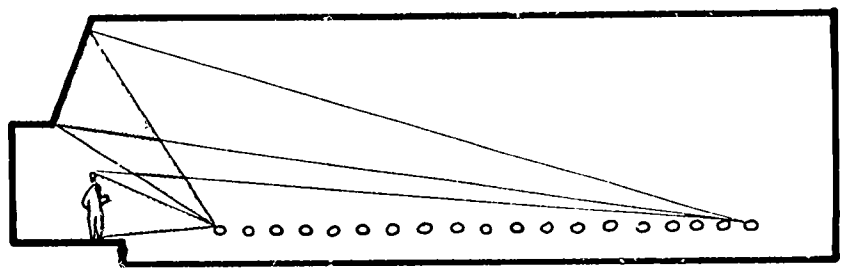
RECEPTION AND PARTICIPATION

The student area. Students must be able to see and hear. Their environment may stress an "audience" mind-set, with a student area of conventional movie-house shape. It may encourage identification and participation by a student area of fan shape, or observation by a semi-circular arena. The floor may be sloped or flat, or a combination of both. Distance between the back-row student and the focus of attention may be great or modest. Formation of small study-discussion groups can be facilitated within cost limitations only by providing some flat floor area and movable seating,

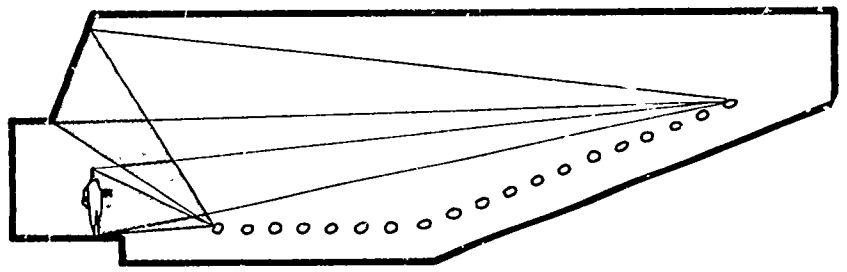
Climate. Physical climate must remain conducive to alertness and comfort in spite of hourly variances in population load. However, the cost of "perfect" climate must be weighed against the disadvantages of tolerable climatic variations.

Emotional climate created by the physical environment should be expansive, optimistic, serious. Mind-sets toward entertainment or stodginess should be avoided.

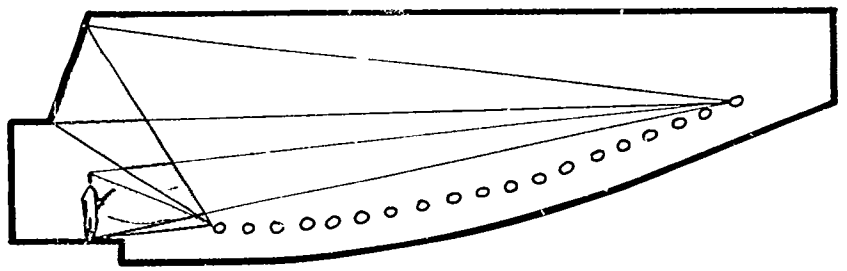
Student Communication. Instructors can secure oral responses and contributions from students by stationary microphone inputs throughout student area; by portable microphones handled by assistants; by a stage-mounted directional microphone; by portable transmitters. Polls or quizzes may be conducted by push-button systems connected to totalizers or visual recorders. Costs of such installations must be weighed against their utility and the existence of satisfactory substitutes.



