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**International Education and Research**  
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**PORTUGAL UNIVERSITY  
INSTITUTES  
DEVELOPMENT PROJECT**

**(Contract AID/NE-C-1701)**

**REPORT ON  
SHORT-TERM STAFF ASSIGNMENT**

**Submitted by  
PROF. DAVID F. MOSES  
Undergraduate Library Services  
Purdue University**

**June 5 through July 29, 1983**

**and**

**PROF. HORACE S. TYLER  
Agricultural Information  
Purdue University**

**June 5 through June 25, 1983**

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REPORT ON  
SHORT-TERM STAFF ASSIGNMENTS  
AT THE  
INSTITUTO UNIVERSITARIO DE TRAS-OS-MONTES E ALTO DOURO (IUTAD)  
VILA REAL, PORTUGAL

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## ACKNOWLEDGEMENTS

The consulting team appreciates the excellent cooperation and hospitality extended by the administration, faculty, staff and students of IUTAD, the staff of the Regional Agricultural Ministry, and the people of Portugal who made them feel welcome.

Prof. Doutor Fernando Nunes Ferreira Real, Reitor of IUTAD, is especially thanked for his warm hospitality and cooperation which permitted the team to consult freely and openly with the IUTAD staff and students, with staff members of DRTM and personnel of LNETI in Porto about their plans for a continuing education center to serve business and industry management needs.

A special heartfelt thanks goes to Eng.<sup>o</sup> Jose M. de Aguiar Macedo, Head of the Documentation Center at IUTAD, for arranging many interviews and tours which contributed to the information gathering efforts of the team and for the many hours personally spent in being available to answer the many questions which were necessary to write this report.

Appreciation is also expressed to Dr. Jose Torres Pereira for the many arrangements made and the guidance given. Gratitude is also given to Dr. Tom Gunter, Purdue Project Coordinator, for his interest in the team's mission and his participation in the communications workshop and to Mr. Charles Buchanan, Project Manager, AID/Lisbon, for his valuable briefing and exit interviews.

There were many other persons who contributed to the outcome of this project, both from IUTAD and from the Vila Real community, and from farm cooperatives and industry. To these people thanks is extended from the consulting team.

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## PREFACE

"The material assembled by University, special and national libraries is a most important source of national wealth. In the modern world, no productive activity can be carried out successfully unless adequate information can be made quickly available to specialists and research workers. Without the support of such information, which must surmount language barriers and ignore political frontiers, no serious work for economic and social development can be accomplished." (1.)

"...Access to books means access to ideas and the cultivation of the human spirit, and the effect of these on the pattern of life is not immediately apparent. Nevertheless, the growth of a highly organized and technologically based society calls for literate citizens, able to benefit from and respond to the main media of communication. Hence, in the last decade, governments in both industrialized and developing countries have become increasingly concerned with the provision of efficient national and local library services and supporting documentation services." (2.)

The purpose of the visit to the Instituto Universitario de Tras-os-Montes e Alto Douro by Professors Tyler and Moses has been to consult with administration, faculty and staff of the Institute on communications in extension work, preparation of news releases, methods of social communication, printed materials processing and overall philosophy on communications. It was also to evaluate current library and audio-visual services, to develop plans for equipping and staffing a new Teaching/Learning Resource Center (T/LRC) and to prepare concepts for the installation of the T/LRC.

It was apparent to the consulting team that everyone with whom they talked was interested in improved information transfer, be it between teachers and students, researchers and extension workers, administration and staff, or researchers and regional agricultural staff and farmers. It was also evident, once they understood the T/LRC concept, that they would be glad to see enhanced library, audio-visual and printing services

available for their use. This was not necessarily a complaint about current services but a recognition that more services were needed to accomplish their goals.

It is generally thought that most problems can be solved with money and in many cases that is true. However, even money problems can often be solved with a real understanding of the problem by all parties concerned. How often has it been said that if only the other party to the problem could understand, they would give their support? The real problem then in most cases is communications. How do we help others to understand the benefits of our ideas, because, if they did, money would be available or they would try the new idea on their farm or they would see the importance of learning this subject matter. There is such a thing as honest difference of opinion for which no amount of good communication will change a person's mind, but if the communication between parties is really good, these cases would be at least more understandable.

It is with these thoughts in mind that the following information is presented to assist the Administration of IUTAD in the establishment of a Teaching/Learning Resource Center to serve the teaching and research programs of the Institute and the general community assistance program with which IUTAD is involved.

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## IUTAD - TEACHING/LEARNING RESOURCE CENTER - T/LRC

### General Recommendations and Comments

These recommendations are based on information gathered through interviews and observations made by Professor H. Tyler and Professor D. Moses with a representative sample of IUTAD administrative, teaching and research staff, Purdue University staff in International Programs in Agriculture, and others representing the office of the Regional Ministry of Agriculture, local newspaper, LNETI, etc. Reports of previous studies by Allison and Furtado were also reviewed. A list of these resource people may be seen in Appendix H.

1. A Teaching/Learning Resource Center (T/LRC) should be established at IUTAD for the purpose of increasing and enhancing the flow of information at all levels and in all directions by expediting the acquisition, production, cataloging, indexing and accessibility of information in any format.

2. The head of the Teaching/Learning Resource Center should be directly responsible to the Reitor of IUTAD.

Rationale: The T/LRC should be equally responsive to all departments of the University and by priority to other agencies. Any departmental ties to the T/LRC could reduce its effectiveness in serving the needs of the whole University.

3. The T/LRC should serve the teaching, research, extension and administrative needs of the University equally and as the first priority for the efforts of the Center. Other agencies, such as the Regional Services of the Ministry of Agriculture, government offices, the local teacher training institute, farmers, farm cooperatives, etc., will need to be identified specifically and placed in priority order for receiving services directly. It should be noted that when an IUTAD department is cooperating with one of these outside agencies, requests for T/LRC services are then coming from within and become first priority requests.

The Reitor should use whatever body deemed appropriate to assign priorities.

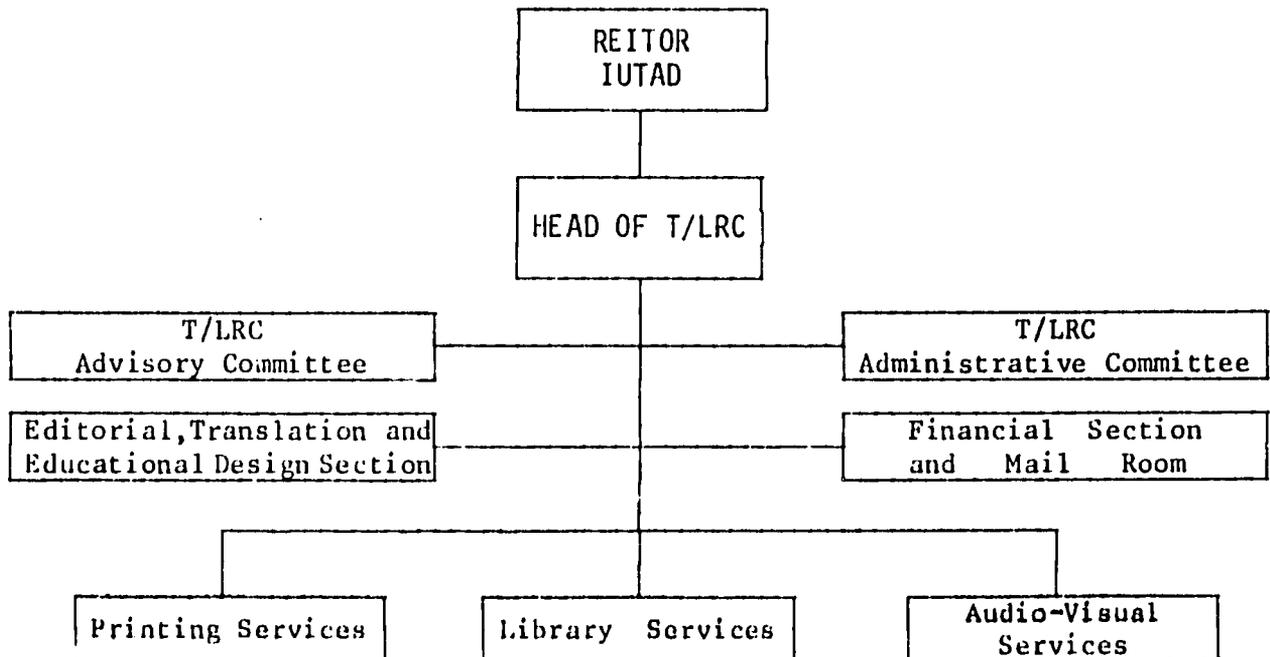
Rationale: It would be desirable if the T/LRC worked only for other University departments and offices. This would ensure that all T/LRC work has the subject matter expertise of the University available on all jobs. The extent of departmental involvement could vary considerably from job to job.

4. The T/LRC should initially consist of four interacting parts: The T/LRC Administrative Office, the Library Services Section, the Audio-Visual Services Section and the Printing Services Section.
5. The parts of the T/LRC should be housed close to one another as they must be highly interactive to reduce costly duplication of facilities and staff.
6. The T/LRC Administrative Office should include in its scope: Promotion of services, editorial, translation, and educational design services for both print and nonprint productions, logging and work flow control, financial and ordering operations, personnel management, and mail room services.
7. The Library Services Section should include in its scope: Acquisitions, cataloging, indexing, catalog information, readers services (reference, reserves, study space, circulation, etc.), interlibrary loan and borrowing and access to outside computer data bases. The Library should deal with both print and nonprint materials.
8. The Audio-Visual Services Section should include in its scope: Projection services, equipment loan; A-V equipment supplies and maintenance; consulting on A-V equipment purchasing; A-V equipment inventory and storage; audio-visual production services including slides, transparencies, audio recordings and duplication, photographs; instruction on using A-V materials and equipment; television recordings and playback; and graphic and art services.

9. The Printing Services Section should include in its scope: Photo copying, photo typesetting, offset printing, trimming, binding, packaging, transparency production and print media consulting.

10. The administration and staff of the T/LRC must maintain an attitude of service and develop procedures to access services which promote creativeness on the part of teachers, researchers and students.

11. The organization of the T/LRC should be according to the diagram below. The T/LRC Advisory Committee and T/LRC Administrative Committee should both act in an advisory role to the Head of the T/LRC and not as governing bodies. As the Editorial, Translation and Design Section, the Financial Section and the Mail Room work with and serve the other three operating sections, they should report to the Head so as not to become too aligned with any one section. The same is true with respect to the secretaries. (See Appendix A - Table of Organization.)



REPORTING STRUCTURE OF THE T/LRC

12. Library facilities should be developed to accommodate a minimum of ten years growth in the collection. With the current holdings at approximately 18,000 volumes, the library should be planned to hold 40,000 volumes. This recommendation is based partly on the fact that the library is still in its initial development stage and during this period growth should be more rapid than when the collection is more complete. At the time of the move into the new T/LRC facilities in Building No. 2, the library materials now held in departmental collections should be integrated with the materials from the Documentation Center into a single University library collection.

13. In addition to the use of one-time monies from AID to purchase the equipment covered in Appendix C of this report, consideration needs to be given by the administration of the University to the on-going funds of the Teaching/Learning Resource Center. It is not at all unreasonable to expect the University to budget at least four percent of its total budget on library services. In the developmental stage of the T/LRC services, and considering that audio-visual and printing services are included in the T/LRC, it may be quite reasonable to expect that six percent of the total University budget be spent each year for the T/LRC. Special funds and foreign aid money for specific projects should be on top of the four to six percent of the annual budget earmarked for the T/LRC.

Without this kind of financial commitment, there is no way that a significant library collection or meaningful library and audio-visual service offerings can be developed to give viable support to the teaching, research and extension programs of the University.

14. A T/LRC budget should be developed that will insure that recurring funds be available each year to pay for a basic list of journal subscriptions supporting the research and teaching programs of the University. This basic list should be identified by the Departments and be renewed by the Library Services Section automatically each year. A system could be outlined that would send the renewal decision back to the Department only in the event of an unusually high increase in the cost of the subscription.

15. A recurring budget needs to be developed to provide for the binding of journals. The initial amount for this will be out of proportion to a normal year's binding in that little or no binding has been done since the library was started. As the collection grows and becomes more accessible, the current use of boxes to store journal parts will become more space consuming and more cumbersome to use.

16. IUTAD has developed to the degree that it should have a communications specialist to perform design and editorial functions for the increasing number of publications being generated. This person should be skilled in consulting with authors on publications planning and design, analysis of audiences for message selection and message treatment, and for marketing (promotion) and distribution of publications. Communications personnel or staff should develop and write news stories about IUTAD and its activities to be distributed regularly and dependably to news media serving the area of IUTAD influence.

Creation of news and public relations staff positions would enable IUTAD to extend information for decision making by farmers and other users, and would help build and reinforce IUTAD's reputation and influence in community and regional education and service. News articles publicizing and recognizing successful users of information generated by IUTAD would give prestige and authority both to the Institute and its information. Mass media play an important role in creating awareness of innovative practices. And awareness is the vital first step toward adoption of desirable practices or changes of behavior.

This work could be started in the office of the T/LRC Editor (see Appendix A), but should at some time be expanded to a separate office dealing with public relations and IUTAD news.

17. It was evident early in meetings with faculty and students that there is little, if any, awareness or complete understanding of what the T/LRC is or how they can expect it to help them. For several years, the T/LRC has been a vision and a dream in the minds of IUTAD administrators. When this dream is brought into being, it will be an asset to education and development in this region. A thorough explanation and exploration of the concept of T/LRC and an invitation to participate in its realization will

strengthen the unity of IUTAD in the minds and feelings of faculty, students, and other users of its facilities. Therefore, the team proposes that a communication effort be launched by IUTAD administration to make every opportunity to inform faculty, students and other potential users about T/LRC.

This can be done in several different ways, following Berlo's model of communication process (1960). (See Appendix E.)

18. The major change in the administrative section of the T/LRC when compared with the present Documentation Center is that the Head will spend little time on the day-to-day operation of the T/LRC. The Head's activities will be in promotion of services, liaison with the administration and department heads, liaison with outside agencies that do not go through departments, selecting major production projects and, with the Editor, working on editorial, translation and educational design projects from the administrative point of view and budgets. The Head will provide general supervision for the Editor, lead financial clerk and lead secretary.

19. The major change in the library section, compared to the present Documentation Center, will be a change from many departmental collections to a single collection with more open access. There should also be an increase in the number of library hours open for student use and study and improved access to the catalog. With a professional librarian on the staff there should be an increase in reference questions that can be handled. Binding of the journals should improve the ease of use and access. Carrels for use of audio-visual materials within the library will be possible.

20. A great change will take place in audio-visual services available when staff, equipment and facilities are in place. The T/LRC should be able to provide a greater variety of equipment loans and projection service jobs. The following types of items will be within the capability of the T/LRC:

GRAPHICS:

Posters, charts, signs, flip charts, simple displays, camera ready copy, limited art work, lettering, mounting, laminating, transparencies.

PHOTOGRAPHY:

35 mm color slides, black and white prints, arrange for color prints, 35 mm color slide duplication, 35 mm color negatives.

AUDIO:

Provide amplified sound (voice and music), produce open reel and cassette recordings and duplicates, produce synchronized slide/tape productions.

TELEVISION:

Receive broadcast television, record single camera programs, playback recorded TV programs, make duplicate video programs, perform simple editing to produce a composite video recording.

The audio-visual section will also provide training to staff and students on how to use equipment and produce simple visual and audio teaching materials.

21. One of the greatest resources that could be shared among the institutions of higher education in Portugal is that of human knowledge. The people on each campus who are specialists in areas not covered on other campuses could go to the students in those other locations if there was a way to move people rapidly. Unfortunately, the drive between campuses requires hours of travel, often on mountain roads. Another solution to the problem would be to establish a telecommunications system between the campuses via telephone lines and/or micro wave transmission. This would allow the information to be transmitted without the necessity of moving people.

Such a system has been successfully established in the State of Indiana, U.S.A., and serves fifteen educational centers throughout the State. Appendix I provides an overview to this system, the legislative authorization, developmental history, some technical data and the long range planning used for the system in Indiana. A similar plan for Portugal could be developed using this information as a guide.

In a discussion with the people at LNETI in Porto, there seemed to be interest in such a plan. A system which would connect Vila Real with Porto would be an important first step in developing a national or

regional network. This is not a simple or inexpensive project to undertake, but with legislative support and inter-institutional cooperation, it could provide a substantial increase in the quality of education at a cost that would be less than trying to duplicate teachers in all locations, that now exists in a few locations, or by moving people which is a very inefficient use of human resources.

REFERENCES:

- (1.) Penna, Sewell and Liebaers, THE PLANNING OF LIBRARY AND DOCUMENTATION SERVICES, second edition, UNESCO 1970.
- (2.) Josefa E. Sabor, RECONSIDERATION OF THE CONCEPT OF LIBRARY FUNCTIONS IN LATIN AMERICA, UNFSCO Bulletin for Libraries, Vol. XX, No. 3, May-June 1966, p 198-16, 135.

APPENDIX A

P e r s o n n e l

## PERSONNEL

Head - T/LRC

The person who heads the T/LRC must be an individual who understands high level educational administration, is service minded and is willing to delegate work to the specialists and technicians who staff the sections of the Center. Desirable experience for the position would include several years of successful experience working with top officials of a university, department heads, researchers and teachers in bringing about reasonable compromises between services provided and available funds; a good working knowledge of budget preparation and financial management; the coordination of services involving a staff of varied specialists; and classroom teaching. Other desirable experience or qualities would include a job history of putting service to the client ahead of convenience of the staff while at the same time keeping up good staff morale; work in public relations and/or mass media; library work experience or training; and the ability to keep track of many diverse projects at one time while being directly involved with only a few.

A university degree in mass communications, instructional systems technology or librarianship would be useful.

It would, of course, be difficult to find a single person with all of these experiences and qualities. They are all important; but having an attitude of service would be the primary quality in the Head of the T/LRC. The T/LRC is to be a service organization supporting the communications efforts of the University and from the top down should promote creativity in information transfer rather than stifle it.

The Head should report directly to the Reitor. This person will supervise the Chief of the Financial Section; the Editorial, Translation and Educational Design Section, the Chief of Printing Services; the Chief Librarian; the Chief of Audio-Visual Services and coordinate the T/LRC Advisory and Administrative Committees.

Editor: Editorial, Translation and Educational Design Section

The person or persons working in this unit of the T/LRC must have strong language abilities in Portuguese and able to translate into Portuguese from one or more of the following languages: English, French, German and Spanish. An understanding of language levels suitable for various target audiences is necessary and a background in agriculture would be very useful. An ability to work with scientific and technical people to convert their information into language suitable for other audiences is required.

Working as a team with researchers, teachers, and extension personnel and with production specialists from the T/LRC, this staff member will assist in the design and production of finished material in both print and audio-visual formats.

It is recommended that in addition to one regular staff member in this unit, that provision be made to pay overload to teaching and research staff members when their particular expertise in subject matter or language ability is needed to complete a project. This would provide a wide range of available talent and be an expense only during the life of a particular project. The regular staff member will coordinate news release projects with recurring deadlines, Portuguese language projects requiring attention to audience level and translation projects within language abilities.

The Editor will serve as a member of the T/LRC Administrative Committee, and should report to the Head of the T/LRC.

Chief of Library Services

The person in this position should be a professionally trained librarian with an understanding of both technical processing and readers service activities. Some years of experience in a small to medium sized school or public library would be useful.

The Chief of Library Services will direct the work of two readers service clerks and six technical service clerks as well as working with other University staff in the selection of materials and providing reference service. The Chief will work with the Head of the T/LRC and the lead financial clerk on budget matters and be a member of the T/LRC Administrative Staff Committee.

Early tasks that will require the attention of the Chief of Library Services include an evaluation of the classification system currently being used; the establishment of a single library collection to serve the needs of students, teachers, researchers, extension specialists and visitors to the University; the binding of back runs of journals and provision of photocopies for scholarly use within the guidelines of the copyright laws.

Other continuing activities to be managed include: interlibrary loan services, access to computer data bases for bibliographic purposes and ordering and cataloging of new materials.

The Chief of Library Services reports to the Head of the T/LRC.

#### Chief of Audio-Visual Services

The person who fills this position should have formal training and/or experience in audio-visual materials production and some knowledge of graphics, photography, television and audio. With the assistance of two and eventually three audio-visual technicians, this person will be expected to provide projection services to the University and some outside agencies, loan audio-visual equipment, produce signs, posters, charts, photographs, slides, transparencies, video and audio recordings and help teachers and students learn to use them effectively in making presentations. Maintenance and repair of the audio-visual and production equipment is also the responsibility of this individual.

A basic understanding of electrical, electronic and mechanical equipment is desirable along with the ability to help other staff members visualize their ideas.

The Chief of Audio-Visual Services will work closely with the T/LRC Head and Editor and with other University staff members who make requests for the production of audio-visual materials, and will serve as a member of the T/LRC Administrative Committee.

The Chief of Audio-Visual Services reports to the Head of the T/LRC.

#### Audio-Visual Repairman (future position)

This individual should be a graduate of an Electrical Engineering Technology program and have basic skills in electrical, electronic and

mechanical repair. A knowledge of circuit diagrams, parts lists and mechanical drawings would be necessary. Experience as a bench repairman and in the use of audio-visual and television equipment would be useful.

#### Printing Services Section

Jobs in the Printing Services Section have been established for some time and will change very little as a result of the formation of the Teaching/Learning Resource Center. These six positions are not further described in the report or in Appendix A except as noted on the Table of Organization. The current leader in the print shop should be named as Chief of Printing Services and become a member of the T/LRC Administrative Committee.

#### Financial Section and Mail Room

These three jobs will continue with little immediate change and will not be described further except as noted on the Table of Organization.

#### Library Services Section

There will be somewhat more change in the jobs of the persons in the Library Services Section but this change will not occur until the Chief of Library Services is in place. These eight positions, at first, continue as they are now working and will not be described further except as noted on the Table of Organization.

#### Secretaries

The work of the secretaries will continue with little immediate change. They will receive their work from the Head of the T/LRC, the Editor and the three section chiefs. No further job description is given here except as noted on the Table of Organization.

#### The T/LRC Advisory Committee

Each department of the University should assign a teaching or research staff member as a liaison with the T/LRC and to serve as a member of the T/LRC Advisory Committee. Other members of this advisory group should include a representative of the Regional Office of the

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Ministry of Agriculture and other regional agencies having regular use of the services of the T/LRC. This group will be somewhat diverse and will not always be interested in the problems of other members of the Committee, but it can be a good sounding board for new programs being developed by the T/LRC and can provide feedback to the Head on the quality and effectiveness of current services. It should meet no more than four or five times a year and an agenda should always be circulated to the members well in advance of the meeting.

The agenda for each meeting should include a report from the Head of the T/LRC giving an overview of new acquisitions, staff changes, unusual projects, new service offerings, etc.; reports from members, particularly up-coming projects and quality of service reports, if any; some service of the T/LRC should be explained in detail at each meeting. The Committee should not approve projects or dictate changes in the T/LRC but the Head should consider it unwise not to give very careful consideration to the suggestions of the majority of the Committee.

The T/LRC Advisory Committee should be chaired by the Head of the T/LRC who should also arrange for secretarial service for the Committee.

#### Departmental Representatives to the T/LRC

Each department of the University should assign a teaching or research staff member as a liaison with the T/LRC who will also serve as a member of the T/LRC Advisory Committee.

Other outside agencies who are heavy users of T/LRC services may be requested to name a representative from their group as a liaison with the T/LRC also. These persons acting as liaison between their group and the Center may or may not be members of the T/LRC Advisory group as determined by the Head of the T/LRC. Representatives to the T/LRC will receive the necessary instructions to allow them to assist other members of their respective departments in accessing T/LRC services. The representatives will also bring departmental problems to the attention of the appropriate T/LRC staff member and in general will act as a communication link between the Center and their department.

The departmental representative to the T/LRC should be a teacher or researcher with a strong interest in teaching and/or extension work and be one with whom colleagues will feel free to discuss communications ideas and problems.

This system of departmental representatives should in no way inhibit any staff member from directly contacting the T/LRC about any communications question. Outside agencies and groups may be requested to do business through their representative.

T/LRC Administrative Committee

The T/LRC Administrative Committee (T/LRC Ad Com) chaired by the Head of the T/LRC should include as members the Editor, the Chief of Library Services, the Chief of Audio-Visual Services and the Chief of Printing Services. When appropriate, others might be requested to attend meetings of this group, such as lead financial clerk, when budgets are being discussed.

The purpose of this committee is to provide an opportunity for the exchange of information on the activities being carried out in each of the operating sections of the T/LRC. The T/LRC Administrative Committee will provide a core group within the T/LRC that understands the overall operation of the Center. This will help to make the T/LRC an integrated service operation rather than a group of separate services. The T/LRC Administrative Committee should foster cooperation among the entire T/LRC staff and encourage problem solving by using services from all sections.

The T/LRC Administrative Committee should meet weekly at a regular time to keep abreast of current activities. Special meetings of the group should be called as needed. The T/LRC Administrative Committee should meet with the entire staff once or twice a year to resolve any problems that effect the operation as a whole.

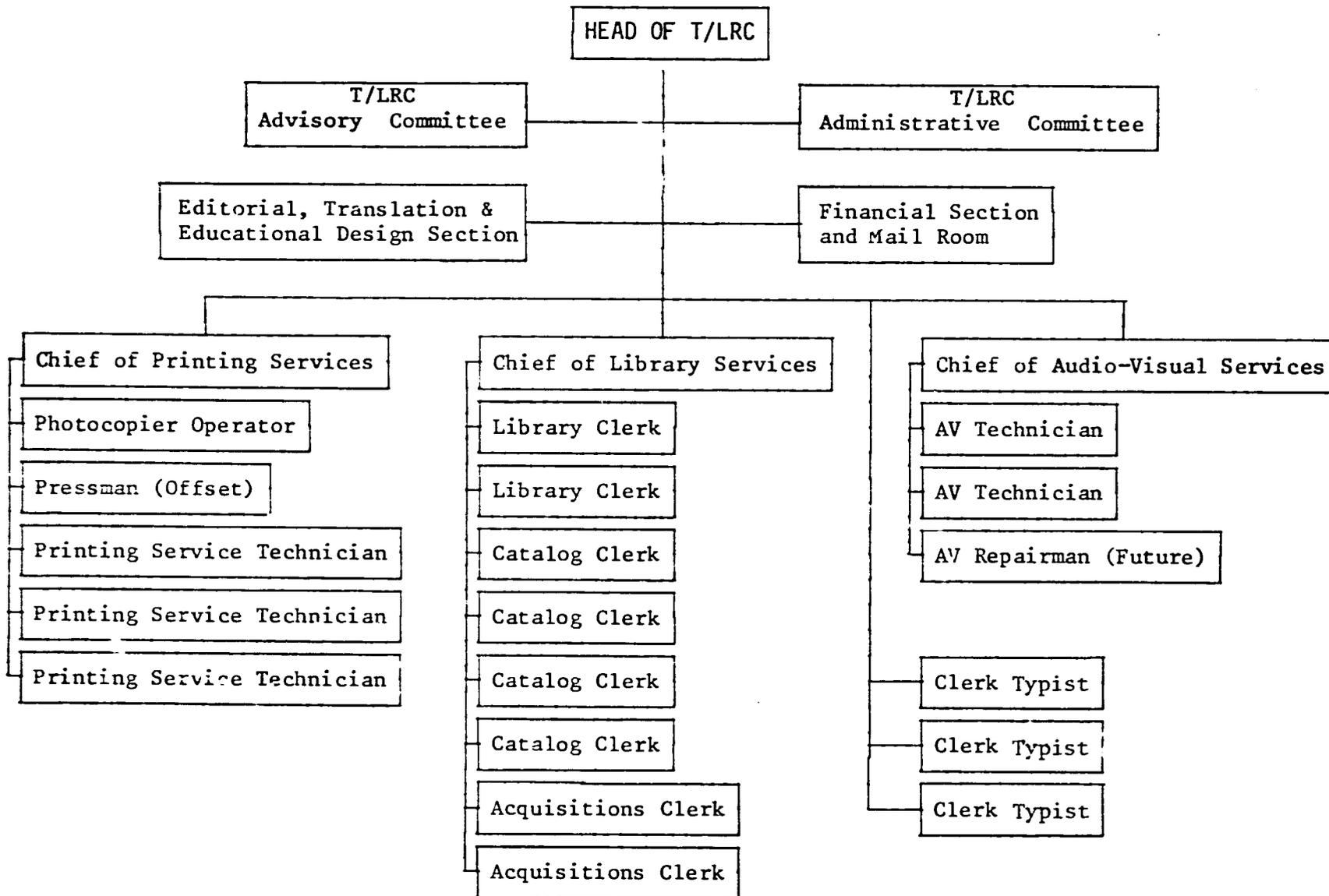


TABLE OF ORGANIZATION

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## SPACE

Three areas were considered as being available for use by the proposed Teaching/Learning Resource Center (T/LRC): All of Building No. 2 in the Pavilion, the Geo-Science space in the new building designated as library space on levels two and three, and the old granite wine production building on the farm.

The old granite building contains less than 600 m<sup>2</sup> of usable space, is out of major traffic patterns for the present and future plans for the campus and would require extensive remodeling which could probably not be accomplished in time to occupy the space in the summer of 1984. This space was rejected as not being appropriate for use as part of the T/LRC.

The Geo-Science library space could in fact house the library collection for the next ten years which is expected to grow to 40,000 volumes but there would be no space left for student seating and the library support services would have to be housed elsewhere as would the audio-visual activities. This space was also rejected as useful T/LRC space but could easily serve the campus as student study space by equipping the second level space, including the outside balcony, with study tables, chairs and some lounge furniture. This area could accommodate approximately 100 students. The librarian's office could be reserved for scheduled conferences between teachers and individual or small groups of students. An unattended library collection of dictionaries, an encyclopedia and possibly a few text books could be made available as well as several newspapers.

Pavilion Building No. 2 has adequate space to house the ten years' growth of the library collection; provide space for sixty student study positions, one-third of which would have audio-visual equipment; house the technical processing staff of the library; provide space for audio-visual services and for T/LRC administration. It is also well located in the campus traffic patterns and near to the location of the printing services. Building No. 2 was selected as the best location for the T/LRC. It will require minimal remodeling and should be able to be occupied within 90 days after the currently occupying departments move to the new building, if construction plans are laid out well in advance.

There seemed to be no need to consider alternate space for the printing services operation as their present space is adequate and the location good.

Remodeling Building Number 2

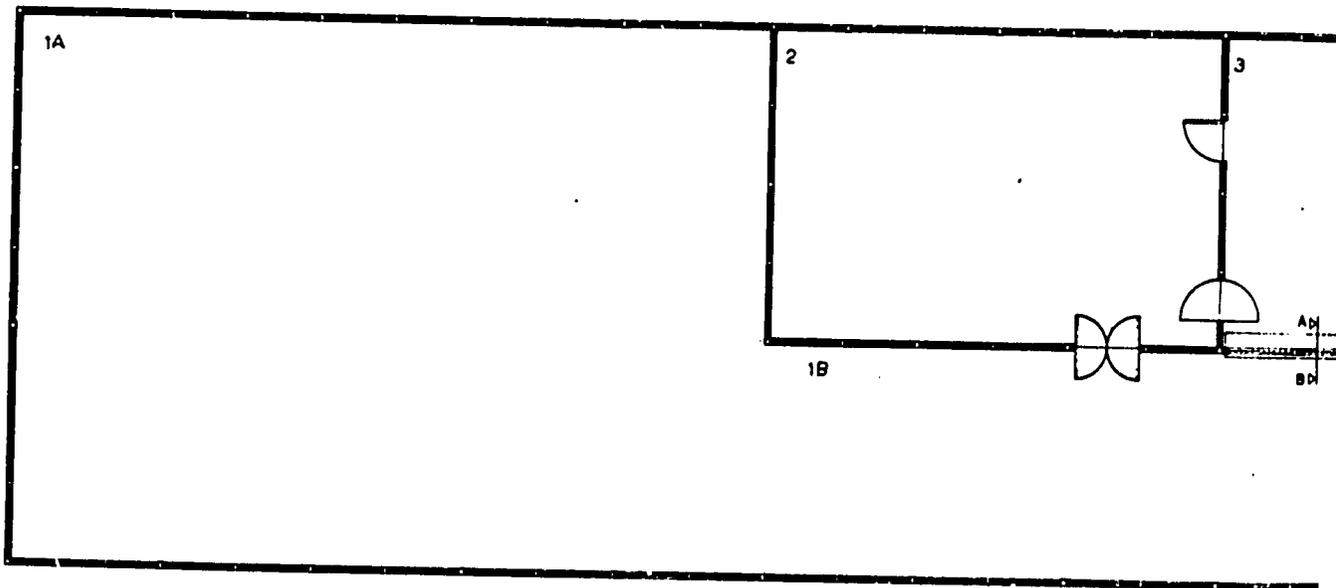
The attached floor plan indicates the necessary changes that need to be made in Building No. 2 to make it suitable to accommodate the T/LRC. Remodeling of the building should start as soon as possible to make it ready to occupy by T/LRC personnel in May or June 1984.

Particular attention should be given to the electrical rewiring for the remodeled building.

1. In Room 1A, the lighting fixtures need to run at right angles to the shelving (see compact shelving layout in Appendix C).
2. In Room 2, there will be twenty study carrels with audio-visual equipment. Provision will need to be made to drop adequate power from the ceiling and from the side walls to supply the necessary power.
3. Rooms 13 and 14 will require a plug strip along the south wall with at least four (4) outlets at a height of one meter.
4. Room 16 will require four outlets along the west wall at a height of 120 cm.
5. Room 17 will require two outlets on the east wall and two outlets on the south wall at a height of one meter.
6. Room 18 should have at least six separate electrical circuits for operating audio-visual equipment and extra lighting for photography and television.
7. Rooms 1B and 2 should have lighting that will produce 70 foot candles at table height.
8. Room 13 needs to be made as sound proof as possible.
9. Room 16 needs to be made light-tight at both the window and the door. If a round metal light-lock can be found, it could be used in the wall between Rooms 16 and 17 instead of the light trap shown on the drawing.

Use of Rooms in Remodeled Pavilion Building No. 2

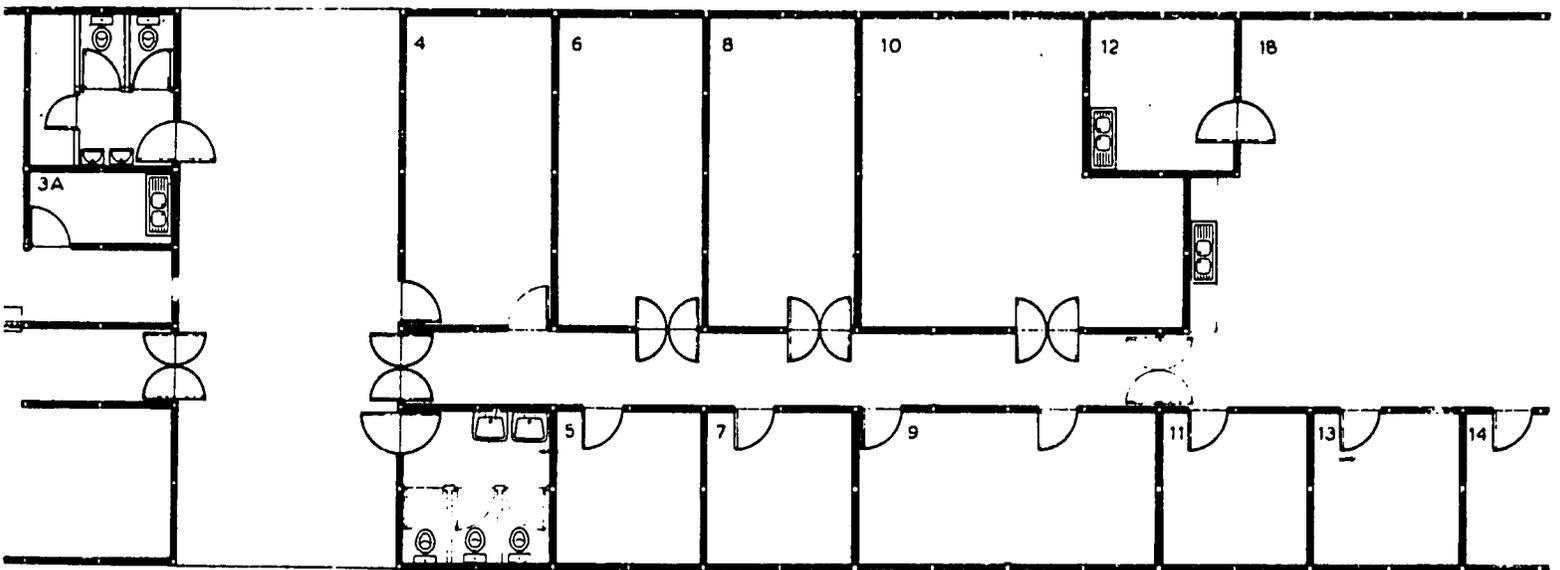
Room	
1A	Library Stacks
1B	Library Seating
2	Learning Lab Study Center
3	Circulation and Reserve Books
3A	Circulation and Reserve Workroom
4	Mail Room and Document Storage
5	Office -- Chief of Library Services
6	Office -- Head of T/LRC
7	Office -- Editor
8	Office -- Financial Section
9	Secretaries' Workroom
10	Library Processing Workroom
11	Office -- Chief of Audio-Visual Services
12	Art and Graphics Workroom
13	Audio -- Workroom
14	Television Workroom
15	A-V Equipment Storage
16	Darkroom
17	Photo Lab
18	Audio-Visual Workroom



LEGENDA

- |                                                     |                                          |
|-----------------------------------------------------|------------------------------------------|
| 1A — Sala de estantes da biblioteca                 | 13 — Sala de trabalho audio              |
| 1B — Sala de leitura                                | 14 — Sala de trabalho de televisão       |
| 2 — Centro de estudo do laboratorio de aprendizagem | 15 — Armazem de equipamento audio-visual |
| 3 — Atendimento e reserva de livros                 | 16 — Camara escura                       |
| 3A — Sala de trabalho de atendimento                | 17 — Laboratório fotografico             |
| 4 — Sala de correio e arquivo                       | 18 — Sala de trabalho audio-visual       |
| 5 — Escritório do chefe dos serviços da biblioteca  |                                          |
| 6 — Escritório do director T/LRC                    |                                          |
| 7 — Escritório do editor                            |                                          |
| 8 — Escritório da secção de finanças                |                                          |
| 9 — Secretaria                                      |                                          |
| 10 — Sala de trabalho bibliotecário                 |                                          |
| 11 — Escritório do chefe de serviços audio-visuais  |                                          |
| 12 — Sala de arte e gráficos                        |                                          |

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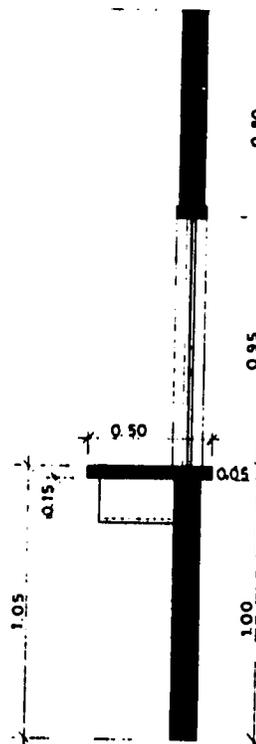
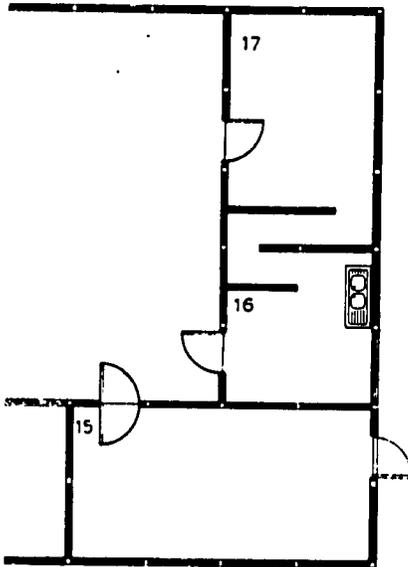


LEGEND

- |                                               |                            |
|-----------------------------------------------|----------------------------|
| 1A — Library stack area                       | 14 — Television workroom   |
| 1B — Library seating                          | 15 — A-V equipment storage |
| 2 — Learning lab study center                 | 16 — Darkroom              |
| 3 — Circulation and reserve books             | 17 — Photo lab             |
| 3A — Circulation workroom                     | 18 — Audio-visual workroom |
| 4 — Mail room and document storage            |                            |
| 5 — Office - chief of library services        |                            |
| 6 — Office - head of T/LRC                    |                            |
| 7 — Office - editor                           |                            |
| 8 — Office - financial section                |                            |
| 9 — Secretaries' workroom                     |                            |
| 10 — Library processing workroom              |                            |
| 11 — Office - chief of audio' visual services |                            |
| 12 — Art and graphics workroom                |                            |
| 13 — Audio' workroom                          |                            |

B-4

CORTE A-B  
esc. 1/20



Des. Nº 179	QUINTA DE PRADOS	IUTAD
ESCALA 1:100 1:20	PAVILHÃO Nº 2 PLANTA	DATA 4/7/83
		DES.
		VER.
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NOTE:  
Drawing has been reduced.  
Cannot be scaled.

## EQUIPMENT FOR THE T/LRC

The following pages contain information about the T/LRC equipment needed in remodeled Building No. 2 and in printing services for the tasks outlined in this report. The equipment listed here represents a ready-to-operate T/LRC with much-improved production capability and a central library for the University. Total cost of the equipment is about 25 percent more than available funds. (See Appendix G for priorities.)

Appendix C shows the equipment to be located in each room in Building No. 2 and in printing services. This organization makes it easy to determine what equipment is to be used for each activity and aids in the delivery of equipment to the correct location. It will be necessary to pay particular attention to the ordering of equipment as the same type of equipment will often appear on more than one page. For example, numbers of library chairs or file cabinets from several pages must be added to determine the total number that need to be ordered.

Because there is more equipment listed than the budget can accommodate, each item on each page has been given a priority, as follows:

Priority I -- These items should be purchased at once. These items play a key function in the operation of the T/LRC. They may be needed before the center opens or they may have long delivery time.

Priority II -- Purchase these items prior to the opening of the T/LRC. It would be helpful to have advice from the senior staff of the T/LRC for these items.

Priority III -- Purchase these items with advice from the senior staff of the T/LRC. Delivery need not be prior to the opening of the T/LRC.

Priority IV -- Purchase these items with advice from the senior staff of the T/LRC if funds are available after priorities I, II and III have been purchased.

Priority V -- This serves to identify Documentation Service equipment that is currently available to be moved into the T/LRC.

The exchange rate in dollars and escudos assumed that \$1.00 equals 120\$00. Prices listed in Appendix C are, for the most part, estimates, although some are quotations received by the Purchasing Department. Prices used here are only to provide a total cost estimate. The Purchasing Department should obtain actual prices from vendors.

The Purchasing Department should review the items listed in Appendix C and array them according to priority. The recommended sequence for handling orders is listed in Appendix G. D. Moses can provide additional information on any item for which a vendor cannot be found or identified.

Storage space for items received prior to the remodeling of Building No. 2 will need to be located and made secure to protect against theft and physical damage of stored equipment. Equipment should be inspected and made to operate properly before it is stored because some equipment may be out of warranty by the time it is actually put into use. No item should go uninspected for more than five days after receipt; contact with vendors and/or carriers should be made immediately if any damage or malfunction is found during inspection.