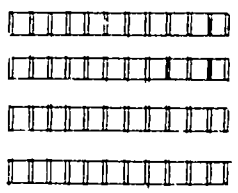
FLOOR FLAT



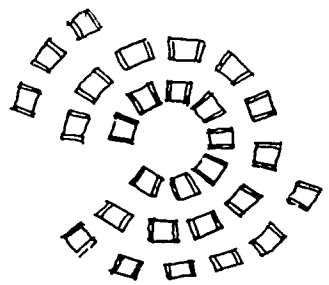
FLOOR HALF AND HALF



FLOOR ELEVATED



FIXED SEATS



MOVABLE SEATS

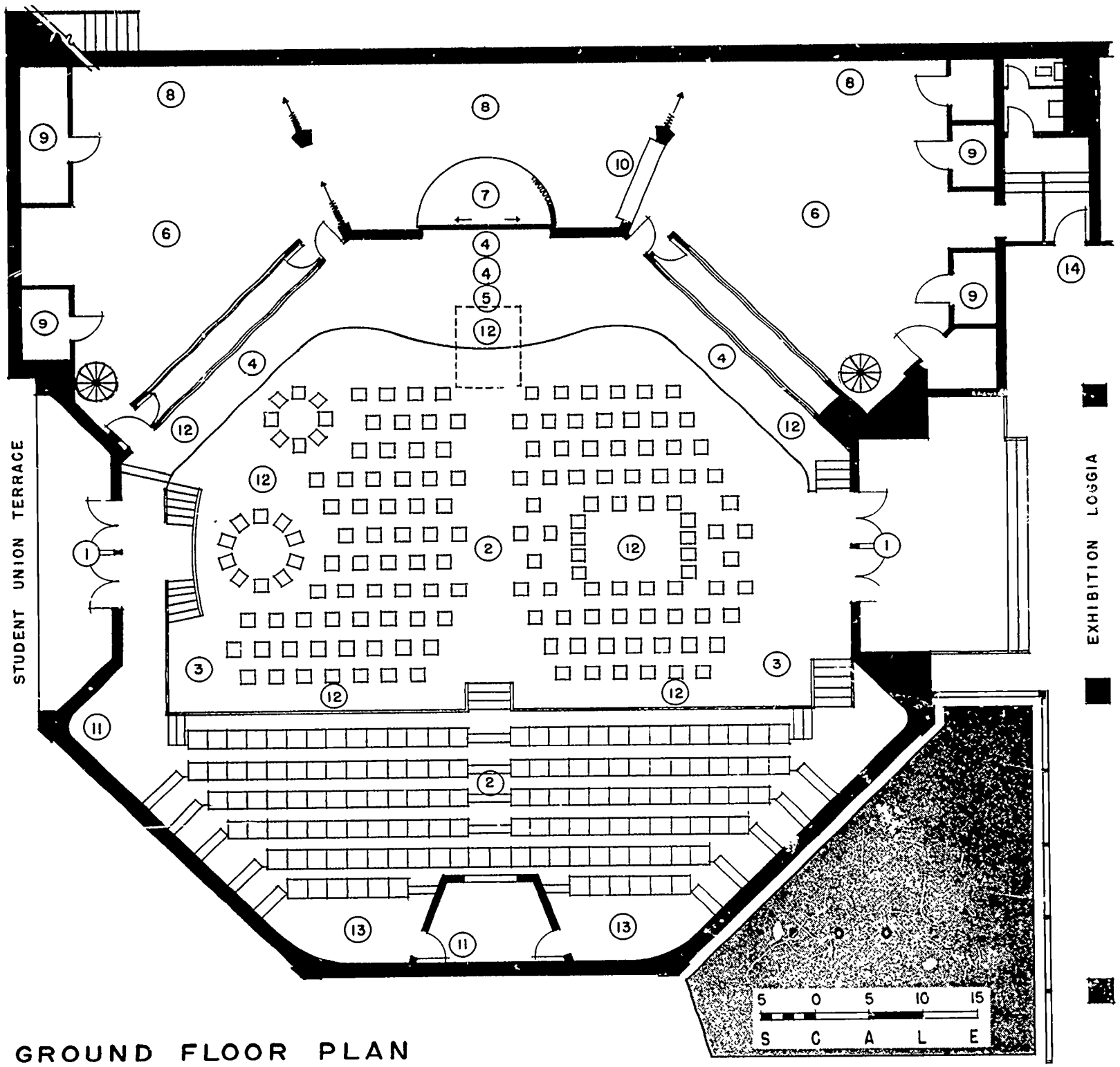
Seating. Accessibility is a key criterion, but it must be balanced against room capacity. Tablet-arms for seats are essential. Use of multiple viewing areas may call for swivel seats, but they add to cost. Advantages of movable seating for subgrouping and for smaller classes must be weighed against such disadvantages as disarray, noise, and custodial requirements. Seating must be comfortable, uncramped, and if possible provide storage space for student belongings.