It is suggested that the same type of shelving be purchased for both library and office use. This will help reduce the cost. The metal shelving should be FOC color No. 2056 (a light tan). The end panels for the mobile units of shelving should also be FOC color No. 2056, and the end panels for the stationary units should be FOC color No. 2041 (dark brown).

There are several high cost items which may require additional justification. These items are reviewed here in order of their listing in Appendix C.

Mobile Compact Shelving (est. 9000 contos/\$75,000)

Mobile shelving is more expensive than conventional shelving with aisles between each range, but it will allow twice as many books to be stored in a given amount of space. Because additional space is not available for the T/LRC, the use of mobile shelving is seen as the only way to accommodate ten years of library development. (Room 1)

Library Card Duplicator (est. 655 contos/\$5460)

Nearly everyone who was interviewed about the accessibility of library materials complained that they could not find out what materials were held in the library. The only catalog of the collection is the official card file in the Documentation Service which, if opened to the public, would soon lose its integrity. The most reasonable solution at this time is to duplicate the card catalog and make the copy public. The U-BIX Card Printer 2 is a specialized duplicator designed to do just the kind of job that is required and it will be useful in the future for maintenance of the card catalogs. (Room 10)

Printing Service Equipment (up to 11,750 contos/\$97,900)

The Printing Service is now using a number of old pieces of equipment. The paper trimmer is nearly a museum piece, the binding equipment is primitive and the best of the offset presses is quite worn. Since the print medium will continue to be a primary format for the dissemination of University information, both on and off campus, it would be desirable to upgrade the equipment at this time. If the entire T/LRC project is short of money, any one of the six pieces of equipment could be deleted to save a substantial sum. However, it might be easier to obtain funds later, or from other budgets, to purchase some of the less expensive equipment on the list and keep these large cost items in the special equipment funds for the T/LRC. (Room Printing Services)

Film Processing Machine (1080 contos/\$9,000)

From the standpoint of production volume, this film processor seems to be a luxury item. If the local production of color slides can be planned far enough in advance to send films to an outside processing firm, and if there would never be a need for rapid slide production, this machine would not be needed. This item should be discussed by the Head of the

T/LRC and the Chief of Audio-Visual Services in light of anticipated volume of slide production and the time between shooting pictures and the need to use slides. This machine will need a well trained technician. This unit would give the T/LRC a great deal of control over the production of slide sets that it would not have if film must be sent to an outside processor. More investigation is needed to determine if there are less expensive processing units available in Europe for Agfa brand films. (Room 16)

Slide Duplicator (1332 contos/\$11,100)

Like the film processor above, this unit is a high production model. Other less expensive units are available which work at a slower speed and permit less control over lighting conditions. The Head of the T/LRC and the Chief of Audio-Visual Services should investigate this further. (Room 17)

Slide Production Equipment. The T/LRC should have a capability of producing and duplicating color slides. The question to be decided is at what level of production. Although it would take larger sums of money to expand the slide production capability later, consideration should be given to having good camera equipment for producing original slides and exposing duplicates. The processing can be done outside until there is sufficient volume of use to justify the acquisition of a film processor and slide mounter. Small quantities of slides can be processed with inexpensive tanks in the photo darkroom and mounted with an inexpensive mounter. Larger projects would require more time to produce, allowing for external laboratories to do the processing and mounting. It would take 25 rolls of film per week for five years to amortize the film processing and mounting equipment on the list. Justification of these items and investigation of alternatives needs to be done before purchases are made.

Items not included in the list of equipment in Appendix C include: computer equipment (see Computer Capability for the T/LRC on page C-31 of Appendix C) and tables and chairs to furnish the Geoscience library space on the second level of the new building as a student study space. This space could seat approximately one hundred using 56 chairs, 28 tables for two and 12 lounge chairs inside, and six round tables with sun umbrellas and 36 chairs outdoors. A table and 4 to 6 chairs could be put in the librarian's office space. (See Appendix B-1, paragraph 3.)

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Mobile compact shelving		FOC		9000 contos/ \$75,000 est.
	Single faced stationary 30 cm x 6 m	2			
	Double faced stationary 60 cm x 5 m	2			
	Double faced mobil 60 cm x 5 m	18			
	Single faced stationary 30 cm x 3 m	1			
	Double faced stationary 60 cm x 3 m	2			
	Double faced mobil 60 cm x 3 m	10			
	Including installation (287 ea. 950 mm wide stacks, 7 shelves high equals 1,544.7 linear meters of shelving with a 40,650 volume storage capacity.)				

Compact Library Materials Shelving

The compact, mobile shelving used to house the T/LRC library collection consists of the following equipment and was determined by the data shown below.

2 Stationary Ranges, single face, 6 stacks long	12 Sections
2 Stationary Ranges, double face, 5 stacks long	20 "
18 Mobile Ranges, double face, 5 stacks long	180 "
1 Stationary Range, single face, 3 stacks long	3 "
2 Stationary Ranges, double face, 3 stacks long	12 "
10 Mobile Ranges, double face, 3 sections long	60 "
	287 Sections of shelving

Based on 25 volumes per 950 mm shelf (26 vol. per meter) if one-third of the stacks are 5 shelves high and two-thirds are 6 shelves high then:

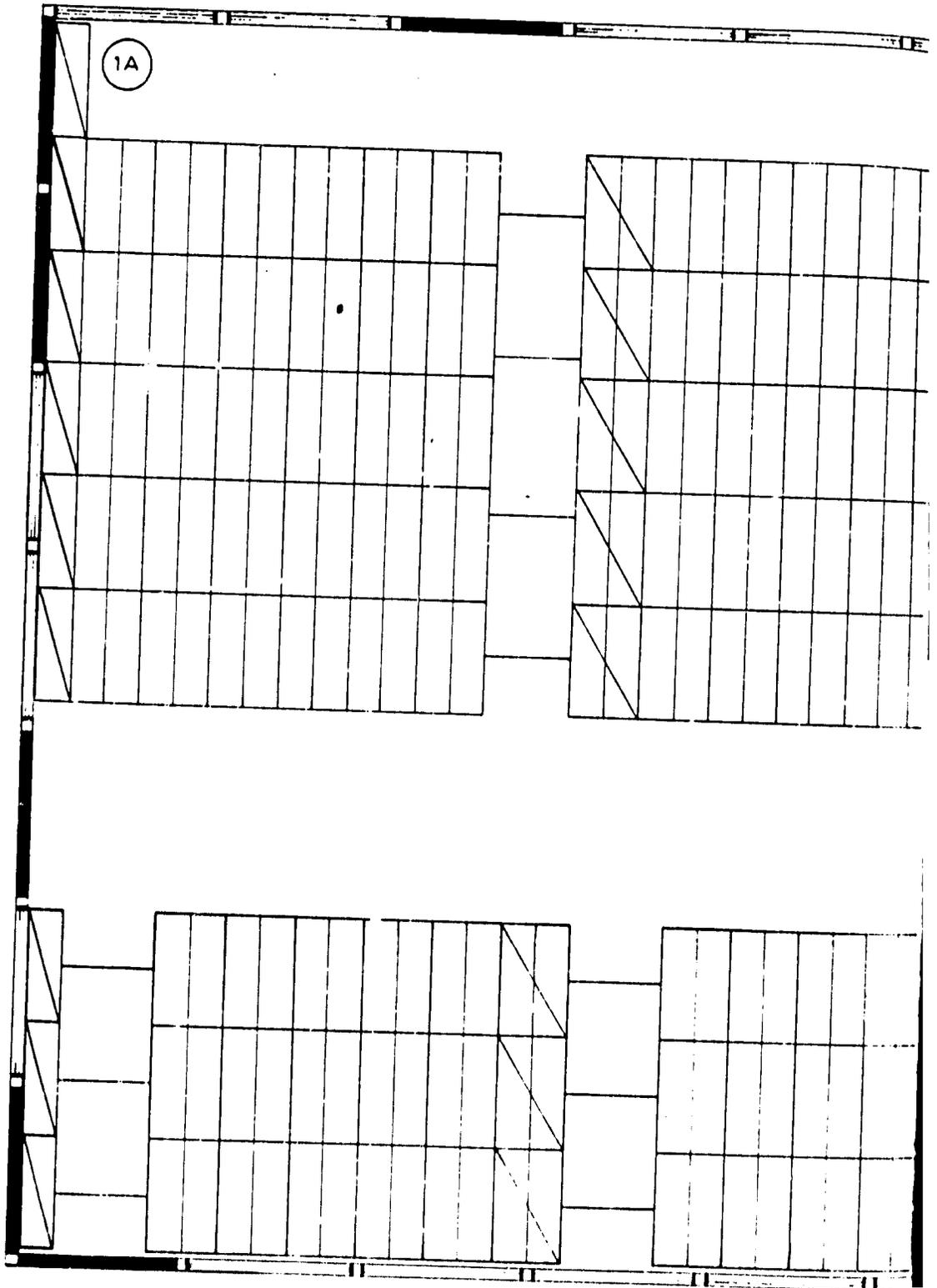
96 sections of 5 high at 125 vol./sec.	=	12,000 vol. ( 456 m)
191 sections of 6 high at 150 vol./sec.	=	28,650 vol. (1088.7 m)
<u>287 sections total</u>		<u>40,650 volumes</u> on 1,544.7 m of shelving

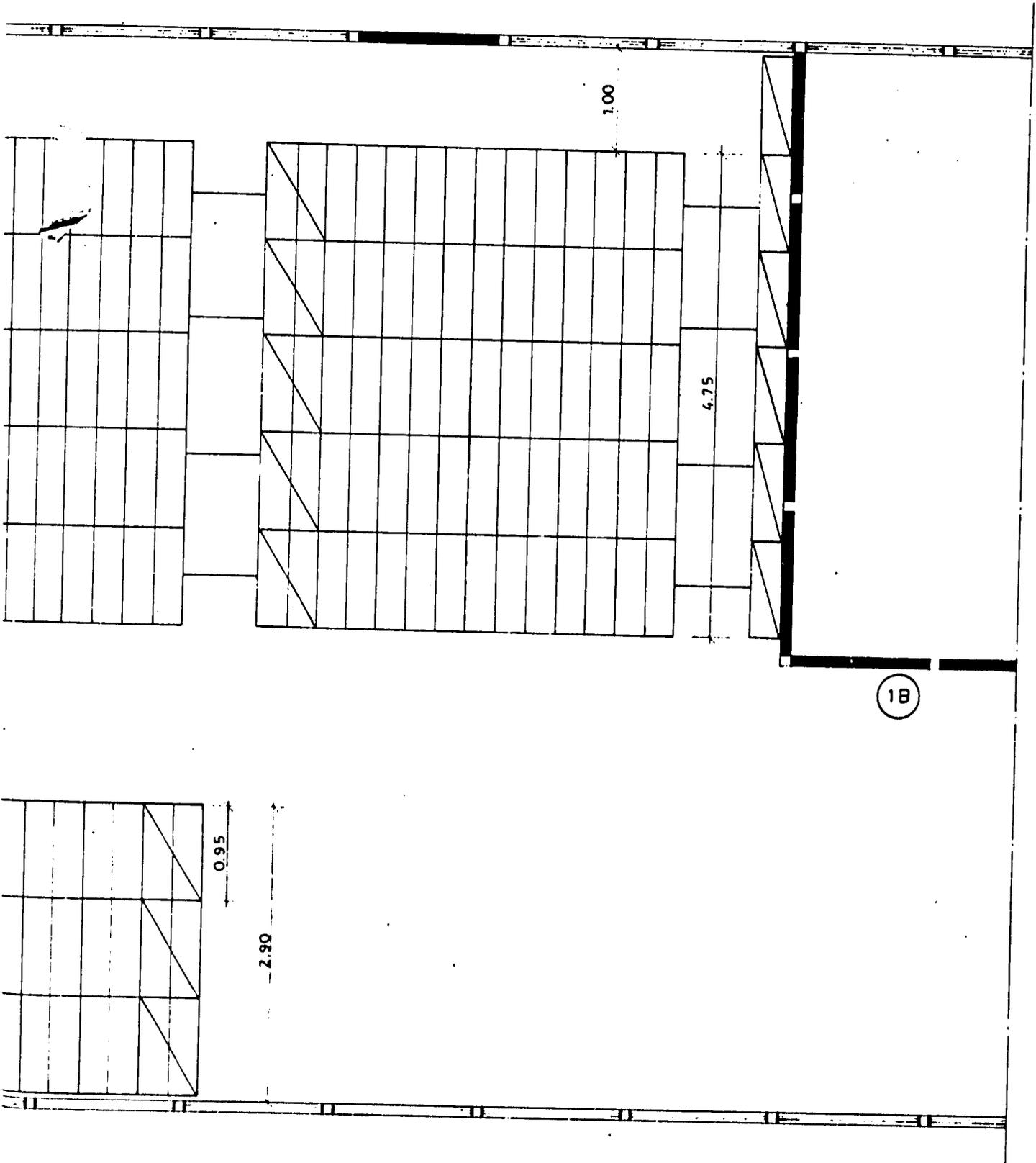
Mobile Compact Shelving

Bids should be sent to FOC and Longra requesting an estimated price for installation of compact shelving in the north end of pavilion Building No. 2 in a layout similar to that shown on the drawing provided. Request initial price quotation within 30 days with a firm quotation to be submitted within 30 days after company representatives have had a chance to take their own measurements on site and developed their own layout plan. The firm bid should indicate completed installation date or time assuming a start date of April 1, 1984.

The equipment provided by FOC and Longra are not the same and accepting the low bid could result in a poor decision. It is the conclusion of D. Moses that the FOC product is the better of the two. This opinion was reached after seeing samples of both products. The track used by FOC is considerably more substantial than that used by Longra. Longra's color choice is limited to one shade of gray. FOC offers at least six colors and will mix end panels to identify stationary units at no extra cost. The presentations received from the two companies were not equal. Longra's representative was not completely knowledgeable about the product but had not received the advanced notice of the meeting that the FOC representative had received. It may be that a more knowledgeable representative from Longra could narrow the quality differences between the products offered by the two companies. Moses, however, would contend that based on the track used, the overall appearance, type of cranks used, and the type of end panels used over the drive system that the FOC product would provide the most years of trouble-free service of the two.

1A





C-8

# IUTAD

TOPO SUL DO PAVILHÃO . Nº 2

— PLANTA —

Proposed layout for compact mobil library storage. Approx. 1545 m of shelving for approximately 40,650 volumes.

"Layout" proposto para armazenagem movel de biblioteca compacta. Aproximadamente 1545 m de prateleiras para aproximadamente 40650 volumes.



Esc. 1/50

Des. Nº 178

NOTE:

Drawing has been reduced.  
Cannot be scaled

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Library chair	34	FOC N/Ref. <sup>a</sup> 18.60	5,500\$00/\$45	187,000\$00/\$1558
I	Study tables 80 x 80 x 70 Ait	34	FOC N/Ref. <sup>a</sup> 43.07	5,000\$00/\$42	170,000\$00/\$1417
I	Dictionary stand (small table 70 x 60 x 70 high)	1	FOC N/Ref. <sup>a</sup> 43.97	3,970\$00/\$33	3,970\$00/\$33
V	Document display rack	1	from S.D.		-0-
I	Card catalog 60 drawers 5 x 3 files on stands	1	Demco 141-2170, oak finish		111,000\$00/\$925
III	Bulletin board 1 m x 1.5 m	2			
	Cork tack board	1			
III	Pencil sharpener	1			
III	Wall clock	1			

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Library Chair	30	FOC N/Ref. <sup>a</sup> 18.60	5.500\$00/\$46	165.000\$00/\$1375
I	Study Table 80 x 80 x 72	6	FOC N/Ref. <sup>a</sup> 43.07	5.000\$00/\$42	150.000\$00/\$1250
I	Study carrels with 20 cm book-shelf. Without drawers 1220 x 670 with side panels extending to the front edge of the work surface. Per drawing	20	FOC (per attached drawing)	15.000\$00/\$125	300.000\$00/\$250
II	Cassette playback units	12	Sharp Model RD654AV	9600\$00/\$80	115.200\$00/\$960
II	2 x 2 sound slide projectors with built in screen and cassette player	4	Eastman Kodak Ektagraphic Model 410 playback with program stop	78.720\$00/\$656	314.880\$00/\$2624
II	Sound filmstrip projector with built in screen and cassette player	1	Dukane Corp. Mini-Matic II 28A42A	37.800\$00/\$315	37.800\$00/\$315
II	Silent filmstrip projector with built in screen	2	General Audio-Visual, Inc.	11.400\$00/\$95	22.800\$00/\$190
II	1/2" VHS Player - standard play	2	Panasonic NV-8170	150 contos/\$1250	300 contos/\$2500
II	Video Monitor - color 10"	2	Panasonic CT-110MA	57 contos/\$475	114 contos/\$950
II	Headphones	24	Telex Communications, Inc. Model 510	1320\$00/\$11	31.680\$00/\$264
II	8 mm sound projector	1	Elmo HiVision SC-18 2 track	40 contos/\$333	40 contos/\$333

CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

PRIORIDADE	DESCRICA0	NC UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
III	Vertical Files, 4 drawer 75 x 45	6	4 from S.D., 2 new	20 contos/\$167	40 contos/\$333
I	Circulation counter (Built in under window in west wall.) 105 mm high with pidgeon holes under approx. 280 x 50 including wall thickness and overhang. High impact plastic laminated top.	1	Local design and construction		
II	Stool 75 cm high with upholstered seat and back (drafting stool)	2	Longra 1.4.270	9.175\$00/\$76	18.314\$00/\$153
	Library shelving (same as used in compact shelving) 300 x 950 single shelves	16	FOC	12 contos/\$100	192 contos/\$1600
	1 Range doubled faced x 3 units 950 wide 7 shelves				
I	2 Ranges single faceu x 3 units 950 wide 7 shelves				
I	2 Ranges single faced x 2 units 950 wide 7 shelves				

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C-11

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Shelving 2 Ranges of lea 950 mm x 300 mm x 1950 mm	2	FOC	12 contos/\$100	24 contos/\$200
V	1 Steel cabinet 1 m x 0.45 2 door	1	from S.D.		-0-

## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

Documental Storage  
SECTOR and Mail RoomSALA NO 4

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Shelving - color 2056 1 Range, single face, x 3 - 950 units 1 Range, single face, x 5 - 950 units 1 Range, double face, x 3 - 950 units	14	FOC 26.01	12 contos/\$100	168 contos/\$1400
V	Desk 60 x 120	1	From S.D.		-0-
V	Table 60 x 70	1	From S.D.		-0-
V	Table 55 x 110	1	From S.D.		-0-
V	Chair	1	From S.D.		-0-
V	Steel cabinet 450 x 1000 x 2000, 2 doors	1	From S.D.		-0-

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CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Chief Librarians  
Office

SALA NO 5

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
II	Vertical files, 4 drawer	3		20 contos/\$166	60 contos/\$500
V	Side chair	1	From S.D.		-0-
V	Desk 70 x 120	1	From S.D.		-0-
V	Desk chair	1	From S.D.		-0-
I	Library Shelving 1 Range of 3 units 7 shelves	3	FOC	12 contos/\$100	36 contos/\$300

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CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

Office & Conference  
SECTOR Head of T/LRC

SALA NO 6

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
II	Desk	1	Similar to IMO Ref. 101.132	30 contos/\$250	30 contos/\$250
II	Desk chair	1	Longra Ref. 1.4.210	11.100\$00/\$93	11.100\$00/\$93
I	Library chair	4	FOC Ref. 18.60	5.500\$00/\$46	22 contos/\$184
I	Table 120 x 60 x 74 Ait	1	FOC Ref. 43.98	8 contos/\$67	8 contos/\$67
I	Library shelving 1 Range 2 units 7 shelves	2	FOC	12 contos	24 contos
II	Vertical files 4 drawers	3		20 contos/\$100	60 contos/\$300
V	Display board, white	1	From S.D.		-0-

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PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
II	Vertical files, 4 drawer	3		20 contos/\$167	60 contos/\$500
V	Side chair	1	From S.D.		-0-
V	Desk	1	From S.D.		-0-
V	Desk chair	1	From S.D.		-0-
I	Library shelving 1 Range of 3 units, 7 shelves	3		12 contos/\$100	36 contos/\$300

## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Business and  
Financial OfficeSALA NO 8

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
V	Desk 1.20 x 0.70 m	2	From S.D.		-0-
V	Steel cabinet 2 door 1.00 x 0.45 x 2.00 mm	3	From S.D.		-0-
V	Top opening file w/stand 0.57 x 0.40 x 0.34 mm	3	From S.D.		-0-
V	Double file 5 x 3" 0.50 x 0.32 x 0.14 m	8	From S.D.		-0-
V	Double file 9 x 6" w/stand 46.5 x 0.51 x 0.19 m	7	From S.D.		-0-
V	Double file 10 x 14" w/one stand, 0.52 x 0.50 x 0.21 m	4	From S.D.		-0-
V	Table 0.70 x 0.60 m	4	From S.D.		-0-
V	Table 1.20 x 0.60 m	1	From S.D.		-0-

of

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
V	Photo copy machine	1	From S.D.		-0-
V	Desk 1200 x 700	3	From S.D.		-0-
V	Desk 1100 x 50	2	From S.D.		-0-
V	Steel cabinet 2 doors 1000 x 450 x 2000	1	From S.D.		-0-
V	Double 5 x 3" files	2	From S.D.		-0-
V	Double 10 x 4" files	1	From S.D.		-0-
V	Table 700 x 600	4	From S.D.		-0-
V	Table 1100 x 550	1	From S.D.		-0-
V	Typewriter - manual	1	From S.D.		-0-
V	Typewriter - microprint	1	From S.D.		-0-
V	Typewriter - electric	4	From S.D.		-0-
V	Chair	6	From S.D.		-0-

## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Library  
Processing RoomSALA NO 10