Lighting. Illumination for note-taking and spot reading is necessary at all times. Standard classroom lighting levels must be obtainable. Glare and other lighting distractions at attention-focus points must be avoided.

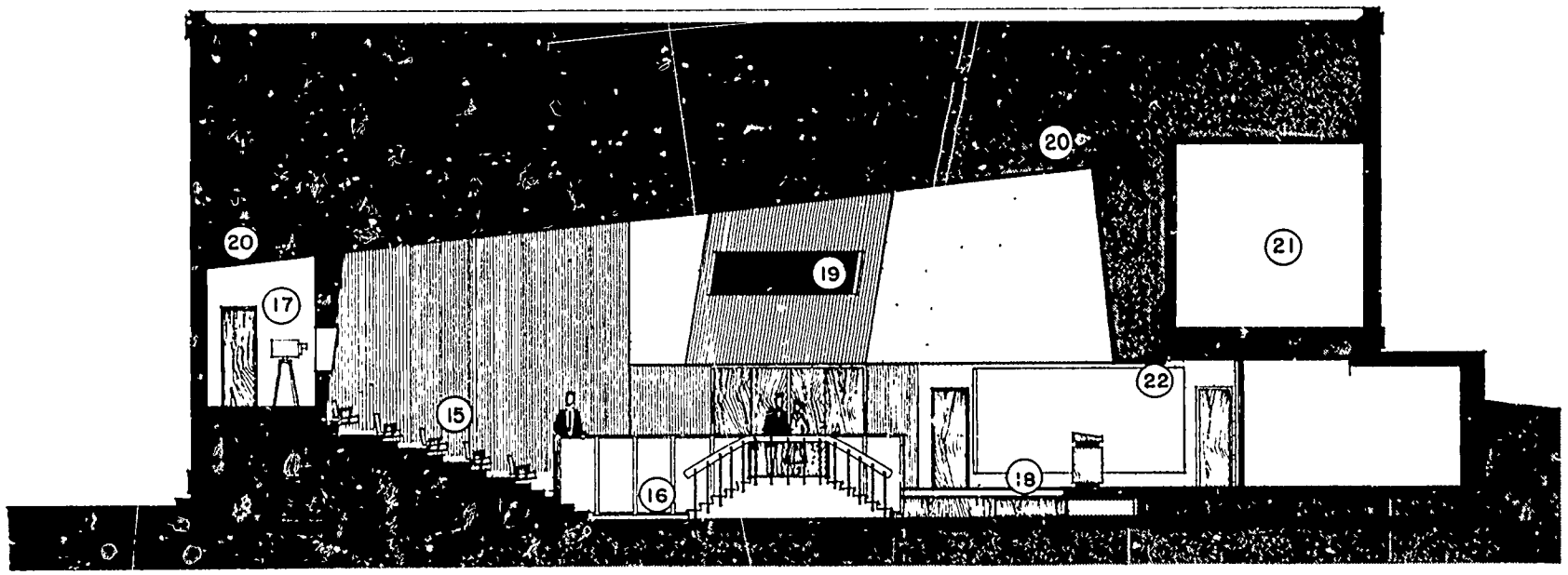
Sound. Distribution of wanted sound should be even and exact throughout the listening area, but this is technologically difficult and costly. Control and diminution of unwanted sound—coughing, chairs scraping, machine operation—is equally important, but the room cannot be dead.

The Facility

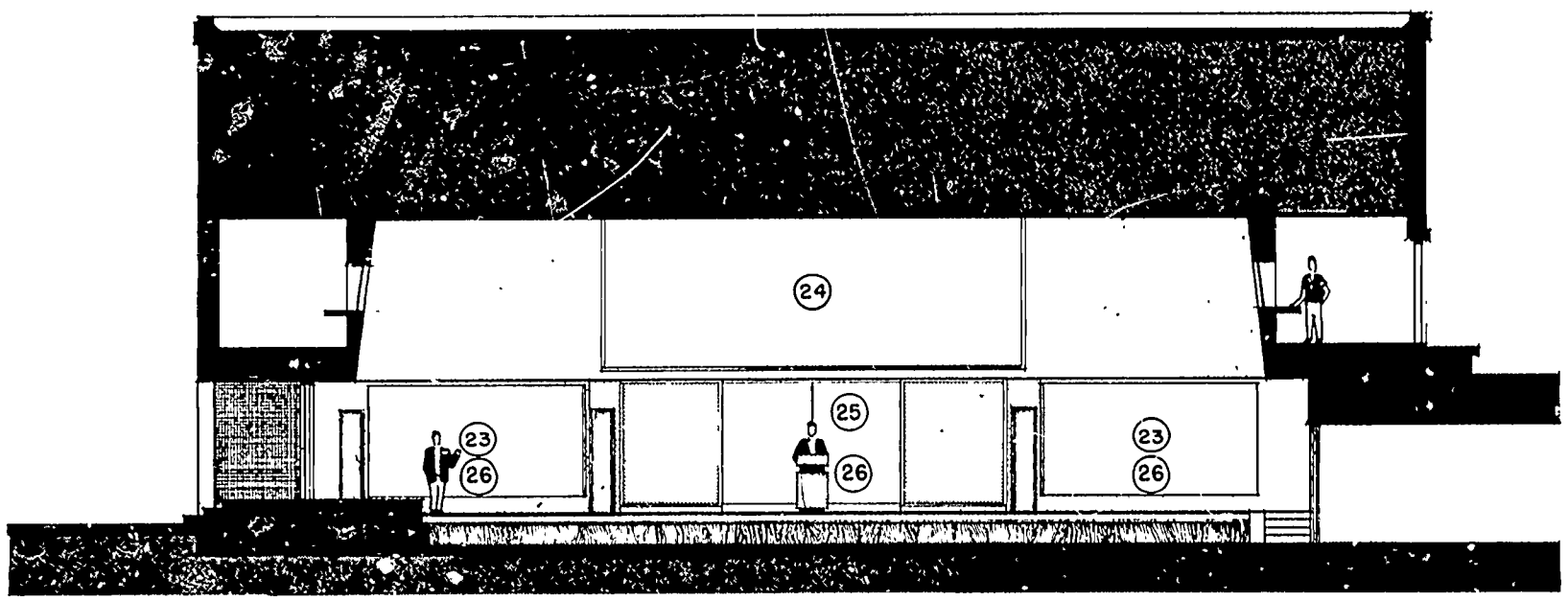
1. Two large entrances at center axis.
2. Student seating area of 2800 square feet; 294 viewing stations.
3. Flat floor of 2040 square feet.
4. Presentation platform, 75 linear feet across 3 sides.
5. Demonstration stage, 10′ by 12′; closed-circuit TV for magnification by rear-screen projection.
6. Multiplexed and single projection areas, rear-screen.
7. Off-stage set up area.
8. Preparation areas.
9. Storage areas.
10. Master control console.
11. Auxiliary control consoles.
12. Lectern and sound in-put locations.
13. Platform for image orthicon TV cameras.
14. Outside access to backstage.