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Library card duplicator for 75 x 125 cards	1	U-BIX card printer 2	655 contos/\$5460	655 contos/\$5460
V	Desk 1200 x 700	6	From S.D.		-0-
V	Table 700 x 600	5	From S.D.		-0-
V	Double files 5 x 3" w/stands	32	From S.D.		-0-
V	Double files 10 x 4" w/stands	2	From S.D.		-0-
V	Steel cabinet 2 doors 1000 x 450 x 2000	2	From S.D.		-0-
V	Steel cabinet 3 doors 1500 x 500 x 1800	1	From S.D.		-0-
V	Telephone stand	1	From S.D.		-0-
V	Table 1100 x 550	2	From S.D.		-0-
V	Metal shelving 1840 x 300 x 2000	1	From S.D.		-0-
V	Typewriter - manual	1	From S.D.		-0-
V	Chair	8	From S.D.		-0-

## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Office  
Chief of A-V SectionSALA NO 11

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
II	Vertical files, 4 drawer	3		20 contos/\$167	60 contos/\$500
V	Side chair	1	From S.D.		-0-
V	Desk 70 x 120	1	From S.D.		-0-
V	Desk chair	1	From S.D.		-0-
I	Library shelving 1 Range 3 units wide 7 shelves high	3	FOC	12 contos/\$100	36 contos/\$300

CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Art and Graphics Room

SALA NO 12

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
III	Drafting table 80 x 140	1	ITISE ARTIS cm 80 x 140	20.000\$00/\$167	20.000\$00/\$167
III	Map case Base 5 drawer unit Top	1	Longra 5.4.190	3.272\$00/\$27	3.272\$00/\$27
		2	Longra 5.4.190	26.826\$00/\$224	53.652\$00/\$443
		1	Longra 5.4.190	3.920\$00/\$33	3.920\$00/\$33
III	Steel cabinet 2 doors 970 x 425 x 1950	2	FOC 01.82	20.110\$00/\$168	40.220\$00/\$335
III	Stool, drafting with foot support and floor guides, adjustable from 520 mm to 770 mm	1	Longra 1.4.270	9.157\$00/\$76	9.157\$00/\$76
III	Drafting machine	1		20.000\$00/\$167	20.000\$00/\$167

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## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Audio Recording  
WorkroomSALA NO 13

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Library Shelving 1 Range 2 units 7 shelves	2	FOC	12 contos/\$100	24 contos/\$200
II	Study table 80 x 80 x 70 Ait	3	FOC N/Ref. 43.07	5 contos/\$42	15 contos/\$125
II	Swivel chair w/wheels	2	Longra Ref. 1.4.220	9 contos/\$75	18 contos/\$150
II	Wall-hung projection screen 50" x 50"	1	Draper Shade and Screen Co. Model V	4200\$00/\$35	4200\$00/\$35
II	Steel storage cabinet 2 doors 910 x 425 x 1950	1	FOC Ref. 01.82	20.110\$00/\$168	20.110\$00/\$168
II	Audio Cassette Duplicator	1	SONY Model CCPII Cassette-to-cassette dupli- cator for 220V 50H <sub>2</sub>	156 contos/\$1300	156 contos/\$1300
II	Dual deck cassette recorder with slide sync and case	1	Sharp Model RD-688 SS	91.200\$00/\$760	91.200\$00/\$760
II	Audio recorder - open reel	1	SONY, Model TC-399	51.000\$00/\$425	51.000\$00/\$425
II	Turn table	1	Revox B 790 or equivalent	24.000\$00/\$200	24.000\$00/\$200
II	Stereo cassette tape deck	1	Revox Model B 710 or equiv.	36 contos/\$300	36 contos/\$300
II	Cabels and connectors for mini plug, phonoplug, cannouto phone plu.	1 ea.	SONY EC-10M, EC-10A and EC-6CA Z	1.200\$00/\$10	36.000\$00/\$30
II	Stereo headphones	1	SONY Model DR-57	5.500\$00/\$46	5.500\$00/\$46
II	Tape head degausser	1	R.B. Annis Company, Model ?	6.000\$00/\$50	6.000\$00/\$50
II	Tape splicer - cassett and open reel	1 ea.	Robbins ?	3.000\$00/\$25	3.000\$00/\$25

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## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

TV Equipment Storage  
and Workroom

SALA NO 14

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Library Shelving 1 Range, 2 units, 7 shelves	2	FOC	12 contos/\$100	24 contos/\$200
II	Study Table 80 x 80 x 70 Ait	3	FOC N/Ref. 43.07	5 contos/\$42	15 contos/\$125
II	Swivel chair	2	Longra Ref. 1.4.220	9 contos/\$75	18 contos/\$150
II	Steel storage cabinet 2 door 970 x 425 x 1950	1	FOC Ref. 01.82	20.110\$00/\$178	20.110\$00/\$178
II	Camera tripod with dolly	1	Davis and Sanford Co., Inc. Model: The Challenger with DG Tripod, H4 Head and W4 dolly	31.800\$00/\$265	31.800\$00/\$265
II	Video camera portable/convertable	1	Panasonic Model WV 3890B with 2 e NR- C-L5J batteries and DE-1232 battery charger	323.400\$00/\$2695	323.400\$00/\$2695
II	Portable video recorder		Panasonic Model NV-8420 with AC adapter WV-3203	125.400\$00/\$1045	125.400\$00/\$1045
II	VHS video recorder/player	1	Panasonic, Model NV-8200	186 contos/\$1550	186 contos/\$1550
II	VHS video player	1	Panasonic, Model NV-8170	150 contos/\$1250	150 contos/\$1250
II	Color monitor 10 inch	1	Panasonic, Model CT-110 MA	57 contos/\$475	57 contos/\$475
II	Color monitor 19 inches	1	Panasonic, Model CT-1920 M	77.400\$00/\$645	77.400\$00/\$645
II	Mobil TV table	1	Bretford, Model TS 54	19.200\$00/\$160	19.200\$00/\$160
II	Proj. screen 50 x 50 wall mount	1	Draper, Model V-Screen	4.200\$00/\$35	4.200\$00/\$35

## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR A-V Equipment  
StorageSALA NO 15

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
V	Desk 70 x 120	2	From S.D.		-0-
V	Table 60 x 70	1	From S.D.		-0-
V	Steel cabinet 2 doors 1.00 x 0.45 x 2.00 m	1	From S.D.		-0-
V	Double files 5 x 3 w/stand	3	From S.D.		-0-
V	Double files 6 x 4 w/stand	2	From S.D.		-0-
V	Double files 10 x 4 w/stand	2	From S.D.		-0-
I	2 Ranges shelving 3 units each 950 x 600 x 1950 w/7 shelves	6	FOC	12 contos/\$100	72 contos/\$600
I	1 Range shelving 1 unit each 950 x 600 x 1950 w/7 shelves	1	FOC	12 contos/\$100	12 contos/\$100
V	Chair	2	From S.D.		-0-
III	Slide/filmstrip projector	2	Rank Aldis Tutor 2 with carriers for slides, semi-automatic slides and filmstrips	30 contos/\$250	60 contos/\$500
III	Slide projector--remote control carousel type	5	Kodak Ektagraphic B-2AR w/70 to 120 zoom lens and case	54 contos/\$450	270 contos/\$2250
III	Extra lenses for Kodak Ektagraphic B-2AR	2	180 mm	7.200\$00/\$60	14.400\$00/\$120
		2	60 mm	6 contos/\$50	12 contos/\$100
		2	250 mm	9.600\$00/\$80	19.200\$00/\$160
	Overhead projector portable w/roll attachment	4	Elmo HP-A290	4.680\$00/\$390	187.200\$00/\$1560
III	Overhead projector	4	Beseler Porta Scribe G100LL	32.400\$00/\$270	129.600\$00/\$1080
III	16 mm sound motion picture projector, optical/magnetic	2	Elmo 16 CL optica/Magnetic	310.800\$00/\$2590	621.600\$00/\$5180
III	16 mm sound motion picture optical	2	Bell and Howell 2580A w/zoom lens attachment	148.080/\$1234	296.160\$00/\$2468

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## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

A-V Equipment  
SECTOR StorageSALA NO 15

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
III	Audio cassette recorder with slide synchronizer	4	Sharp RD 670 AV	30 contos/\$250	120 contos/\$1000
III	Record player 3 speed with speakers in lid	2	Califone International Model 1815 K 220V 50H <sub>2</sub> option	28.800\$00/\$240	57.600\$00/\$480
III	Projection stand w/5" wheels for overhead projector 39" high	10	Bretford OH 39	20.400\$00/\$170	204 contos/\$1700
	Projection stand w/5" wheels 42" high, 3 shelves	3	Bretford, Model 42	14.400\$00/\$120	43.200\$00/\$360
III	Projection stand, folding	2	Welt/Safe-Lock, Inc. Model 203.56	14.400\$00/\$120	28.800\$00/\$240
III	Audio cassette recorder	2	Sharp, Model RD 667 AV	14.400\$00/\$120	28.800\$00/\$240
II	Canister type vacuum cleaner with attachments	1		12 contos/\$100	12 contos/\$100
III	Projection screen -- tripod 1.5 m x 1.5 m	2	Da-lite Model -- picture king	18 contos/\$150	36 contos/\$300
III	Projection screen -- tripod 1.8 m x 1.8 m	2	Da-lite Model -- picture king	21 contos/\$175	42 contos/\$350
III	Portable PA system and lectern battery powered	2	Perma Power Electronics, Inc. Model Roving Rostrum S-122	49.800\$00/\$415	99.600\$00/\$830
III	Easel and flip chart	2	Avance Products Co., Inc. Model 1000-300	16.800\$00/\$140	36.600\$00/\$280
III	Slide dissolve control	1	Kodak Ektagraphic Programmable dissolve control	36 contos/\$525	36 contos/\$525

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PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
II	Built-in counter w/plastic laminate top	1	Local design and construction	36 contos/\$300	36 contos/\$300
III	Photo enlarger 35 mm (professional quality and features)	1		60 contos/\$500	60 contos/\$500
III	Photo timer	1		9 contos/\$75	9 contos/\$75
III	Print washer	1		24 contos/\$200	24 contos/\$200
III	Print dryer	1		48 contos/\$400	48 contos/\$400
	11" x 14" photo trays	4		2.400\$00/\$20	9.600\$00/\$80
	8" x 10" photo trays	4		1.350\$00/\$11.25	5.400\$00/\$45
III	5" x 7" photo trays	4		450\$00/\$7.50	1.800\$00/\$15
	Large darkroom safe lights w/yellow and red filters	3		2.400\$00/\$20	7.200\$00/\$60
III	Photo processor for Kodak Ektachrome w/nitrogen bottle and water filtering system	1		Wing-Lynch, Inc.	1080 contos/\$9000
III	Enlarging easel up to 11" x 14"	1		9.000\$00/\$75	9.000\$00/\$75

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
V	Desk 1200 x 700	2	From S.D.		-0-
II	Swivel chair w/wheels	2	Longra Ref. 1.4.220	9 contos/\$75	18 contos/\$150
II	Steel storage cabinet 2 door 970 x 425 x 1950 +	1	From S.D.		-0-
III	Copy stand with lights and base	1	Matrix Div./Leedal Inc. Model RS-2 reprostand with Model TT 202 floor stand and ML 200/2 fluoresecent top lighting	186 contos/\$1550	186 contos/\$1550
III	Slide duplicator with spare lamp, spare parts kit and extra 100 foot magazine		Forox, Model SDD2	1332 contos/ \$11,100	1332 contos/ \$11,100
	55 mm SLR camera with 3 lenses and accessories	1	Nikon FM2 Camera Body Vivitar lenses  55 mm f2.8 Macro Series 1 24-48 f3.8 zoom Series 1 70-210 f3.5 zoom Multiplicadores de focal 2 x	36 contos/\$300  \$150 \$250 \$250 \$ 50	36 contos/\$300
				120 contos/\$1000	120 contos/\$1000
III	Photo flash automatic - Thyristor with mounting brackfet, Ni cad batteries and battery charger	1	Sun pack auto zoom 5000	18 contos/\$150	18 contos/\$150
III	Slide mounter	1	Byers Photo Equipment	240 contos/\$2000	240 contos/\$2000
III	Camera tripod	1	Davis and Sanford Co., Inc. Model RTSP with tilt/pan head and geared center post	18 contos/\$150	18 contos/\$150

## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR AV/TV Workroom  
Lab

SALA NO 18

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
II	Tables Trapezoidal 116 cm base x 52 cm x 70 Ait	6	FOC N/Ref. 28.12	7.820\$00/\$65	46.920\$00/\$390
II	Chair	12	Longra Ref. 1.7.440	3.663\$00/\$30	43.956\$00/336
IV	Halogen light kit	1	FOBA-HARKO or Smith-Victor 1800 watt kit	36 contos/\$300	36 contos/\$300
IV	Combi-Tube-System with carry- ing case	1	FOBA	24 contos/\$200	24 contos/\$200
II	Overhead projector with roll attachment	1	Beseler Porta Scribe G-100LL	32.400\$00/\$270	32.400\$00/270
II	Transparency Maker (Thermal) (Heat transfer copier)	1	3M Co., A-V Div., Model 4500 or 45FGA	96 contos/\$800	96 contos/\$800
III	Dry mounting and laminating press	1	Seal Products, Inc., Model Jumbo 160 (220V, 50H <sub>2</sub> )	70.200\$00/\$585	70.200\$00/\$585
III	Tacking iron	1	Seal Products, Inc.	2.400\$00/\$20	2.400\$00/\$20
II	Work table 1200 x 800 x 720 Ait	4	Longra Ref. 3.7.351	5.421\$00/\$45	21.684\$00/\$180
II	Paper trimming board 60 x 60 cm or larger	1		15 contos/\$125	15 contos/\$125
IV	Deluxe label tool and tape kit for 3/8" and 1/2" tape with 3 embossing wheels in carrying case	1	Dymo Deluxe label and tool kit	7.200\$00/\$60	7.200\$00/\$60
III	WRICO Sign Maker Kit with 13 letter guides for 5 sizes of letters guide bar and 3 pens	1	Wood Regan Instrument Co.	13.200\$00/\$110	13.200\$00/\$110

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CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR AV/TV Workroom  
and Lab

SALA NO 18

PRIORIDADE	DESCRICA0	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
IV	Die cutting lettering machine with 1-1/4", 1" and 1/2" letters UC and LC numbers and tapes		Letteron	114 contos/\$950	114 contos/\$950
II	Projection Screen 70" x 70"	1	Draper Shade and Screen Co. Model V-Screen	6.600\$00/\$55	6.600\$00/\$55
II	Slide viewer and editor	1	Knox Mfg.Co., Model 6000	28.800\$00/\$240	28.800\$00/\$240
III	Transparency viewer and light box	1	Knox Mfg. Co., Model 6009	12 contos/\$100	12 contos/\$100
II	Vertical file 4 drawer 75 x 45	2		20 contos/\$167	40 contos/\$333
II	Storage cabinet (for AV materials) (could go to library?)	2	FOC Ref. 01 41 w/one 46.80, two 46.77 and four 46.78 shelves, 24 ea. 46.43 files and 400 hanging folders (this needs to be checked with FOC)	62.710\$00/\$522	125.420\$00/\$522

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## CENTRO DE RECURSOS - LISTA DE EQUIPAMENTO

SECTOR Printing ServicesSALA NO Printing Services

PRIORIDADE	DESCRICAO	NO UNIDADES	FABRICANTE/MARCA/MOD./NO	CUSTO PROVAVEL	
				UNITARIO	TOTAL
I	Paper trimmer	1	Polar 76, Model SD-EM or ITOH-72, Model ST	+ 1.400 contos + 1.500 contos	1.500 contos/ \$11,700
I	Offset press Precision counting display, perforation device	1	Heidelberg, Model GTO-52	+ 4.000 contos	4.000 contos/ \$33,300
III	Binding machine maj uina colar e encapar sizes 15-3/4" x 10-5/8" x 1-1/2" 4-3/4" x 3-3/4" x 1/8"	1	Muller Martini, Model Baby Pony	+ 3.000 contos	3.000 contos/ \$25,000
II	Stapler Agrafador (grandes volumes)	1	Bardolet, Model C-25	+ 400 contos	400 contos/\$3300
IV	Folding Machine	1	SHOEI, Model SPK 80 KLL or MATHIAS BAVERLE	+ 2.500 contos + 800 contos	2.500 contos/ \$20,800
I	Plate maker	1	Dupliphot (Agfa-Gevaert) Model HS	+ 350 contos	350 contos/\$2900

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Computer Capability for the T/LRC

There are a number of in-house, backroom activities that could be done more efficiently by computer than could be done manually. These are house keeping tasks such as periodicals management, inventory of T/LRC equipment and materials, a library materials outstanding order file, T/LRC use statistics, etc.

As an example, using a simple data management program the title, publisher, vendor, subscription cost, departmental attribution, and current holdings of each periodical and serial title could easily be recorded and used to produce a union list of titles showing holdings which could be reproduced periodically and made available to the departments as well as the library. The computer file could replace the manual cardex file used to record receipts and could be used to assist in the renewal of subscriptions process. It could also provide each department with a list of titles attributed to the department as well as other useful management data such as inflation rate change. The computer could also be used for text editing in the publications areas.

This work could be accomplished on a shared computer network operated on the campus or by a 48 K Apple type micro computer with dual disk drives, a monitor and a printer. Three programs would be required; a data base management program similar to PFS, a report writing program similar to PFS Reports, and a text editing program. If microcomputers were to be used, there should be two to provide reliability through backup although both would be used daily. A shared computer with routine maintenance should also be able to provide reliability through a regular preventive maintenance program.

It is recommended that the T/LRC start with in-office programs as outlined above and not attempt to go on-line with a public catalog until the librarian and library staff fully understand what is required to mount an on-line catalog. It would require a considerably larger and more expensive computer than the present Wang, even with the proposed enhancements, to support an on-line catalog.

The plan suggested here would be: that the T/LRC share the capability of the present Wang computer with enhancements, that commercial programs be purchased to provide data management and word or text processing, that the T/LRC staff do not become involved in writing computer programs but

rather be users of other programs, that the T/LRC have two terminals for library processing and text editing, that T/LRC funds for computer enhancement not be taken off-the-top but that computer enhancement be considered along with all of the other needs of the T/LRC for equipment at this time.

#### Ordering Furniture, Audio-Visual and Other Equipment

All items marked "from SD" in the manufacturer column are pieces of equipment that will be moved from the current Documentation Center to the new T/LRC.

No manufacturer is shown for some items; for example, vertical files--4 drawer. Purchasing should select which ever brand is a good buy for these standard items.

Where a specific model and/or brand is shown, the Purchasing Department may choose to obtain a quote for other models or brands but should check with the Head of the T/LRC or the Head of the Documentation Center or D. Moses before placing the order. If a 110 volt model is listed, a 220 volt, 50Hz model must be purchased.

Purchasing should send out requests for quotes on all items as soon as possible in an effort to know how much of the priority list can be purchased. The more quotes available at the time actual ordering begins the better.

If desks and chairs for office areas, vertical files, steel cabinets and tables can be found in the University surplus equipment pool, these items need not be purchased.

Library shelving, library chairs, study tables, tables, study carrels, and other furniture in Rooms 1, 2, 3 and 18 should be new and give a coordinated appearance. A coordinated appearance throughout the entire T/LRC would be nice but is most important in these areas.

## LIBRARY MATERIALS

The recommendations and comments in this section pertain to library materials and audio-visual software. As in other sections, they are presented at random and not in order of priority.

1. The classification system currently in use is a cataloging system adapted from a Brazilian system developed primarily for agriculture. Even with the modifications that have been made to the system, it appears to be too narrow to accommodate a university library. A high priority task for the new Chief of Library Services should be to evaluate this system, compare it to the systems used at Covilha and Evora and with the Thesoures UNESCO/BIE (Bureau of International Education) indexing system for books and magazines. If there is to be a change in classification systems, it should be made as soon as possible to reduce the number of titles that must be changed.
2. A catalog of library materials held in the T/LRC must be made readily available to staff, students and others coming into the library.
3. Each title in the library collection should be assigned a unique catalog number and all copies of the same title should use the same catalog number. This will prove to be most useful when it comes time to automate circulation or to generate computer catalogs. It will assist immediately in identifying borrowed items.
4. Departments need to provide the library with a list of required text books. This list should be kept current by course number and available in the library. Instructors need to provide the library with lists of assigned readings for each class in advance of the assignment.
5. Each journal title should be attributed to one department or office. This will allow evaluation of library materials costs by departments and provide rapid subject specialist input whenever a title(s) needs to be evaluated for renewal or other purposes.

6. Each department should be allocated a percentage of the library budget (stated in escudos) for the purchase of books each year. The allocation should be based on publishing in the fields, number of staff and students involved in each department's courses, new programs in the departments, etc. This formula should be developed by the Head of the T/LRC and the Chief of Library Services. The library should also have a percentage of the budget to acquire needed reference books and items not picked up by the departments that students need. This would have the effect of placing the selection of books into the hands of the teaching and research staff.
7. A professional collection of education books and journals should be established for use by the teaching staff in keeping up with trends and methods of teaching. Ideally, this collection would be in a teacher's lounge but no location for such a facility has been identified.
8. Students would like to see more practical books in the library. They would also like longer library hours. The library should be open when students are not in class to provide time to study and do research.
9. Reference tools like Biology Abstracts and Chemical Abstracts are very expensive. The library should have a fund from which it can request computer searches for all classes of patrons; teachers, researchers and students.
10. Back runs of journals should be bound to improve access and conserve storage space.
11. A search should be made for foreign motion pictures on appropriate subjects for class use that can be purchased with a half magnetic track so a Portuguese sound track can be added locally.
12. Library funds should be used to acquire audio-visual materials as well as print materials. One method of buying materials that will be used is to cost-share the price of audio-visual materials between the library budget and the budget of the department who wishes to use the material.
13. There is a great tendency for teachers, researchers and administrators to request photo copies of printed materials that are of interest to themselves, their students and their colleagues. One role of the Chief Librarian

and the Head of the T/LRC will be to educate all users of printed material on the copyright laws that govern the copying or duplicating of both print and non-print materials. This is a particularly difficult problem as the technology to copy materials far exceeds the average person's knowledge of the copyright laws. There is also a mistaken notion that any copying done in the name of education or not-for-profit is acceptable. By law, this is not the case.