GROUND FLOOR PLAN



LONGITUDINAL SECTION



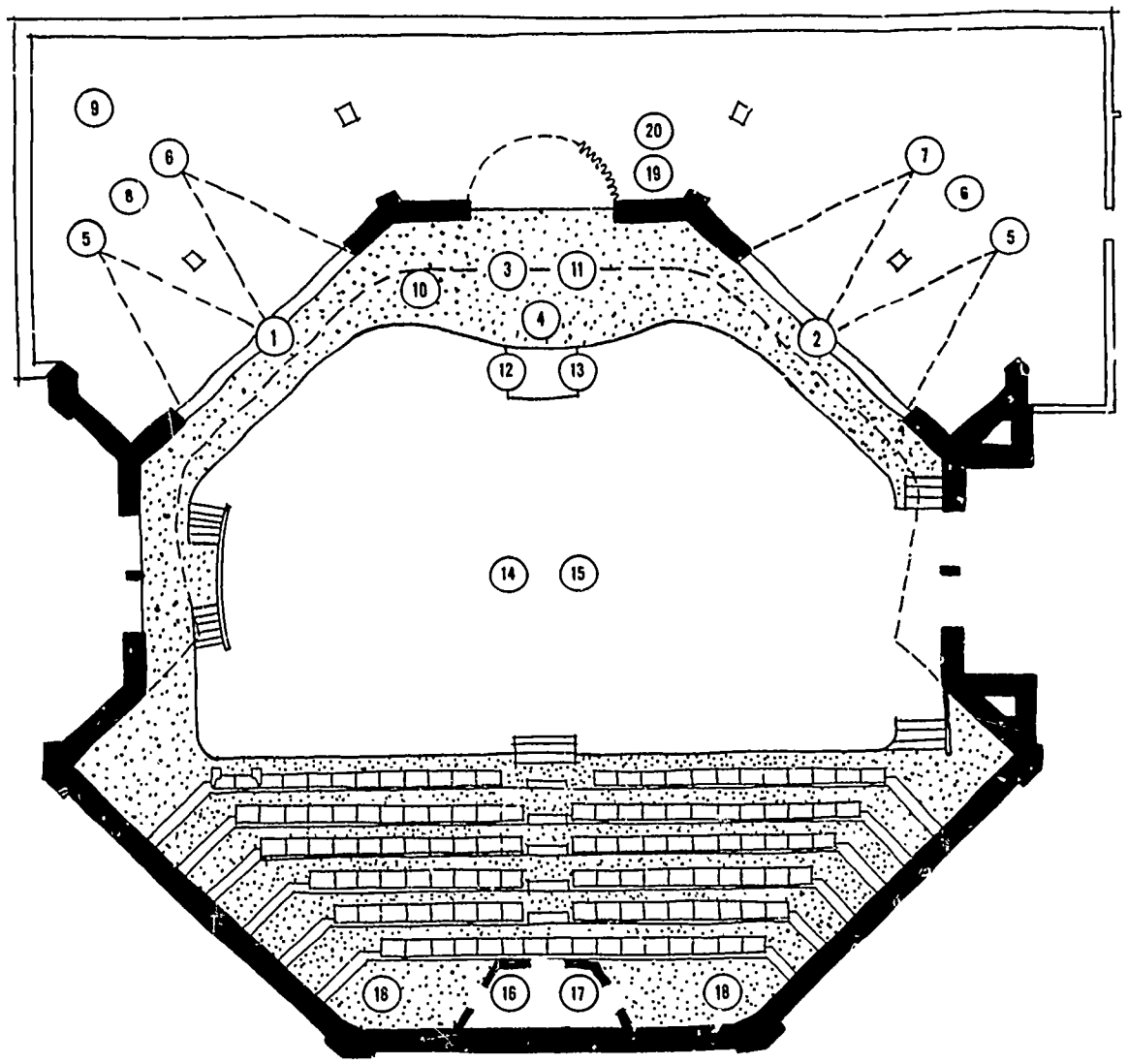
TRANSVERSE SECTION

The Facility

15. 140 opera-type elevated seats.
16. Movable tablet armchair seating.
17. Projection booth for front-screen use.
18. Slide-out podium for overhead projectors.
19. Simultaneous translation booth (observation booth opposite).
20. Ceiling height 12′ to 25′.
21. Mechanical Room.
22. Pull-down screen for floor and podium projection.
23. Two divisible screens for rear-projection (8 simultaneous images possible).
24. Wide-angle screen for front projection.
25. Magnetic chalkboards, sliding.
26. Multiple centers for presentation foci.

Projection Aids

1. Rear Projection Screen, 7½′ vertical, 20′ horizontal, takes two simultaneous images 6′ × 9′, or four 3½′ × 6′.
2. Second Rear Projection Screen.
3. Motorized Retractable Front Projection Screen, 8′ × 8′, tilted or vertical.
4. Over proscenium of presentation area, fixed 12½′ × 28′ front projection screen, for movies and slides from projection booth.
5. Slide Projector, 3¼″ × 4″, 3 kilowatt, remote control, 60-capacity forward sequential slide changer, fixed in rack.
6. Slide Projector, 2″ × 2″, 1.2 kilowatt, remote control, 48-capacity forward and reverse sequential slide changer, fixed in rack.
7. Sound Movie Projector, 16 mm., 1.2 kilowatt, remote controls, 2000′ film capacity, fixed in rack.
8. Television Projector, rear screen. Gives image on screen approximately 6′ × 9′. Fed from vidicon cameras in auditorium; also from campus closed-circuit network.
9. Vidicon Television Camera, 600-line, to pick up images from display panels and racks in preparation area.
10. Roll-on Vidicon Camera, 600-line, fixed prefocus on lecturer possible, remote control. Lecturer has monitor in vision, can adapt presentation to fit camera without operator.
11. Television Demonstration Desk. Self-contained science demonstration facilities; monitor for instructor. Vertical-mounted 600-line camera with microscope attachment, transparency panel. Rolls on and off stage.
12. Overhead Projector for transparencies. Portable. May be mounted on floor or on roll-out platform. Projects to Screen 3.
13. Opaque Projector, portable. Both 12 and 13 are stored in auditorium, are instantly available.
14. Slide Projectors, 2″ × 2″ and 3¼″ × 4″ on table on floor for projection to Screen 3. Not tied to control panel; require operator or remote-control by lecturer.



15. Sound Movie Projector, 16 mm., on table on floor, for traditional use.
16. Slide Projector, 3¼″ × 4″, Arc, manual slide changer; also accepts 2″ × 2″ slides. Projects to Screen 4.
17. Sound Movie Projector, 16 mm. Special lenses and other modifications for professional projection.
18. Mobile image-orthicon television cameras may be mounted here to cover presentation area and feed to campus closed-circuit network, videotape recorder, broadcast. Ancillary lighting and sound pick-up provided for.
19. Tape recorder inputs; also plug-ins for multiple recorders to tape lectures.
20. Master Control and Coordination Center. Control console also mounted in lecterns and remote console can be operated from audience area.

Provision for Projection. Far-reaching was the decision to rely chiefly upon rear-screen projection even for television. Demonstrations convinced owners and architects of requisite quality in images. Rear-screen projection allows greater illumination level for the audience area, reduces interference and distractions by operators, lessens projector "throw", allows lecturer to operate in front of screens. Auditorium can be designed without constant adaptations to projector beams.

Multiple viewing areas were used to introduce drama, enhance teaching opportunities, and provide flexibility. One screen may hold a composite process, for example, while sub-processes unfold on other screens. Changes from slides to opaque materials to films to television-amplified demonstrations are instantaneously possible. At the same time, lecturers preferring only one projection locus can have it.

Careful provisions have been made for coordination of aids. Projection devices may be mixed by the use of multiplexers with a television camera. Or, as many as four devices may be used concurrently without multiplexing. Concentration of devices and control panels makes it possible for one technician to serve all, out of sight of the audience. Control panels permit later addition of complete telemation (program automation) by punched cards or programmed sound tapes. Present control system permits pre-set sequences and can be operated directly by lecturer or by signal from lecturer to technician. Telephone communication from lecturer to operators is provided.

The two side screens are divisible into four viewing areas, each served by its own projector complex. Screens are backed by plate glass panels to eliminate noise penetration from backstage.

Magnification of on-stage demonstrations will be provided by vidicon television cameras feeding a rear-screen projector. Roll-on cameras will be used at present, but stage overhead structure will permit later installation of fixed-mount cameras if desirable. Fixed linkage to the campus closed-circuit television system permits rear-screen projection of programs from that network.

Rapid development of projected television seems to be in prospect. No structural modifications will be necessary to take full advantage of foreseeable advances. During an interim period, pedestal-mounted monitors can be used throughout the student area. For example, movable cameras can feed to students in rapid succession an instructor's writing on the chalkboard, an illustration from a book which he holds, maps mounted in the backstage area, and the lecturer's outline which he handed to the technician as the class began. However, the owner is still concerned with the manpower costs involved in origination of television as compared with costs of recorded aids, and plans to rely chiefly on the latter for the immediate future.