Neither IUTAD, nor any other university, wants to be taken to court for copyright infringement. The Head of the T/LRC and the Chief Librarian should provide instruction to all T/LRC staff who deal with users of T/LRC services in the basic provisions of the copyright laws and how to refer problem cases to a higher authority when requests for duplication seem to be cases of infringement.

14. A collection development policy should be prepared to provide statements reflecting the information needs of IUTAD and the community and regional service activities in which it is involved. This policy should be a guide in choosing materials for the library collection and assist in planning and reviewing the development of the collection. It will also serve to inform staff, students and others of the nature of the collection. This collection development policy would define the scope of the collection and specify the degree of coverage for each subject area and the depth of coverage of that area. This policy should be developed after answering the question of what classification system will be used.

The following information from the National Agricultural Library (NAL), U.S. Department of Agriculture, can serve as a guide for the preparation of a library collection development policy, however, it should be kept in mind that the NAL is not as comprehensive a library from the standpoint of subject coverage as a university library. The IUTAD library is also collecting in all formats, print, microform, audio-visual, etc.

## Core Subjects

NAL specializes in information on agriculture and related subjects as indicated below.

The core subjects of the collection in which the Library has consistently made strenuous efforts to collect comprehensively are summarized as follows:

## Agriculture (general)

Economic, historical, technical, commercial, sociological, legal, financial, educational, biographical, and other aspects.

Agricultural societies, organizations, cooperatives, etc.

## Animal Science

Animal husbandry, entomology, veterinary science, economic zoology, and zoology of domestic animals.

## Plant Science

Economic and general botany, plant culture, field crops, forest botany and forest crops, horticultural crops (including fruits, vegetables, ornamentals), plant pathology, weeds, etc.

## Agricultural Chemistry

Chemical pollution, pesticides.

## Agricultural Engineering

Farm structures, farm machinery, rural electrification, irrigation, drainage, water supply, flood control.

Soils, fertilizers, and soil conservation.

Forestry and utilization and technology of raw forest products.

Agricultural products, including industrial uses.

Rural sociology and rural life.

## Agricultural Economics

Marketing, finance, labor, land, farm management, farm and crop insurance, etc.

## Agricultural Statistics

Production, trade, consumption of agricultural and forest products, prices, etc.

Food and Nutrition.

## Related Subjects

To support the research and program needs of the Department, the Library collects substantial materials in subjects such as chemistry, physics, biology, natural history, wildlife, ecology and pollution, genetics, natural resources, meteorology, fisheries, and economics. The Library also collects books and journals in such subjects as management science and computer technology to assist Department staff.

**Types of Material** The collection is generally limited to printed materials or reproductions of printed materials. Certain bibliographic resources are available through computerized on-line services, which are not incorporated into the NAL collection.

Audio-visuals. Audio-visual materials are generally not collected. Exceptions may be made for such items as phonograph records and films or slides which accompany books and are essential to the understanding of research accomplishments.

Bibliographic variants. When a book is published simultaneously in two or more places from the same plates, but with different imprints, such as in British, Canadian, and American works, the Library will not attempt to acquire more than a single imprint.

Dissertations. Doctoral dissertations available from University Microfilms are ordered only when requested. All other doctoral dissertations are acquired when in scope. Masters thesis are acquired when requested. Any thesis is acquired when written by USDA staff or in cooperation with the USDA.

Legal Materials. With a few exceptions, the Beltsville Library limits its acquisition of legal materials to unofficial texts and secondary material on legislation and judicial decision, e.g., History of the Food and Drug Act, Agricultural Legislation in the United States, History of Land Laws in Great Britain, and to compilations of laws devoted to agricultural subjects. Domestic laws (Federal and State) as well as similar domestic legal materials required by the Department's legal officers are the responsibility of the Law Branch. Briefs, testimonies, petitions, etc., issued by the Department of Agriculture are filed in the Office of the General Counsel. These are not normally duplicated in the Library. Foreign laws and the instruments to implement the law, such as the statutory instruments of Great Britain, official gazettes, etc., are included in the Library of Congress collection and are not duplicated in the Library.

4. The USDA Office of Communication prepares and makes available for purchase by the public slides and filmstrips relating to agriculture.

Some motion pictures produced by USDA are available from the National Audio-Visual Center, Washington, D.C. 20904.

Manuscripts. Manuscripts are accepted when of substantial interest and within scope.

Maps. Maps are collected according to their subjects, e.g., agricultural maps are within comprehensive scope.

Microforms. Microform materials are acquired particularly for large sets of documents when many of the titles are of interest to Library users, or when many of the titles are of interest to Library users, or when acquisition of the whole set is the most practical way to obtain the titles of interest, or when such acquisition assures more complete coverage. Examples of such sets are the documents and official records of the United Nations; selected reports in the Library's areas of interest issued by the National Technical Information Service; and all FAO documents cited in FAO Documentation-Current Bibliography. The Library is also acquiring, through a national program it is sponsoring, microfilm copies of state land-grant agricultural publications. Microforms may be acquired to provide additional copies of much used periodicals, or of important materials which are damaged or deteriorating, to provide issues of journals not available in hard copy, or when it appears practical to acquire only microform copies of a periodical not highly used. Single monographs are obtained in microform when it is the only format in which they are made available.

Newspapers. Newspapers are collected if of substantial or historical interest in the areas of agriculture.

Patents. Patents, except for plant patents (see SB 123.5 in scope statements), are acquired for the user only when requested.

Printouts from computerized data bases. The Library does not collect printouts produced for individuals or public use.

Rare books. Rare or historical books or magazines are acquired when of substantial interest and within scope. Early writings are often essential, such as those on horticulture, plant or insect systematics, and travels of early naturalists.

Reprints. The Library collects reprints of articles written by USDA authors; other reprints are collected only when representing material not available in the Library in other form. However, reprints issued in their own numbered series are admitted if these series are listed as such in the Union List of Serials or otherwise indexed in their own right. Reprints representing information not in the Library in other form are evaluated with the same criteria that govern selection of all materials. If they are substantive and within scope, they are collected.

Translations. Translations from a foreign language into English and from an unfamiliar to a familiar language (e.g., Arabic to French) are acquired. Translations from English to a foreign language, or from one foreign language to another of similar difficulty, are admitted to the collection only on the basis of special consideration such as reference use, classic stature of the work, authorship, or special historical significance.

Exclusions. Generally excluded from the collection are:

- Clipping services
- County farm bureau newspapers
- Fiction and other forms of imaginative literature
- Forms, form letters, etc.
- Juvenile literature
- Press releases
- Radio and television scripts
- USDA agency administrative or operating documents and records.<sup>5</sup>

#### Format of Scope Statement

The basic statement of the collection policy is expressed in terms of subject fields as given in the Library of Congress classification schedules and is arranged by the classification numbers from the schedules. For each subject a code is given to indicate the level of collecting intensity, e.g.:

(Class no.)	(Subject)	(Collecting Intensity)
SB 183-317	Field crops	Com

5. Some archival documents and agency records, such as those of the USDA Graduate School and the Office of Audit, are housed in NAL stacks, but are not considered as part of the NAL collection.

The five levels of collecting intensity are:

1. Comprehensive level (code-Com): A collection in which a library endeavors to include all significant works in any language, for a necessarily defined and limited field. The aim, if not the achievement, is exhaustiveness. Materials of very brief or trivial interest, such as commercial promotional literature, notices or society newsletters reporting doings of members, may be excluded.
2. Research level (code-Res): A collection which includes the major source materials required for independent research, including materials in any language containing research reporting, new findings, scientific experimental results, and other information useful to researchers. It also includes all important reference works and a wide selection of specialized monographs, as well as a very extensive collection of journals and major indexing and abstracting services in the field.
3. Study level (code-Study): A collection which is adequate to support sustained independent study; that is, which is adequate to maintain knowledge of a subject required for limited or generalized purposes, of less than research intensity. It includes a wide range of basic monographs, a selection of representative journals, and the reference tools and fundamental bibliographical apparatus pertaining to the subject. It is generally limited to more commonly known languages.
4. Basic level (code-Basic): A highly selective collection which serves to introduce and define the subject and to indicate the varieties of information available elsewhere. It includes major dictionaries and encyclopedias, selected editions of important works, and historical major periodicals in the field. It is generally limited to the English language.
5. Minimal level (code-Min): A subject area which is merely recognized in which few selections are made beyond very fundamental reference tools.

T/LRC PROCEDURES AND PHILOSOPHY

1. The Teaching/Learning Resources Center (T/LRC) is a service department of the University and as such should always try to respond to the requests of users with positive actions. A teacher's request to provide information to students in a non-traditional way should be viewed by the T/LRC staff as an opportunity to take part in an educational experiment rather than a nuisance to be put aside as quickly as possible. There are, of course, legitimate reasons for turning down a patron's request for service, but even when a T/LRC staff member must say no to a request because of T/LRC operating instructions, that individual should also be told the name of the next higher person of authority who might, upon hearing the details of the request, choose to make an exception to the rules.
2. The T/LRC staff cannot anticipate all of the ways in which patrons might use T/LRC facilities and services and should always be ready and willing to follow up on suggestions made by students, teachers, researchers, administrators and others. The T/LRC staff should also be creative in developing new uses of facilities and encourage patrons to use services which may be new to them.
3. In-house use of T/LRC facilities and services which do not create additional costs to the T/LRC should be available to anyone who enters the T/LRC.
4. If additional costs, usually for production, are to be incurred to fill a patrons request, approval from the appropriate authority should be received before work/production begins. In some cases a good deal of planning will take place before a request to approve funding can be made.
5. It is recommended that the T/LRC do production only for teaching and research departments and administrative offices of the University. Outside agencies and organizations should have the sponsorship of one of the University departments. This will have several advantages including having the name of the University appear on all materials printed or produced, it will insure involvement of subject matter experts where

necessary, increase the involvement of the University in outside activities and will keep the T/LRC from becoming more involved with outside jobs rather than working for the departments. If there is no department or office of the University willing to cooperate with the outside organization, there would be some question as to whether the University should be involved at all. It may be desirable to establish direct access to T/LRC services for certain DRTM activities but their work should have little trouble finding departmental sponsorship, and departmental involvement would help keep teachers and researchers informed of DRTM activities.

6. The information and study needs of students should have a strong influence on the development of library services.
7. The library should develop brochures which will help patrons find materials in the library. Other brochures could be printed that would help students do research in the library and to write research papers.
8. It is more important to have library materials used than to protect them to prevent all loss. The library should expect to have some items missing each year. Reasonable balance must be achieved between loss and protection. An easy-to-use check out system needs to be developed that will show a certain amount of trust and responsibility on the parts of the library and students respectively.
9. A University identification card or the Portuguese identification card should be the only forms of identification required to check out circulating material from the library.
10. A book card system is recommended as the charging system used by the library. Each volume should have a book pocket to hold the matching book card while the item is in the library. When the item is checked out the book card, showing the identification of the borrower, should be filed at the circulation desk until the item is returned.
11. A system for contacting people who have overdue items needs to be developed. These procedures need to be well documented and followed with preciseness.

12. The orientation program for new staff and students should include information on how to use T/LRC services. It cannot be assumed they will know how.
13. There should be a brochure available, without asking, that explains the services of and the procedures to use the T/LRC. It should be in sufficient detail that people know what to expect when requesting standard services.
14. The lending of library materials by mail should be investigated. Return of borrowed materials by mail might be particularly useful to patrons from other areas.
15. The circulation of completed audio-visual materials should be handled by the Library Services Section. It may not be possible to start this way but it should be a goal.
16. T/LRC staff should be involved in some form of staff training on an almost continual basis. This is the responsibility of the Head of the T/LRC and the three section heads. Training should include technical training, University orientation, departmental orientation, basic communication, regional orientation and cross-training.
17. A system for scheduling audio-visual equipment and projection services in advance of need should be developed and documented.
18. All procedures used by the T/LRC should be documented and not changed without also changing the documentation.
19. A list of standard printing services should be published along with the procedures for having printing work done.
20. The T/LRC should standardize on certain models and brands of audio-visual equipment to reduce the spare parts inventory and the problems connected with maintenance and repair.
21. The T/LRC Audio-Visual Services Section should review all requests for the purchase of audio-visual equipment received by the Purchasing Department and advise the Purchasing Department on models, brands, accessories and maintenance of equipment requested.

22. The Audio-Visual Services Section should keep records on spare parts, projection lamps, production materials and maintenance performed. This information will then be used to help plan for the next year and to indicate which pieces of equipment should be kept, traded, sold or junked. Inventories should also be kept on office supplies used by T/LRC.
23. Meetings involving people from outside the T/LRC should be held as necessary, with the T/LRC Advisory Committee and the T/LRC Administrative Committee being the only regularly scheduled meetings. (See Appendix A.) Special meetings with teachers, researchers and other user groups of the T/LRC should be held whenever a better understanding of the services available from the T/LRC or a better understanding of the needs of the customer will result. All meetings should have specific goals stated in advance of the meeting.
24. An inventory should be made of all audio-visual equipment owned by the University regardless of which department has it. This list is important for the T/LRC to plan maintenance and lamp replacement.
25. An inventory of audio-visual materials should be made so there is no duplication between departments and so all departments can use these materials that were purchased with University funds.
26. An investigation should be made of the effect for the University of moving the design function in the Geoscience Department to the T/LRC and, if not moved, what the relationship will be between that design function and the T/LRC.
27. The process of materials ordering needs to be reviewed with an eye toward speeding up the process from request to receipt of the item. Communicating reasons for delays would also be helpful.
28. New acquisitions need to be publicized through a new books list or other format independently of other news about the University which is included in the currently published "Boletim Informativo."
29. Teachers and researchers need to be requested frequently to submit their information needs to the T/LRC where catalogs can be searched for them.

## MISCELLANEOUS OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

During the course of the many interviews and casual discussions with staff members, students and others, a number of comments were received which did not necessarily pertain directly to the T/LRC but were considered of sufficient interest to record here for review by the administration of the University. There is no significance to the order of these comments and most contain value judgments by one or both authors of this report.

1. Every person working for or attending the Institute should have some idea of what the Institute is attempting to accomplish and how important their individual roles are in achieving these goals. Well informed faculty, students and staff can be of great value in extending an awareness and appreciation of IUTAD's mission and achievements through interpersonal contacts, both formal and informal. A conscious effort should be made to keep Institute people well informed about the goals of the Institute because this will help develop unity and esprit de corps which will strengthen a support base for Institute activities.
2. There needs to be a staff roster that will help visitors to the campus identify staff members and their work by department. A campus map showing building locations would also be useful.
3. Students could have input to the faculty through some form of teacher evaluation. This activity should be voluntary on the part of the teachers and could provide important feedback to them on how effective their teaching methods are.
4. A number of teachers commented that students do not know how to write. Basic communication courses in both writing and speaking would be useful in helping to produce articulate graduates. Faculty should be obtained to teach technical report writing and oral presentations.
5. There is a need to take students on field trips for first-hand observations in some courses. There seem to be two problems in this area: one is the difficulty in making arrangements for transportation, and the other

is the lack of cooperation from other teachers in obtaining the students' release from their classes for the day of the field trip. The first could be helped by issuing guidelines for arranging transportation for field trips. The second is more difficult to correct as it requires changing attitudes.

6. New staff members need an orientation program that will acquaint them with the goals of the University, procedures used to obtain various campus services and information about the community. Assume nothing.
7. Teachers indicate that they are overloaded with classes. (We did not find out what a normal teaching load is or learn the size of the load carried by those indicating they were overloaded.)
8. Teachers feel they need a place where they can talk informally together. A teachers' lounge with professional reading material would be a good addition to the campus.
9. Students feel they have little time to study due to the number of hours spent in class. (No details were checked.) They would like longer library hours as a place to study.
10. There was interest among teachers and researchers to know what is about to happen at the University--a posted daily or weekly schedule of events. Most would find news of coming events more interesting than news of past events.
11. An automatic telephone system serving all locations of the University is badly needed to improve internal communications.
12. A dependable, twice-daily internal mail pick-up and delivery to all departmental and administrative offices would improve communications a great deal.
13. IUTAD should develop and maintain systems and practices for improved two-way communications between administration and faculty, research/teaching assistants, students and clerical and service support staff.
14. The team suggests that interested faculty, students and Institute graduates might form an alumni association. Goals of such a group could

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include community support, legislative support and private financial support for IUTAD projects and growth or development.

15. There seems to be a lack of intermediate personnel to assist in carrying out duties. (Lab assistants and secretaries.)

16. Many people expressed a need for improved access to photocopy equipment.

17. When staff members and graduate students return from working in other countries they should give a report to colleagues in a seminar on the professional and cultural experiences they have had.

18. Students are on vacation during harvest time when they should be gaining practical field experience. Some form of University credit might bring some students back to help in the University's vineyards and fields or they could work in other locations as interns.

19. There was some interest in trying to achieve a better balance of courses in basic math, chemistry and physics and in applied technical fields of plant, animal and agricultural engineering.

20. Students indicate that they would like more practical classes and more practical books in the library.

## RECOMMENDATIONS ON TIMING AND PRIORITIES

To bring the Teaching/Learning Resource Center into reality, several tasks need to be completed. Some will need to be done quite soon if the T/LRC is to be operational when classes start in the fall of 1984. Appendix G outlines many of these tasks in four priority categories.

In general, considerations for staffing should come before considerations for equipment, although staff-related tasks and equipment and facilities related to tasks are included in each category.

As stated elsewhere in this report, the one-time monies available for equipment currently on hand cannot be expected to completely establish the T/LRC, let alone sustain it over the years. The equipment listed in Appendix C is estimated at about 25 percent more than the one-time funds available. It will be necessary for the administration to find the additional funds needed to open the Center and to budget for the annual maintenance of the T/LRC program.

If the decision is to centralize the library collections and services and to provide a useful level of audio-visual production to support both campus and extension activities, then the following activities should be taken as soon as possible.

### Tasks for Immediate Action

1. Hire a Head of the Teaching/Learning Resource Center. Develop a search strategy and attempt to have this position filled as early in 1984 as possible so that this person can do the planning for the establishment of the T/LRC. (See Appendix A-1)
2. Hire a Chief of Library Services. Develop a search strategy and attempt to have this position filled as quickly as the Head of the T/LRC can provide input to the selection process. (See Appendix A-2)

3. Hire a Chief of Audio-Visual Services. Develop a search strategy and attempt to have this position filled as quickly as the Head of the T/LRC can provide input to the selection process. (See Appendix A-3)
4. Purchase Priority I items listed in Appendix C as soon as possible. These items are essential to the operation of the T/LRC.
5. Develop a plan for funding the T/LRC (see General Recommendations, items 13-16).
6. Develop plans to remodel Building No. 2 as soon as it can be vacated. This work will need to be completed as far as possible in advance of the anticipated opening of the T/LRC to allow time to move in equipment and materials and to establish work patterns in the new facility. (See Appendix B)
7. Develop a plan to move into the new T/LRC facilities. The installation of new equipment, existing equipment and staff will require the coordination of many people. A well thought out time schedule that can be met is important. It is better to plan a slow move that may naturally speed up than get behind in an overly ambitious plan. The actual move of existing equipment, materials and staff should not take more than 10 - 15 working days. This could be accomplished in five days with proper planning for trucks and support personnel.
8. Develop plans to collect and merge library materials from the departments with those from the Documentation Service. This should be a first priority job for the Chief of Library Services.
9. Duplicate the card catalog and file the copy as a public union catalog in Room 1B. This should be a first priority task for the Chief of Library Services (see Appendix D-1).
10. Integrate the Head of the T/LRC, the Chief of Library Services and the Chief of Audio-Visual Services into the operation of the Documentation Service as soon as possible after they join the staff. This will allow these people, along with the Chief of Printing Services, to start functioning as the operational management team of the T/LRC.

11. The present Head of the Documentation Service should remain available as a consultant to the Head of the T/LRC as long as necessary to ensure a smooth transfer of leadership.
12. A Chief of Printing Services should be named when the Chiefs of Library Service and Audio-Visual Services are hired. (See Appendix A-4)
13. Hire a communications specialist/editor. This search can be carried out by the Head of the T/LRC. An attempt should be made to fill this position prior to the opening of the T/LRC. (See Appendix A-2 and General Recommendations, item 16)
14. Set up a plan with the Purchasing Department to control the acquisition of audio-visual equipment. (See Appendix E, items 20 to 22 and 25)
15. Develop a public relations and information plan for both internal and external communications. This should be an early job for the Editor. (See Appendix F, items 1, 6, 10 to 14 and 17)

Proceed on These Tasks as Soon as the  
Head of the T/LRC is in Place

16. Purchase equipment listed as Priority II and III in Appendix C.
17. Set up a method to record procedures used in the T/LRC (see Appendix E, item 18).
18. Investigate the suitability of the current classification system used for library materials in the Documentation Service. This should be a high priority task for the Chief of Library Services. (See Appendix D, items 1 and 3)
19. Write a mission statement and structure for the T/LRC Administrative Committee. (See Appendix A-6)
20. Write a job description and method of appointment for Departmental Representatives to the T/LRC. (See Appendix A-5 and E, item 23)

21. Write a mission statement and structure for the T/LRC Advisory Committee. (See Appendix A-4 and E, item 23)
22. Prepare documents outlining the scope of the T/LRC and each of its parts. Keep in mind that these documents should change as the role of the T/LRC changes over the years. (See General Recommendations 6 to 12 and 18 to 20)
23. Determine and document the priorities for serving non-university agencies. (See General Recommendations, item 3)

Proceed to Accomplish These Tasks by the  
T/LRC Opening Date

24. Improve access to photocopy equipment. Although a public use photocopy machine is not listed in Appendix C, it should be considered as a priority IV equipment purchase. (See Appendix F, item 16)
25. Set up and document procedures to approve expenditures for audio-visual and print productions. (See Appendix E, item 4)
26. Set up and document a production priority schedule. (See Appendix E, item 5)
27. Develop promotional material that will help students, staff and outside agencies and individuals learn to use the facilities of the T/LRC. (See Appendix E, items 7, 13 and 19)
28. Set up and document procedures for identification of patrons who wish to take materials out of the library. Try to set up a system that will not require identification for use of materials within the library. (See Appendix E, item 9)
29. Set up and document procedures to check an item out of the library, keep track of where it is (who has it), and how to communicate with patrons who do not return materials on time. (See Appendix E, items 10, 11, 14 and 15)

30. Develop a general plan for T/LRC staff training. Plans for specific training should be developed as needed. (See Appendix E, item 16)
31. Set up and document procedures for scheduling audio-visual materials and services. (See Appendix E, item 17)
32. Investigate the copyright laws and write a policy for photocopying which will allow the greatest amount of copying without infringing on the rights of the copyright holder. (See Appendix D, item 13)
33. Develop a plan to start binding journals and to bind back issues as funds permit. (See Appendix D, item 10)
34. Develop a plan to improve the University community's awareness of the mission and plans of the University. At this time, particularly that of the new T/LRC. (See General Recommendations, item 17)

Proceed to Implement as Soon as Possible After the  
Opening of the T/LRC

35. Purchase equipment listed as priority IV in Appendix C.
  36. Review and modify library acquisitions procedures as needed. (See Appendix E, items 27 to 29)
  37. Plan an orientation program for new staff so that they will know how to use the T/LRC and how it can help them. (See Appendix E, items 12, 13 and 19 and F, item 6)
  38. Hire an Audio-Visual Equipment Repairman to maintain the growing collection of A-V equipment on the campus. (See Appendix A-3)
  39. Investigate the possibility of incorporating the design facilities of the Geoscience Department into the T/LRC. (See Appendix E, item 26)
  40. Set up procedures that will assist staff members in arranging field trips. (See Appendix F, item 5)
  41. Investigate the possibility of using on-line data searching as an alternative to subscribing to such reference tools as Biological Abstracts and Chemical Abstracts.
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42. Set up procedures for the replacement of lost library materials.  
(See Appendix E, item 8)
43. Investigate the desirability of a national or regional educational telecommunications network. (See General Recommendations, item 21 and Appendix I)
44. Investigate the need for a communication course for all students.  
(See Appendix F-4)
45. Write a library collection development policy for IUTAD. (See Appendix D, item 14 and following examples)
46. Acquire and make available a collection of professional education materials for faculty use. (See Appendix D, item 7)
47. Investigate the usefulness of setting up informal or formal procedures to obtain copies of printed materials from the Gulbenkian Institute of Science for use at IUTAD.

## PROJECT PROCEDURES AND MATERIALS USED

This project was divided into two distinct parts. The first phase, during the first three weeks, was used to collect information concerning the need for enhanced library and audio-visual services and discussing basic and some specific communications theories and possibilities. The second phase, the last five weeks, was spent in gathering specific space and equipment inventories of the current Documentation Center and developing plans to expand the Documentation Center into a Teaching/Learning Resource Center (T/LRC).

During phase one, which actually started at Purdue University two or three weeks prior to the team's arrival in Portugal, contacts were made with the following individuals to gather information relevant to the development of the T/LRC:

- Dr. D. Woods Thomas, Director, International Programs in Agriculture, Purdue University
- Dr. James L. Collom, Associate Director, International Programs in Agriculture, Purdue University
- Vivian Rider, Administrative Assistant, International Programs in Agriculture, Purdue University
- Prof. Doutor Fernando Real, Reitor, IUTAD
- Prof. A. R. Allen, Veterinary Medical Illustration Facilities, Purdue
- Mr. M. M. Kerper, Audio-Visual Production Facilities, Purdue
- Prof. V. E. Neie, Teacher's Workshop, Physics Department, Purdue
- Prof. R. N. Hurst, Audio-Tutorial Laboratory, Biology Department, Purdue
- Prof. H. J. Griffith, Head of Continuing Education Division, Purdue
- Prof. and Mrs. James Ahlrichs, Agronomy Department, Purdue, (previous IUTAD long-term advisor)
- Prof. John Foley, Extension Administration, Purdue (previous IUTAD long-term advisor)
- Mr. Charles Buchanan, USAID Project Director, Lisbon
- Eng.<sup>o</sup> Antonio Machado, IUTAD
- Dr. Jose Torres Pereira, Biology Department, IUTAD
- Eng.<sup>o</sup> Jose M. de Aguiar Macedo, Head of the Documentation Center, IUTAD
- Prof. Doutor Lima Pereira, Vice-Reitor, IUTAD
- Antonio Joaquim A. Duarte, DRIM

- Alvaro Luis L. de Sousa, Farm Director, IUTAD
- Eng.<sup>o</sup> Fernando Augusto Madureira, DRTM
- Eng.<sup>o</sup> Dionisio Afonso Goncalves, IUTAD and Polytechnic Institute Braganca
- Padre Antonio Maria Cardoso, Editor, A Voz de Tras-os-Montes, Vila Real
- Eng.<sup>o</sup> Afonso Martins, Geoscience Department, IUTAD
- Dr. Thomas Gunter, Purdue Project Director in Portugal and IUBI
- Eduardo Rosa, Horticulture Department, IUTAD
- Eng.<sup>o</sup> Jose Francisco Gandra Portela, Ag Economics and Rural Soc. Department, IUTAD
- Rui Guimaraes, LNETI
- Jose Antonio S. Cabral, LNETI
- Jose Barros, CATIM
- Eng.<sup>o</sup> Jose Herculano Brito de Carvalho, Director DRTM (now State Secretary of Agriculture)
- Eng.<sup>o</sup> Fortunato Fonseca, Forestry Department, IUTAD
- Eng.<sup>o</sup> Antonio Moura, Head, Technical Services Department, IUTAD
- Eng.<sup>o</sup> Arnaldo Dias de Silva, Animal Science Department, IUTAD
- Eng.<sup>o</sup> Armando Mascarenhas Ferreira, Animal Science Department, IUTAD
- Students, IUTAD

The basic discussion with each of these people centered on the theme that IUTAD was interested in improving communications links between teachers and students and between the University and the people in the region and what, as far as they were concerned, were the greatest obstacles to good transfer of information, and what types of facilities would help them the most with their individual roles in the communications process. Each discussion was tailored to fit the individual or individuals involved.

In addition to gathering information, the team, particularly Professor Tyler, was also helping each individual gain a better understanding of basic communications theory and how it related to the work they were doing. One of the goals of the team was to get as many IUTAD staff members as possible thinking of their role in the communications process; thus each interview turned, to some extent, into a mini-course on basic communications.

Seventeen people from IUTAD, DRTM, IUBI and LNETI attended a workshop on basic communications held on June 22, 1983, on the IUTAD campus. During the morning session, Professor Tyler conducted a discussion on basic communications theory, and in the afternoon session, Professor Moses presented

slides of Purdue University library and audio-visual facilities and discussed types of equipment and services that could be a part of the T/LRC. Some of the material covered during this workshop appears later in Appendix H.

On June 23, 1983, another workshop was held for IUTAD people only. Attendance of only five people was somewhat disappointing, but the discussion of internal communications problems was quite worthwhile and pointed to a number of situations where improvements could be accomplished. These areas are covered in the text of this report and/or Sections E and F in the appendix.

In addition to the interviews, the team was taken on several tours to help them become acquainted with some of the problems in different areas of the region. Two trips in particular pointed out the contrasts in the areas making up the region served by IUTAD. These were the trips to Macedo de Cavaleiros to visit a wine and olive cooperative and to Chaves to visit a dairy cooperative.

Except for a trip to Mafra to consult with a furniture manufacturer about compact shelving for the library area of the new T/LRC, the work in the second phase was confined to the campus. During this period, inventories were taken of the Documentation Center, floor plans of the proposed remodeling of Building No. 2 were produced, a compact shelving area was designed to hold an expected growth for ten years (a little more than doubling the size of the collection) or 40,000 volumes, floor plans for furniture and equipment were laid out and a table of organization of the T/LRC was developed. Other work during this period included the listing of all equipment currently in place, and new equipment required for the T/LRC, the specification of new equipment for purchase, distribution of old equipment from the Documentation Center, the setting of priorities and writing of the final report.

The following reports were read as background material for this project.

- Allison, I. Kathleen, INITIAL PLANNING FOR IMPLEMENTATION OF TEACHING/LEARNING RESOURCE CENTER AT THE INSTITUTO UNIVERSITARIO DE TRAS-OS-MONTES E ALTO DOURO, April 1983.
- Allison, I. Kathleen, CURRENT AND POTENTIAL USES OF VIDEO IN IMPROVEMENT OF PORTUGUESE AGRICULTURE (PROCALFER Project), May 1983.

- Furtado, Lorraine T., A PLAN FOR THE DEVELOPMENT OF COMPREHENSIVE TEACHING/LEARNING RESOURCE CENTERS FOR THREE PORTUGUESE POLYTECHNICAL AND UNIVERSITY INSTITUTES, 1978.
- International Programs in Agriculture, SUMMARY OF PROGRAM OBJECTIVES AND PROCEDURES FOR SHORT-TERM ADVISORS, 1981.
- AID/NE-RFTP-70026, Subpart I. PORTUGAL RURAL POLYTECHNICAL INSTITUTES PROJECT (Vila Real and Covilha), 1979.
- U.S. Department of State, BACKGROUND NOTES--PORTUGAL, April 1981.

OUTLINE FOR WORKSHOP ON BASIC COMMUNICATION

June 22, 1983

- I. Review of the Communication Process
- II. The Effects of Communication Process Knowledge on the Behavior of the Source
- III. The Receiver as the Most Important Link in the Communication Process
- IV. Communication Theories: Aristotle, Lasswell, Johnson, Dildine, Shannon-Weaver, Schramm, Berlo
- V. The Purpose of Communication
- VI. Educational Communication Resources
  - A. Human--especially between sender and receiver, teacher and learner
  - B. Physical Facilities--environment for learning
  - C. Audio-Visual Communication Equipment--Purdue examples

ATTENDANCE AT THE WORKSHOP ON BASIC COMMUNICATIONS  
June 22, 1983

<u>Name</u>	<u>Unit</u>
MACEDO, Jose M. de Aguiar	IUTAD
CARVALHO, Jose Herculano Brito de	DRTM
MADUREIRA, Fernando Augusto	DRTM
ALVES, Amilcar Patricio Viegas	DRTM
SILVA, Herminio Jose F. da	IUBI
TORRES, Maria Helena de Araujo	IUBI
SOUSA, Vicente de Seixas e	IUTAD
MATOS, Fernando Manuel Caside Pinto de	DRTM
TORRES, Laura Monteiro	IUTAD
SANTOS, Fernando Augusto dos	IUTAD
SOUSA, Alvaro Luis Leonor de	IUTAD
GUNTER, Thomas	IUBI/AID
GUIMARAES, Rui	LNETI (CFT Norte)
CABRAL, Jose Antonio Sarsfield	LNETI (CFT Norte)
REAL, Fernando Nunes Ferreira	IUTAD
MADUREIRA, Maria da Graca	DRTM
FERREIRA, Armando Mascarenhas	IUTAD

ATTENDANCE AT THE WORKSHOP ON INTERNATIONAL COMMUNICATIONS  
June 23, 1983

<u>Name</u>	<u>Unit</u>
MACEDO, Jose M. de Aguiar	IUTAD - SD
MARTINS, Fernando M. Franco	IUTAD - Fitotecnia (Agronomy Dept.)
PEREIRA, Jose Manuel G. Torres	IUTAD - Biology/Plant Pathology
ROSA, Eduardo Augusto dos Santos	IUTAD - Fitotecnia (Horticulture)
REAL, Fernando Nunes Ferreira	IUTAD - Reitor

BERLO'S COMMUNICATION MODEL

Phase I

<u>Sender</u>	<u>Message</u>	<u>Channel</u>	<u>Receiver</u>
Admin.	We have a dream We want your ideas	Dept Heads Meetings Slides or charts	Dept Heads Dept Heads
Dept Heads	T/LRC concept Admin wants your inputs	Faculty meetings Slides and charts	Faculty Faculty
Faculty	T/LRC concept What can we put in it to help with your studies?	Class meetings	Students
Admin	We have a dream  We want your ideas	Formal & informal meetings	DRTM  Other users
Students & Dept Heads	Ideas  Relay student & faculty ideas	Class meeting Informal meeting Formal & informal meetings	Faculty Admin Admin

Phase II

<u>Sender</u>	<u>Message</u>	<u>Channel</u>	<u>Receiver</u>
Admin	Summary of input	Dept Heads meetings Formal & informal meetings	Dept Heads Other users
Dept Heads & Other Users	Questions & discus- sions for confi- & understanding	Formal & informal meetings	Admin

## Phase III

<u>Sender</u>	<u>Message</u>	<u>Channel</u>	<u>Receiver</u>
Admin	Progress of plans for constructing and moving T/LRC to farm campus	Dept Heads Formal & informal meetings	Dept Heads & faculty Other users
	Formation of policy for administration and use	Admin memos  Formal & informal	Heads, faculty  Other users
Faculty	Policies governing use of T/LRC	Class meetings Admin Posted visibly	Students C & S staff

**NORTH CENTRAL REGIONAL PUBLICATION NO. 1  
of the Agricultural Extension Services**

**HOW**   
**FARM PEOPLE**   
**ACCEPT**   
**NEW IDEAS** 

**SPECIAL REPORT NO. 15 (Reprint)**  
**Cooperative Extension Service—Iowa State University**  
**Ames, Iowa—November, 1962**

**AGRICULTURAL EXTENSION SERVICES OF**  
**Illinois — Indiana — Iowa — Kansas — Michigan — Minnesota**  
**Missouri — Nebraska — North Dakota — Ohio — South Dakota — Wisconsin**  
**Farm Foundation and United States Department of Agriculture, cooperating.**



## **Preface**

*The basic framework for this report is the result of the group efforts of the Subcommittee for the Study of the Diffusion of Farm Practices; an adjunct of the North Central Rural Sociology Committee which is sponsored by the Farm Foundation, Chicago, Ill.*

*The original draft was integrated by George M. Beal and Joe M. Bohlen of Iowa State University as a flannelgraph presentation entitled "The Diffusion Process."*

*Associate Director Marvin A. Anderson of the Iowa State University Cooperative Extension Service made several valuable suggestions and was instrumental in hastening the completion of this publication.*

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## How Farm People Accept New Ideas

Some farmers will try any new idea that comes along, while others will accept an idea only after it is proven in their neighborhood. A major concern of agricultural leaders is that of narrowing the time gap between the early and late adoptions of recommended practices. Some new ideas and practices are accepted quickly and with little apparent effort, while others are accepted only after years of effort on the part of agencies and leaders working with rural people.

This lag between *what is known* and *what is done* by most farmers has been the focus of considerable research in recent years by rural sociologists and others. Some aspects of the problem have been more adequately studied than others. Many of the studies are exploratory, resulting in only tentative findings.

Despite the many gaps in our present knowledge, there is a need for bringing together and interpreting the results of the various studies for use by agricultural leaders and agencies.

The major purpose of this publication is to show the process by which ideas become accepted. This diffusion process will be discussed from three points of view:

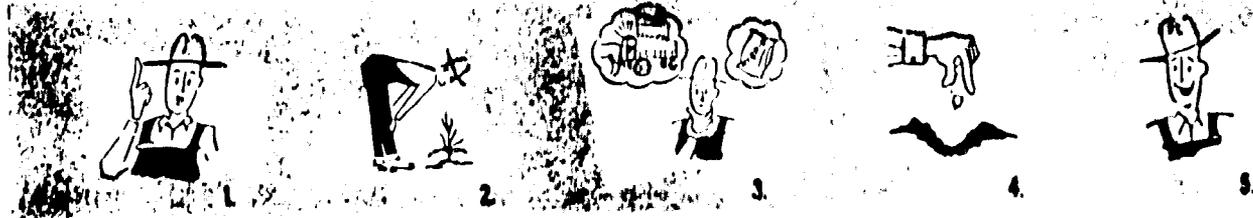
1. The stages through which an individual goes from the time he first learns of an idea until he adopts it, and the media which are most effective at these various stages.
2. Some situational and group influences affecting adoption.
3. Some of the characteristics of farm people as they relate to rate of adoption.

### Stages in the Process of Acceptance

The acceptance of a new idea is a complex process involving a sequence of thoughts and actions. Usually decisions are made after multiple contacts with various communication channels. These contacts are made over a period of time. For instance, the average time span from awareness to adoption of hybrid seed corn in Iowa was 7 years. Adoption of most

of acceptance. This process may be broken down into five stages as follows:

1. **AWARENESS:** At this stage the individual learns of the existence of the idea or practice but has little knowledge about it.
2. **INTEREST:** At this stage the individual develops interest in the idea. He seeks more



other hybrid seeds has come more rapidly. Changes which involve new skills or techniques usually require longer periods of time. However, once an idea has been introduced and the process initiated in any given community, some people can be found at all stages in the process

information about it and considers its general merits.

3. **EVALUATION:** At this stage the individual makes mental application of the idea and weighs its merits for his own situation. He

obtains more information about the idea and decides whether or not to try it.

4. **TRIAL:** At this stage the individual actually applies the idea or practice—usually on a small scale. He is interested in how to apply the practice; in amounts, time and conditions for application.
5. **ADOPTION:** This is the stage of acceptance leading to continued use.

An integral part of the acceptance process is the communication of information at these

various stages. Information is communicated through various channels which may be generally classified as follows:

1. Mass communications media (newspapers, magazines, radio, TV and circular letters)
2. Neighbors and friends
3. Salesmen and commercial dealers
4. Direct contacts with agricultural agencies (professional workers in Extension, Soil Conservation Service, Agricultural Conservation Program and Vocational Agriculture)

## THE DIFFUSION PROCESS

### In the Awareness Stage

At this stage the individual knows little about the new idea beyond the fact that it exists.

More people become aware of new ideas from mass communications media than from other sources. This is supported by studies in different parts of the country. Some studies, such as that of hybrid corn in Iowa, indicate that salesmen are important in creating awareness of new ideas which involve the use of a commercial product. Neighbors and friends are important creators of awareness of new ideas among the lower socio-economic groups.

Some studies reveal that government agencies such as the Extension Service and other agencies are the second most important contact for informing people of the existence of an idea.

It is at the AWARENESS stage that the mass media devices have their greatest impact. The evidence is that for the majority, mass media become less important as sources of in-

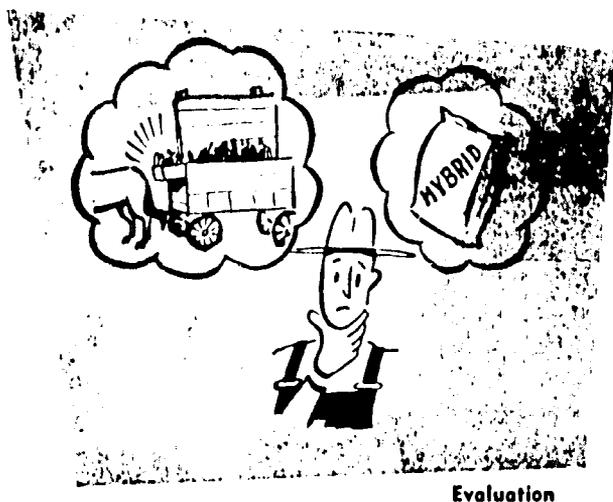
formation after the individual has become aware of the idea.

### In the Interest Stage

At this stage, the individual obtains general information about the idea. Mass media still play an important role in providing this type of information. They provide information which is timely and readily available from a wide range of sources. Many rely upon agri-



cultural agencies at this stage while others rely upon neighbors and friends. Agencies can provide results of experiment station research. Farmers with outside contacts are also important in stimulating interest in new ideas and practices. The channels of communication which can provide general information which rural people will accept as valid are the most influential at this stage.



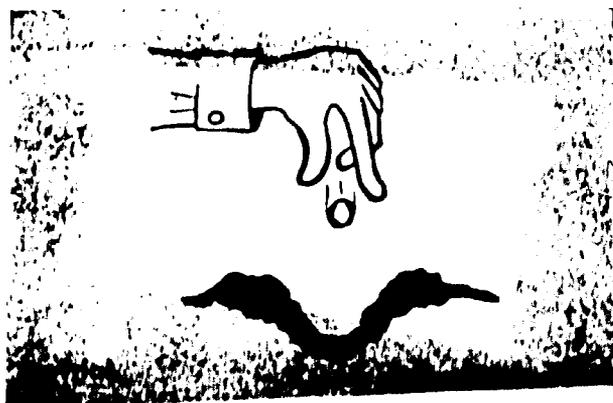
Evaluation

### In the Evaluation Stage

In this stage the potential adopter evaluates the new idea in terms of his own situation. He weighs its economic aspects in terms of land, labor, capital and net returns. He also appraises it in relation to values other than economic—i.e., his personal preference in enterprises and activities, family resources, family goals and interests, and its effect upon his relationships with his neighbors and friends.

The data available indicate that as people are evaluating an idea for their own use, they usually consult with neighbors and friends whose opinions they respect.