To feed programs from the stage to the campus closed-circuit television network or for broadcast, the University's mobile unit will be used. Platforms for image orthicon cameras are provided at the rear of the auditorium, with adequate cable and power connections.

Many lecturers will want to continue the use of overhead projectors for opaque materials and transparencies. For them a roll-out podium is provided, still giving some elevation above student eye-levels, with a pull-down screen in the center of the stage. The same screen can be used for front projection of film-strips and slides.

For special showings such as wide-screen movies and unusual slides, front projection to a large screen over the stage

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is provided from the rear of the auditorium. Although chief use of this feature will be ancillary to instruction, its modest additional cost justifies its inclusion.

Technological development seems to be in the direction of compact, multipurpose, automatic projection devices. In this installation, the only structurally-fixed elements are the screens and conduit-chases. Large open spaces are provided for projector installations. It is believed, therefore, that the owners can take advantage with maximum economy, of technological advances as they occur. At the same time, existing aids and controls can be exploited fully.

Student seating. Still debatable is the choice of flat-floor seating (instead of arena-type elevation) for two-thirds of the student area. The choice was based partially on cost considerations, but chiefly upon the desire for adaptability to highly-variable teaching procedures. The flat-floor arrangement brings more students close to the instructor and makes a wide presentation area practicable. It adds to ancillary usage of the auditorium. It offers the only feasible solution to the formation of sub-groups within a lecture period, and simplifies traffic problems. Many believe it will be more conducive to a desirable climate for learning. Careful studies of lines of vision and acoustic properties revealed no real deterrents to use of the flat floor.

For this portion of the auditorium, the floor is carpeted and light weight movable tablet arm chairs are used. Standard auditorium seats with tablet arm attachments are used for the elevated seating, with center and side aisles. The ideal of providing each student with independent access to his seat without disturbing another had to be sacrificed to limits upon over-all space.

Whether the movable seating will result in chaotic disarray at the end of each period remains to be seen. An alternative would be installation of fixed-pedestal swivel-type seats, destroying the chief uses for the flat floor. It is hoped that students and custodial staff can be persuaded to protect the advantages of flexible seating.

Sound systems. The unaided human voice will carry from the center of the lecture stage to any point in the auditorium. However, the assumption is that most speakers will use the public address system.

A lecturer may flip a single switch, adjust the volume control, and proceed to lecture without the intervention of technical assistance. Speakers are so located that he cannot produce feed-back from anywhere in the lecture area.

More elaborate uses are provided for. On-stage panel discussions are made possible with a special installation. Two "lecturers" may speak from opposite ends of the stage. Microphones can be plugged in and used from any point in the student area. Comments and directives can be given while audio-visual aids are being employed.

Employment of portable transmitters in lieu of microphones was considered; ceiling-mounted microphone systems to cover the lecture area were also examined. Present maintenance difficulties with such systems led to decision to employ wired microphones, chiefly portable ones. Transmitter equipment can be added easily when desirable.

Speakers for audio-visual aids are mounted contiguous to the screen being used. For the public address system speakers are located to deliver the sound in the entire auditorium simultaneously; distances involved made a synchronization system unnecessary.

Floor outlets in the student seating area provide for earphone connections to any

one of three channels emanating from the simultaneous translation booth. The same conduits have room for later installation of student-response system wiring if desired, and response meters can be installed on the stage.

Illumination. Lighting of the auditorium is provided by ceiling recessed incandescent type fixtures designed to provide adequate illumination for reading and note taking. Illumination levels are controlled through a dimmer board located back stage, and by remote controls at the lecterns and at the projection booth.

Lighting of the stage area is dimmable, with ceiling recessed fixtures with warm-white fluorescent tubes. In the central stage area, high intensity quartz tube fixtures are recessed into the stage ceiling to provide suitable illumination for displaying lecture help materials and for closed-circuit television. Also recessed into the central portion of the stage ceiling are fixtures with ultra-violet fluorescent tubes to provide black light to activate fluorescent chalk messages on the chalkboard. The semi-circular curtained area, immediately back stage, is provided with dimmer controlled fluorescent fixtures and quartz tube fixtures.