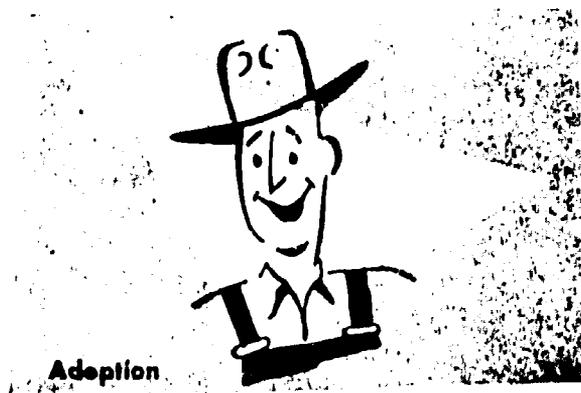
The earlier adopters tend to depend upon agricultural agencies during this stage. Farm people, in general, go to sources of information which they consider to be dependable for information at this stage. This usually means that the sources are ones with which the farmer has personal contact, i.e. his neighbors and friends. These sources have demonstrated ability to consider new ideas in terms of the local situation. The reasons for the apparent lack of importance of mass media and salesmen at this and later stages of the adoption



process are: (a) The information provided through these channels is too general; (b) the potential adopters mistrust some mass media information because they feel that the information is tempered by the business interests of those who are in control of them.

### In the Trial Stage

This is the stage where farm people preparing to try out the new idea are primarily concerned with getting information on how to do it and when to do it. Where possible, the new idea or technique is tried on a small scale, i.e., one bushel of hybrid seed corn was planted the first year; commercial fertilizers were used on small plots, etc. At this stage agricultural agencies become more important along with neighbors and friends, who continue to be important sources of information. Two-way information is usually needed to obtain the detailed information on *how* and *when* the new technique is



Adoption

to be applied. Some techniques require technical "know-how" which the average individual does not have.

Salesmen are important providers of information at this stage when a commercial product is involved.

Mass media have been relatively unimportant as information sources at this stage.

### In the Adoption Stage

This is the stage at which the idea has been completely accepted. The individual is satisfied with its use under existing conditions. The greatest single influence in continued use of any idea is the individual's personal satisfaction with early trials. Continued use also de-

pends upon the individual's success with the practice under varying conditions.

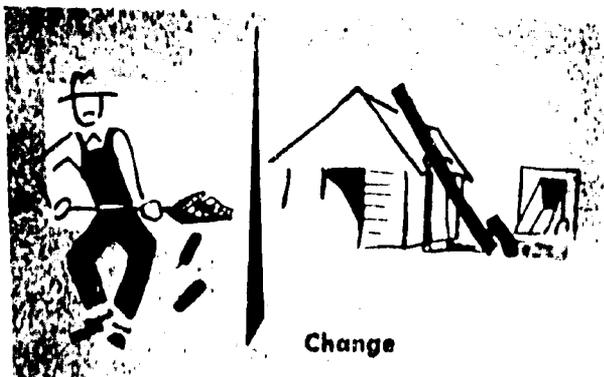
There is some evidence to indicate that adopters seek information to interpret results in relation to their own situation. This is most likely to be provided by neighbors and friends and agricultural agencies.

An understanding of failures of new practices is as important as interpretation of successes. For example, hybrid seed corn use is sometimes discontinued because individuals have used strains unadapted to their climate and soil conditions and have had results that were unsatisfactory.

### ***Diffusion Process Varies With Types of Change***

There is a wide variation in the types of changes in farming. They are of a qualitative as well as a quantitative nature. An example of a qualitative change would be a change from non-use to the use of commercial fertilizer. An example of a quantitative change would be the variation in the amounts of fertilizer applied. For some changes, however, the distinction between a quantitative and a qualitative change is not always clear—i.e., a change from low analysis to high analysis fertilizer.

The content of changes includes: (a) the change in the amount of human effort required, (b) the change in amount of capital or physical materials required, (c) the change in manipulative skills and (d) the change in management



ability required for maximum benefits from the new idea. Taking these elements into consideration, changes in farm practices may be classified as follows:

1. Change in materials or equipment only, without a change in techniques or operations (e.g., new variety of seed).

2. Change in existing operations with or without a change in materials or equipment (e.g., change in rotation of crops).
3. Change involving new techniques or operations (e.g., contour cropping).
4. Change in total enterprise (e.g., from crop to livestock farming).

Such a classification of changes is helpful in determining the role of various communicating agents in implementing change. For example, the one-way communication of the mass media may be sufficient to initiate a change in a seed variety, while a combination of media including two-way personal communication may be necessary to implement a change from straight-row to contour farming.

The relative advantage of the new as compared with the old way of doing things is another condition affecting its acceptance. In economic terms this is the comparison of output per unit of input—the relative efficiency of the new items. The greater the efficiency of the new technology in producing returns, not only in the form of economic goods but also in other forms of satisfaction, the greater its rate of acceptance.

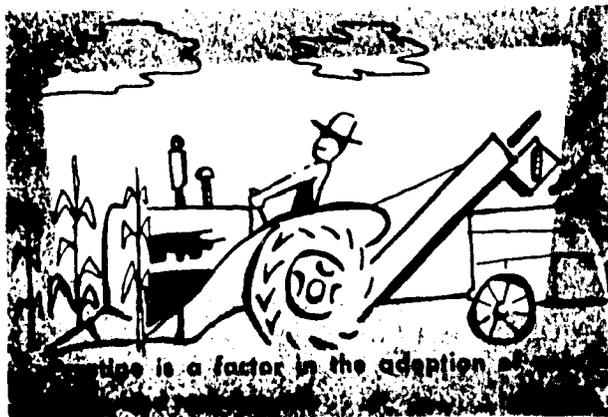
Another aspect of new practices affecting their rate of acceptance is the relative ease with which they can be demonstrated and communicated. For example, the ease with which an advantage of hybrid corn over open-pollinated varieties can be demonstrated no doubt has influenced its rapid acceptance. On the other hand, the difficulty of demonstrating the advantage of strip-cropping or new crop rotations has made for slower acceptance of these practices.

### ***Some Personal and Social Characteristics Related to Adoption of Practices***

The adoption of farm practices is influenced by social and psychological as well as economic factors. Community standards and social relationships provide the general framework wherein the process of change occurs. Individual differences help to explain variations in adoption of practices within the community.

### ***Group and Community Variations***

In some groups and communities people place a higher value upon material gains and money



than they do in others. In some, changes in farming are encouraged and expected. Prestige is attached to the adoption of new ideas and techniques. In others, more value is placed upon tradition and little freedom is allowed the individual to deviate from the group's pattern in adopting innovations.

If the adoption of new practices goes contrary to the established customs and traditions of the people, the innovator may be ridiculed or lose prestige.

The extent to which changes are adopted depends upon the values and expectations of the group and upon the extent to which the individual is expected to conform. Where there is great emphasis on maintaining family traditions and values rooted in the past, change occurs more slowly. On the other hand, where emphasis is upon individualism and personal success, change occurs more rapidly.

The acceptance of change is also influenced by the nature of leadership and control in the group or community. In one community, none would agree to go along with a program to eradicate brucellosis in dairy herds until one man in the community was sold on the idea. Once sold, he influenced all farmers in the community to go along with it. In this situation, change was brought about by working through the leader of the group. In most communities, no single leader has such influence. Whenever there are leaders that the people look to, it is important to identify and use them. The influence of informal leaders is likely to be greater where neighbor, community and kinship ties are the strongest.

The extent and nature of social contact within the community is important in the diffusion of new ideas and techniques. The presence of organizations whose objectives include the pro-

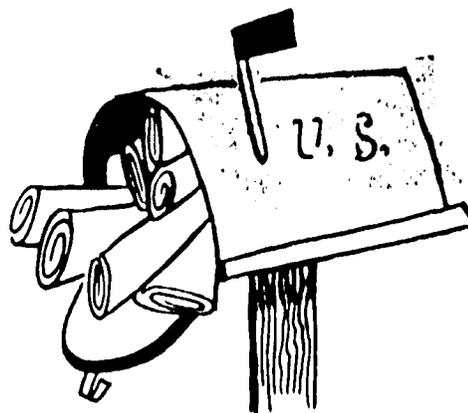
motion of changes will aid directly and indirectly in the diffusion process. On the other hand, where social contacts are primarily through kinship, visiting and other informal activities, there may be greater resistance to change. The introduction of change may disrupt these relationships. For example, the use of modern machinery makes the work-exchange group less essential. Hence, the nature of the social contacts in a community is an important factor in the process of change.

The degree to which social contacts are confined to the immediate locality is a factor. The broader one's social orientation, the more likely he is to accept new ideas. Only a few individuals may have such outside contacts, but they may be in a position to influence their neighbors. Local orientation on the part of the majority is not necessarily a limiting factor in the diffusion of new ideas so long as a few leaders have outside contacts.

Neighborhoods and clique groups facilitate exchange of farm information among their members. There is evidence that social cliques serve as barriers to the spread of information outside themselves. Members of neighborhoods and cliques rely more upon other members for information and advice in the adoption of farm practices than they do upon outsiders. This is due to the high degree of identification that prevails among intimate associates.

If information is from persons who are already well informed on the new practices, changes will take place more rapidly than if information is sought from friends regardless of how well informed they may be.

The social distances associated with wide status differences are also a factor in the diffusion of farm information through inter-



ideas through bulletins, farm magazines and newspapers

**personal channels.** For example, tenant farmers in some areas of the country do not get ideas from the large farm owners because of their lack of contact. Also small-scale farmers may fail to communicate with large-scale farmers. Rigid class structure impairs interclass communication of ideas.

### Individual and Family Variations

Decision making is influenced by the aspirations and capabilities of farm families. Individual member and family aspirations are reflected in their goals, values and means of achievement. Their capabilities include general farm knowledge and managerial skills of the operator and his family. These are related to such things as age, formal education, socioeconomic status and social contacts.

The more education an individual has, the more likely he is to adopt new farm practices. Those with high school training, and above, tend to adopt new practices earlier than those who have had less formal schooling.

Young operators tend to be more aware of and more favorable toward new ideas and practices, but are not always in a position to put their ideas into operation. This may be due to lack of available capital or land or lack of freedom to make decisions.

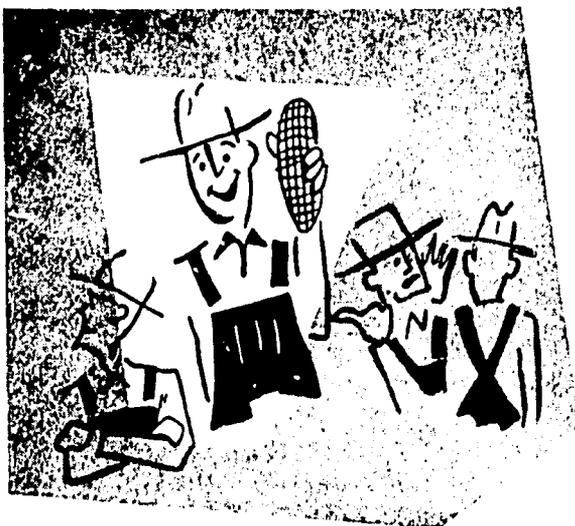
Participation in general farm organizations and farmer cooperatives is associated with early adoption of new farm practices. Favorable attitudes of farm families toward extension and other educational agencies is positively related to acceptance of farm practices.

Farmers who have children in 4-H clubs or vocational agriculture tend to adopt more approved practices than others. Participation in the adult extension programs is positively related to adoption of practices. Likewise, the number of contacts which individuals have with new ideas through bulletins, farm magazines and newspapers is positively related to early adoption of practices.

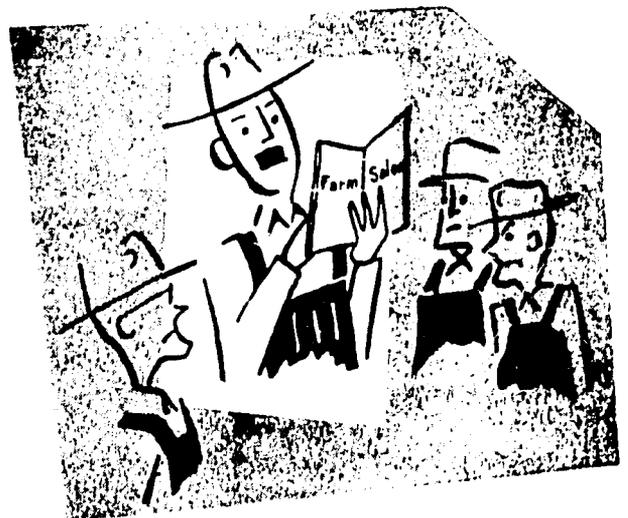
Individual and family goals and values affect the decisions to adopt or reject new farm practices by providing motivation for individual and family action. For example, the high value placed on security, as reflected in owning land debt-free and being reluctant to use borrowed capital, is negatively related to adoption of new practices. People who rate this value highly prefer to use money for paying off debt on their farms. Also new practices involve risks which people who place a high value on security are reluctant to take.

High values upon individual achievements and satisfactions are positively associated with adoption of new ideas and practices. These achievements and satisfactions include formal education for family members, modern living conveniences and family recreation.

Attitudes pertaining to the participation of family members in decision making and in the operation of the farm are associated with acceptance of changes in farming. For example, farmers who have sons over 12 years of age who encourage the adoption of new practices are among the earlier adopters. Those farm families having equitable arrangements for



**Innovator**



**Community Adoption Leader**

sharing farm income and ownership between father and sons tend to be earlier adopters than families in which the father retains control of the farm.

### **Sequence of Influences in the Adoption of Practices**

From the time a new idea is formed until it is generally accepted, multiple influences are at work. These include the various means of communicating ideas which have been discussed earlier in this report.

The relative importance of these means varies with stages in the process of acceptance discussed above. Also earlier and later adopters rely upon different channels of communication particularly at the evaluation and trial stages.

As shown on page 10, people may be classified into categories according to the sequence in which they adopt new practices: innovators, community adoption leaders, local adoption leaders, later adopters and nonadopters.

**Innovators** are the first to adopt new ideas. They are independent in their thinking and have a wider range of contacts. They are known as "experimenters" and "people who are always trying out new things." They are seldom named as persons to go to for advice on farming. They are not necessarily adoption leaders in their neighborhoods and communities. Such persons may not be present in every community.

**Community adoption leaders** are not the very first to try new ideas, but are among the first

to use approved practices in their community areas. They are not the persons who test the untried ideas but they are quickest to use tried ideas in their own situation.

The community adoption leaders are usually the larger and more commercial farmers in their areas. They have direct contacts with agricultural agencies and may be the leaders in farm organizations. They tend to have a higher level of education and read more bulletins, magazines and newspapers than do the average. They participate more than the majority in formal organizations and have wider social contacts.

**Local adoption leaders.** These are the people to whom the majority look for information and ideas in their farming operations. They are not necessarily innovators or early adopters, but they do adopt ideas sooner than the majority who look to them for information. They have information contacts with agricultural agencies and other farmers outside their immediate localities who have tried the ideas. In their personal and social characteristics they are similar to the majority, but they are expected to take the initiative within their groups. They are sometimes called informal leaders. Their leadership position is maintained on the basis of being "sound" and showing ability to use good judgment. One remains an informal leader only so long as he is considered by others to possess these attributes.

These local adoption leaders or informal leaders are important links in the chain of communication. Studies show that these informal



**Local Adoption Leader**



**Later Adopters**



condition the decisions of farm operators in considering new ideas and practices.

The adoption of a new idea follows a sequence of influences from the time an idea is formed until it becomes generally accepted. In this diffusion process people may be classified into types based upon the sequence in which they accept new ideas and practices as follows: innovators, community adoption leaders, local adoption leaders and later adopters.

One of the functions of leaders among farm people is to diffuse new ideas and practices. It is their task to expedite the process of getting ideas from their sources of origin to those who can use them.

To be effective in this process one must know what techniques to use at the different stages and how to mobilize them effectively.

He must also know in which stages in the diffusion process the people are. For example, it would be a waste of energy to devote educational efforts to instruct people how to do something—information pertinent to the trial stage—when the majority of them are at the stage of needing data about what the idea is—i.e., at the interest stage.

In order to be most effective, an agricultural leader must know how to use all of the communications channels available to him. For example, the informal leaders have contacts and influence with people which no other channels can provide. The most effective use of the informal leader requires that one work with him on an informal basis. Giving the informal leader public recognition may jeopardize his position of leadership and thereby the influence which makes him an important resource in extension and other programs.

In order to be effective as an educational worker one must understand:

- a. The nature of the acceptance process.
- b. The values and aspirations of the people with whom he must work.
- c. The formal and informal group relationships within his area.
- d. The availability and most appropriate use of mass communications.
- e. The sequence and interrelationships of influences in acceptance of new ideas.

In addition to knowing how to use the various channels of communication in bringing about adoption of practices, educators must be sensitive to the customs, values and aspirations of the people with whom they work. Changes are accepted when they support these values and aspirations. Hence it is important to show how and to what extent they do so. For those most concerned with the security obtained by owning their farms free of debt, one can show how the adoption of improved practices will contribute toward this end. For those placing a high value upon material conveniences, one can show how the adoption of improved methods of farming will help obtain these conveniences.

Finally, the person attempting to speed up the process of acceptance of new ideas and practices must be aware of the total process and the sequence of influences at different points in this process. It is necessary to intermesh the impersonal with the personal and the technical with the nontechnical. In this sense the influencing of change is an art which requires sensitivity to the many phases of the acceptance process; it also requires the ability to make most effective use of the various means of influencing acceptance.

## SAMPLE READINGS

A representative sample of literature in this field follows:

- Lionberger, Herbert F., "The Diffusion of Farm and Home Information as an Area of Sociological Research," *Rural Sociology*, Vol. 17, No. 2, June 1952, pp. 132-144.
- Lionberger, Herbert F., Sources and Use of Farm and Home Information by Low-Income Farmers in Missouri, University of Missouri Agricultural Experiment Station, Research Bulletin 472, April 1951.
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- March, C. Paul, and A. Lee Coleman, "Farmers' Practice-Adoption Rates in Relation to Adoption Rates of 'Leaders'," *Rural Sociology*, Vol. 19, No. 2, pp. 180-183, June 1954 (research note).
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- Wilkening, E. A., Acceptance of Improved Farm Practices in Three Coastal Plain Counties, North Carolina Agricultural Experiment Station, Technical Bulletin 98, May 1952.
- Wilkening, E. A., Adoption of Improved Farm Practices as Related to Family Factors, University of Wisconsin Agricultural Experiment Station, Research Bulletin 183, December 1953.

A bibliography containing over 110 references to work in this field is available. Write:

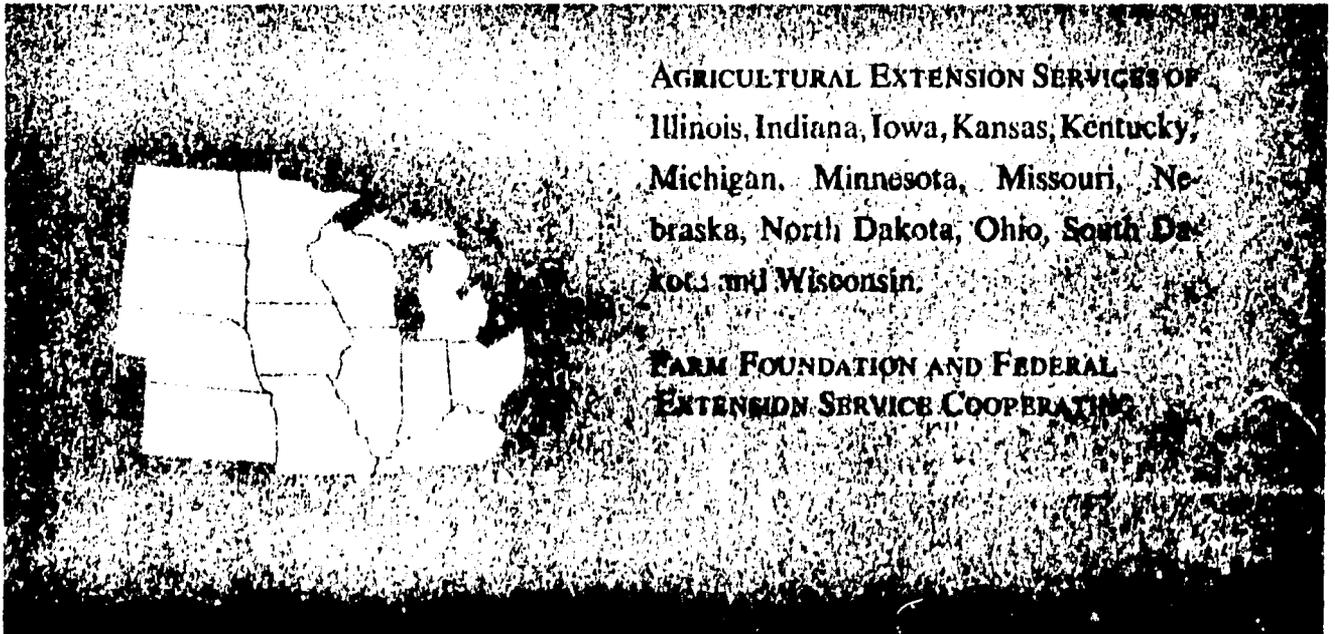
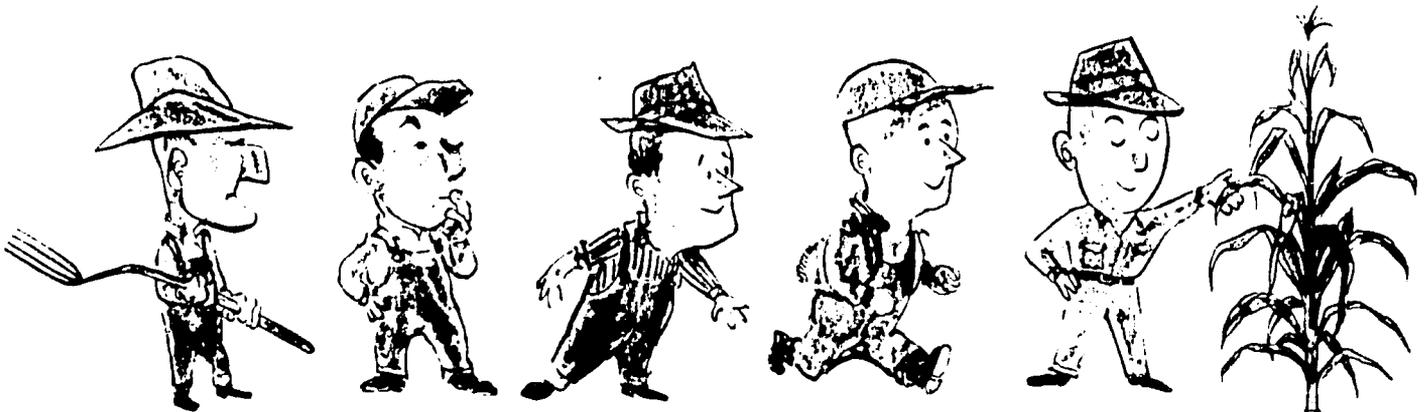
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# ***ADAPTERS OF NEW FARM IDEAS***

Characteristics and Communications Behavior



## *Preface*

This publication is the second in a series of bulletins by the Subcommittee for the Study of Diffusion of Farm Practices. This group is a part of the North Central Rural Sociology Committee, sponsored by the Farm Foundation, Chicago, Illinois, and the Association of Land-Grant Colleges and Universities.