Lighting backstage is designed to prevent direct light from falling on the back lighted screens, but provides adequate illumination at the projection equipment, control panels and work areas. Language translation room lighting is provided with its own local dimmer. Power supply, circuitry, and outlets are provided for flood-lighting of stage area for television broadcasts.

Acoustic treatment. Octagonal rooms traditionally exhibit severe focused reflections, continuing echoes, and flutter. These difficulties have been overcome, at drawing board level, by several measures. Floor and ceiling are sharply non-parallel. At least one member of opposite wall surfaces is made highly absorptive and diffusive. Sound diffusion at higher frequencies is provided by batts of glass wool with wood reed coverings. The floor is carpeted. Upholstered fixed seats are used, and the parapet wall is made very absorptive. The reverberation period has been set at the optimum value for speech use, which will also reduce reverberation from chair noise. Air-conditioning sound will reduce distraction-power of small audience noises.

Air Conditioning System. A re-circulation system is supplemented by exhaust fans to take out the most-heated air. Capacities of cooling and heating equipment will take care of maximum loads, but no special provisions are made to handle fluctuations between periods. Meticulous attention is given to maintenance of satisfactory and steady sound-level.

Controls. Integration of all audio-visual devices, illumination features, and intercommunication systems is made possible by a Control Center backstage. A single operator has full override control of all functions. The Center is rack-type, with ample room for expansion of functions. Automation is provided by circuitry built into the Center and is accomplished by simply pressing a button on a control console.

Control consoles are in lecterns which may be placed at variable locations. They are also provided for plug-in at points in the audience area, and a master console is part of the Control Center. A lecturer may communicate by telephone with the operator and have various sequences put in motion. Or, he may assume control himself by pressing labeled buttons on his own control console. If he is using automatic program sequencing, he presses only one

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master button to activate any pre-selected combination of functions. Note, however, that the lecturer who wants to operate manually a slide projector or an overhead projector can still do so. Planners are convinced that the entire presentation system can be serviced and operated by one full-time technician, except that television cameras will require individual operators.

Other Aids. Center backdrop to the presentation stage is a display area for charts, maps, and other large graphics. A magnetic chalkboard may be used, either to write on or as background for appliques. The large overhead screen can carry directions for written work, examination questions, or other material to be seen by students as soon as they come into the room. (Those "please announce to all classes" items, for example).

A demonstration desk or other model material may be set up off-stage during a preceding period and positioned inside the circular screened-off area to be rolled on-stage through the sliding panels when the instructor gives the signal. Preparation areas off-stage give instructors and assistants room to set up class aids while another class is meeting. Liberal storage areas backstage should be of great help also. Facilities for the auditorium technician are compactly located, enabling him to be immediately available to the teacher at almost any point in a class session.

In Service

The facility enters service in September 1963, scheduled for 30 hours per week for regular classes. Additional hours during the class day are reserved for try-out use by professors desiring to explore applications of multiple media to instruction. Other hours are reserved for ancillary uses in connection with the Academic Center, for conferences and small convocations, and special lectures.

Whether the facility can keep pace with the inventiveness of professors and the development of instructional technology will be the real test of its fundamental design. Through the built-in opportunities for continuous modification, it is hoped that this facility will never be dated but always in the process of keeping up with faculty members.

Have the planners incorporated potentials which will not be used? Every feature was selected on the basis of a favorable prognosis for utilization. Testing of these prognoses now begins. The additional capital investment in this attempt to serve professors and students was relatively small. It can and should pay appreciable dividends as exploitation of this facility opens up new avenues for the excellent professor who teaches students in large groups.

Some Statistics

Student Capacity	296
Elevated, Fixed Seats	140
Flat Floor Area	2,500 sq. ft.
Greatest Student-Lecturer Distance	55 ft.
Elevation of Stage	36 in.
Cubage Additional for Projection Aids	18 per cent
Cost of Teaching Equipment alone, installed	$68,000

Copies of this booklet may be obtained by addressing a request to

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