North Central Regional Publication No. 1, *How Farm People Accept New Ideas*, was received with widespread interest; over 80,000 copies were distributed in the first four years of its publication. The present bulletin is intended to complement, rather than to replace, the original report and to present findings of additional research.

The original bulletin set forth a framework or a theory as to how farmers adopt new technology. Since the original bulletin was published in 1955, considerable research has been completed and it is now possible to further support and extend the understanding of how farmers adopt new practices. A recent bibliography lists 135 studies of the diffusion of new ideas which have appeared in scientific journals, theses, research bulletins, and unpublished papers. Many of the studies emphasize the characteristics of the adopters of new ideas which are pertinent to educational programming.

*How Farm People Accept New Ideas* emphasizes the process through which individual adopters accept new ideas. This bulletin describes the characteristics of innovators and other adopters which should be considered in Extension program planning.

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# ADOPTERS OF NEW FARM IDEAS

## Characteristics and Communications Behavior

THERE IS ALWAYS a time lag between the origin of a new idea and its complete adoption. About 14 years elapsed between the introduction of hybrid seed corn and its adoption by most farmers. Soil testing as a basis for fertilizer application has been recommended for over 20 years. Yet the majority of farmers have not adopted it. Although the time lag in the adoption of new farm practices and ideas probably is decreasing, several years may be required for their widespread use.

A major concern of rural sociological research has been to reduce this time lag between scientific discovery and actual use of new developments in farming. One body of facts growing out of these studies indicates that farmers who adopt practices in various points in time have distinctive characteristics. Educational programs of County Agents, Vocational Agricultural teachers, and other change agents which are developed with an understanding of these characteristics are more likely to be effective. This suggests that change agents design educational programs which meet the needs and communication skills of the various farm audiences whom they serve.

This publication attempts to summarize research findings in rural sociology which describe these characteristics of adopters. A system of classifying farmers in regard to the relative points in time at which they adopt new ideas and practices will be used for this purpose.

Generalizations stated in this report are based upon studies carried out in North Carolina, Iowa, Wisconsin, New York, Kansas, Ohio, Kentucky, Missouri, Michigan, Illinois, Pennsylvania, and a number of foreign countries. These findings generally are applicable to the family-type farming areas of the United States and other countries. The findings of research on the adoption of farm practices generally are supported by the research on adoption of new ideas in medicine, education, and industry.

### *Adopting New Ideas*

Two interrelated processes help bring new ideas from their source of initial development to acceptance by farmers. These processes are called *diffusion* and *adoption*.

The diffusion process refers to the spread of new ideas from originating sources to ultimate users. In the case of agriculture, it is the process by which new farm practices or ideas are communicated from sources of origin, usually scientists, to farmers.

The adoption process is a mental process through which an individual passes from first hearing about a new idea to its final adoption. It may be divided into stages. A division commonly utilized by rural sociologists is:

1. *Awareness.* The individual knows of the new idea but lacks information about it.
2. *Interest-information.* The individual becomes interested in the idea and seeks more information about it.
3. *Evaluation-application-decision.* The individual makes a mental application of the new idea to his present and anticipated future situation and makes the decision either to try it or not.
4. *Trial.* The individual uses the new practice on a small scale to validate its workability on his own farm.
5. *Adoption.* The individual uses the new practice on a full scale and incorporates it into his way of farming.

At any point in this process an idea may be rejected. Even after adoption of an idea, the process may be repeated when an alternative is presented.

A major difference between the diffusion process and the adoption process is that diffusion occurs between persons while adoption is an individual matter. An understanding of both processes is important to a change agent.

### *Factors Affecting Adoption*

The research studies reported in this bulletin were primarily concerned with ideas developed by agricultural scientists and approved by Experiment Stations, Extension Services, and other agricultural agencies. Examples of new ideas studied are hybrid corn, weed sprays, livestock feed additives, bulk milk tanks, pesticides, fertilizer, tillage practices, and new farm machinery.

Some individuals may accept new ideas regardless of

what other farmers do. Other ideas require acceptance by a group of farmers before any one of them can use the idea. An example of the latter is the use of electricity; unless a sufficient number of one's neighbors are ready to use central-station electricity, an individual farmer cannot obtain it (a power supplier must have an economic minimum number of customers before he can distribute electric power at rates the customers can afford). Another example of group adoption is the use of bulk milk tanks. The use of these tanks is not economically feasible until several farmers are willing to change from the can-cooling method.

Most farm practices are functionally interrelated. Frequently the adoption of one practice makes possible the adoption of others. In some cases, the adoption of a given practice must precede the adoption of others. For example, the adoption of bulk milk tanks is frequently followed by the installation of pipe-line milking systems.

The relative speed with which a new idea is adopted depends partially upon the characteristics of the new idea. Some characteristics affecting the rate of adoption are:

1. *Cost and economic returns.* New practices that are high in cost generally tend to be adopted more slowly than do the less costly ones. However, regardless of cost, practices which produce high returns for dollars invested tend to be adopted more rapidly than those which yield lower returns. Also, practices producing quick returns on investments tend to be adopted more readily than those which produce deferred returns or returns spread over a long period of time.
2. *Complexity.* New ideas that are relatively simple to understand and use will generally be accepted more quickly than more complex ideas. For example, increased fertilizer application is likely to be more readily accepted than an innovation in fertilizer application methods.
3. *Visibility.* Practices also vary in the extent to which their operation and results are easily seen or demonstrated. For example, sprinkler irrigation is a highly visible practice; in contrast, some rat poisons kill the rodents in their burrows and the results cannot be

observed and evaluated easily by the farmer. The more visible the practice and its results, the more rapid its adoption is.

4. *Divisibility.* Practices such as fertilizer applications, different fertilizer analyses, feed additives, weed sprays, or seed varieties may be tried on a sample basis and the results compared with those from previous practices. However, bulk milk tanks and milk parlors cannot be tried out easily on a small scale. A practice that can be tried on a limited basis will generally be adopted more rapidly than one that cannot.
5. *Compatibility.* A new idea or practice that is consistent with existing ideas and beliefs will be accepted more rapidly than one that is not. A farmer who believes that he gains status from planting straight rows may be slow to accept contouring, often referred to as "planned crooked rows." Farmers who already have adopted hybrid seed corn and who are familiar with the concept of hybrid vigor are more likely to adopt hybrid hogs and hybrid chickens. One research study showed that farmers who owned a power sprayer for the use of insecticides on crops adopted chemical weed spray more quickly than those who did not own power sprayers.

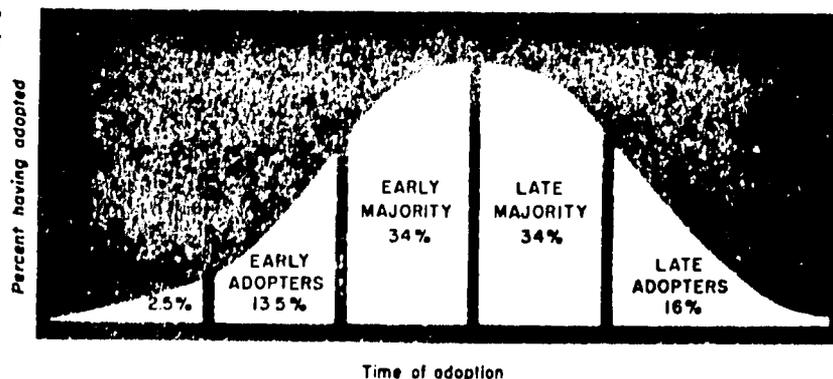
### Adopter Categories

Farmers adopt practices at different times. Research indicates that the diffusion of a new practice usually requires several years. In the first years, a few farmers adopt it; then in a short span of time, a large number try it; and finally the remainder accept it. This represents the typical pattern.

The distribution of farmers adopting a new idea by year of adoption generally has the shape of the normal curve (see Figure 1). This characteristic on the diffusion curve permits distributing farmers into adopter categories.

The first to adopt a new practice are *innovators*. Research in the Midwest indicates that these farmers have personal and social characteristics which are significantly

Figure 1. — Distribution of farmers among the five categories according to time of adoption.





different from those adopting later. This category includes about one farmer in forty.

Those in the second category of farmers to adopt a practice are called *early adopters*. They too have distinctive characteristics. About one in eight farmers fall in this category.

The majority of adopters—about seven in ten farmers—fall in the next category. For some purposes, this category may be divided into the *early and late majority*.

The last farmers to try new practices may be referred to as *late adopters* or *laggards*. They comprise possibly one out of six farmers in the Midwest. They possess personal and social characteristics different from those adopting earlier.

An innovator for one practice is likely to be an innovator for other practices. Research has shown that individuals tend to be consistent as to the relative time at which they adopt new farm ideas. This permits the construction of farm practice adoption scales which may be used to place farmers into adopter categories. It should be recognized that this classification of farmers is most useful when it includes a large number of farmers. Although farmers in a small area may not be distributed in these proportions in the various categories, these categories are highly useful in building educational programs.

### *Personal Characteristics of Adopters*

Research studies indicate important differences among the five adopter categories with regard to attitudes, values, abilities, group memberships, social status, and farm business characteristics. This suggests that the successful change agent will need to employ one approach to reach the early adopters with an innovation and a different approach to reach the late majority. To use the most effective technique to reach each sub-audience, a change agent must understand the personal characteristics of each adopter category.

### ATTITUDES AND VALUES

1. Innovators have more favorable attitudes toward science than do farmers in other adopter categories. Laggards have less knowledge about agricultural research and are more suspicious of scientists. Innovators are more likely to have direct contact with a scientist and are more prone than the average farmer to adopt a new practice on the basis of research findings.

Innovators tend to place high value on the role of science in agriculture and to recognize the contribution of the scientist to their operations. In contrast, laggards and the late majority place less value on science and have less appreciation of the scientist's role.

2. Laggards and late majority farmers place more trust in agricultural "magic" and traditional beliefs than do innovators and early adopters. Examples of agricultural magic are planting crops or dehorning cattle by the "signs of the moon" or witching for wells with a Y-shaped branch. Innovators generally scoff at all types of agricultural magic.

3. The first farmers to adopt new practices tend to place less value on the security that comes from being debt-free. They are willing to borrow money and to take risks in order to realize a profit. The adoption of



some new practices, such as bulk tanks, sprinkler irrigation, and new farm equipment, requires the investment of considerable capital. Laggards, on the contrary, are reluctant to borrow money. They try to get out of debt and to stay out.

4. Innovators have more venturesome attitudes than do the last farmers who adopt new practices. Innovators reach decisions more quickly than other farmers and often adopt new practices soon after they learn about them. In one study, the innovators adopted a new weed spray the same year that they learned about it. After hearing about it, some of the laggards took 10 years to adopt the practice. Since uncertainties are involved in the initial farm use of a new idea, innovators take certain risks that their later-adopting neighbors are not willing to take.

Older age tends to be associated with conservative attitudes, diminishing farm enterprises, and an emphasis on security. Although research findings have not been entirely consistent as to the relationships between age and time of adoption, most studies have found laggards to be older than innovators. In one study, laggards averaged 55 years while innovators and early adopters averaged 38 years of age.

#### ABILITIES

1. Research findings generally indicate that farmers who are among the first to adopt new practices have the most formal education. In a Midwestern study, innovators averaged slightly more than a high school education; about twenty percent were college graduates. In contrast, the laggards averaged only slightly more than a grade school education.

2. The first farmers to adopt new practices tend to have special *mental* abilities. For an innovator, adoption requires a high level of intelligence and an ability to deal with abstractions. Research has shown that innovators read more farm magazines and Extension bulletins than do laggards. This suggests that they may have superior reading skills. The first farmers to adopt must be able to secure much of their new farm information from printed mass media sources, while

late majority and laggards depend upon personal contacts with their neighbors who already have adopted.

#### GROUP MEMBERSHIPS

Research indicates that farmers who are relatively early in adopting new practices are more active in formal organizations such as farm organizations, cooperatives, PTA's, and churches. Laggards belong to fewer formal groups. This tends to mean fewer contacts with sources of new ideas. Innovators also belong to more kinds of groups.

Innovators and early adopters are more active in state-wide and county-wide organizations; late majority and laggards are active mainly in formal groups in the local community and neighborhood, if they are in any groups at all.

Family and kinship ties are stronger for laggards and late majority than for innovators and early adopters.

The informal friendship patterns of the laggard tend to be confined to his locality, while those of the innovator are more cosmopolitan. Innovators are less likely to exchange work and equipment with their neighbors, less likely to visit their neighbors, and more likely to disregard their neighbors' opinions of new farming practices. Innovators recognize that their neighbors do not have respect for their farming methods. This does not disturb the typical innovator who has a wider range of contacts.

Innovators travel over a wide area to observe new farm practices in operation. They often may be members of friendship cliques with other innovators. One innovator remarked, "I saw and discussed broiler operations and cattle feeding operations in Indiana, Illinois, and Iowa, as well as Ohio this year." Another said, "I visited with swine research men at the Iowa and Minnesota (Agricultural Experiment) Stations."

Community norms on adoption affect the respect that innovators receive. In "progressive" communities, innovators may be looked to by their neighbors for information and advice. In "backward" communities, their farming methods are viewed with suspicion by their neighbors who are less prone to change.

#### SOCIAL STATUS

A general finding of sociological research in many states is that innovators have a higher social status than do laggards. Innovators ordinarily have greater community prestige, higher incomes, larger farms, and more wealth than other farmers. Even though innovators may have high social status, their farming methods may not be respected. Laggards usually have the lowest social status.

Change agents have frequently referred to a "trickle-down process" in agriculture whereby the first adopters



influence other farmers who, in turn, influence still others to adopt. Research indicates that information generally spreads from higher to lower status farmers. Most farmers look up the status ladder to others who have somewhat higher status than themselves as sources of information and advice. The higher a farmer is on the status scale, the more selective he becomes in his choice of personal sources of information.



**FARM BUSINESS CHARACTERISTICS**

There are differences in the nature of the farm businesses among the adopter categories. The farm enterprises of innovators in comparison to those who adopt later are characterized by:

1. Larger farms
2. Higher gross farm incomes
3. Greater farm efficiency
4. More specialized enterprises
5. Greater farm ownership

*Sources of Information*

Farmers obtain information from many sources. Research has shown that sources most used by farmers vary with stages in the adoption process. Table 1 lists the relative frequency that sources of information are mentioned by farmers at each of the stages. It must be clearly recognized that the order may vary with specific practices, places, and people.

It can be seen in Table 1 that mass media sources, such as farm magazines, newspapers, and radio, are most important at the awareness and interest stages. Neighbors and friends are more important than mass media at the evaluation and trial stages. When farmers use a new practice on a small scale, agricultural agencies generally are secondary in importance to neighbors and friends. A tentative decision to use the new practice has been made at the trial stage, but further information is needed on how to use the practice on their farm and how to incorporate it into their farming system.

Since most new farm practices involve the sale of a new farm product, a question might arise as to why dealers and commercial sources of information are not more important in the adoption process. One answer may be that farmers sometimes question the trustworthi-

Table 1. Rank Order of Information Sources by Stage in the Adoption Process

AWARENESS:	INTEREST:	EVALUATION:	TRIAL:	ADOPTION:
learns about a new idea or practice	gets more information about it	tries it out mentally	uses or tries a little	accepts it for full-scale and continued use
1. Mass media — radio, T.V., newspapers, magazines	1. Mass media	1. Friends and neighbors	1. Friends and neighbors	1. Friends and neighbors
2. Friends and neighbors — mostly other farmers	2. Friends and neighbors	2. Agricultural agencies	2. Agricultural agencies	2. Agricultural agencies
3. Agricultural agencies, Extension, Vo-Ag., etc.	3. Agricultural agencies	3. Dealers and salesmen	3. Dealers and salesmen	3. Mass media
4. Dealers and salesmen	4. Dealers and salesmen	4. Mass media	4. Mass media	4. Dealers and salesmen

Personal experience is the most important factor in continued use of an idea.

ness and expertness of dealers and salesmen because they have a product to sell.

### *Information Sources and Adopter Categories*

The typical innovator not only receives more different types of information about new practices, but also is likely to receive information sooner and from more technically accurate sources. Innovators subscribe to more farm magazines than farmers in other adopter categories. Mass media sources of information of all kinds, including bulletins and farm radio and TV shows, are important to farmers in every adopter category. Laggards are reached more frequently through mass media than through personal contact with change agents. Mass media sources of information may make a farmer *aware* of a new practice. They seldom are effective in convincing him to adopt it.

#### SCIENTISTS

It already has been pointed out that innovators more often have direct contact with agricultural scientists than do farmers in other adopter categories. Innovators also have more favorable views toward scientists and toward the use of science in agriculture. They read more research bulletins and reports are more likely to know scientists personally.

#### CHANGE AGENTS

Research indicates that early adopters have more contact with County Extension Agents, Vocational Agricultural teachers, and other agricultural agency workers than do farmers in other adopter categories including the innovators. One reason why this is true seems to be that the innovator often learns about new practices *before* the local change agent. The innovator travels widely, visits with other innovators and agricultural scientists, and is likely to regard his local County Extension Agent as a "technical equal." Many innovators view their County Agent in a "potential role" in which he may be called upon for information if needed.

Figure 2 presents a typical pattern of Extension contact by adopter categories. The early adopters not only have the most *total* Extension contacts, but also are ranked especially high in the number of *personal* Extension contacts that they have through meetings, office calls, and farm visits. Laggards have an average of only 1.35 Extension contacts per year. Furthermore, these contacts are mostly newspaper articles and radio shows. Laggards and the late majority have very little personal contact with their County Agent.

Contact with other change agents probably follows a

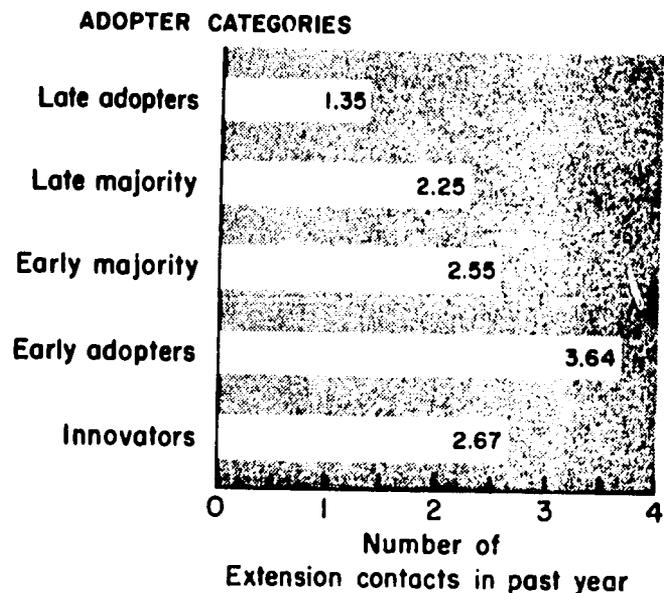


Figure 2. — Contacts of adopter categories with Cooperative Extension Service.

similar pattern. Research findings of farmers' contacts with Vocational Agricultural teachers indicate early adopters are reached most frequently, followed by innovators, early majority, late majority, and laggards.

#### FRIENDS AND NEIGHBORS

Laggards and late majority are more likely to depend upon friends and neighbors in the immediate locality as a source of new farm information than upon other sources. Innovators and early adopters are not locality-bound in their choice of farmers as sources of information. For innovators, expertness is the prime consideration in their selection of information sources.

Innovators, in that they are out in front of other farmers, cannot depend upon friends and neighbors or others in the locality for new ideas. On the other hand, by the time the late majority and laggards consider adopting an idea, they are surrounded by other farmers who have information and opinions about it.

Mass media are important in creating awareness of new practices, while personal influence from neighbors and friends is most important in convincing farmers to adopt. Farmers living within the immediate locality of an innovator may not be important referents to him. This does not mean that innovators are not influenced by other people. An innovator's referents are more likely to be scattered over a wide geographical area and to be those members who also are inclined to quick adoption of new practices. Association among innovators often provides group support for changes made or contemplated that the local neighborhood does not provide.

*How Information Reaches the Farmer:  
An Illustration*

One of the major concerns of change agents in agriculture is the relationship between farmers in the various adopter categories. Some of these relationships, particularly the crucial importance of early adopters in the diffusion process, are presented systematically in Figure 3. The early adopters, as has been pointed out, accept new practices well before the average farmer, but not so much sooner that they are ridiculed as innovators may be. As a result, the early adopters are looked to by other farmers as sources of information and advice about new practices. Change agents have relatively more contact with these

early adopters than with any other adopter category. Information which helps this group decisively is passed along to other farmers with some revisions and recommendations.

In Figure 3, the sources of information about a new practice for 14 farmers are shown against a background of mile grid, common in the Midwest. This gives a good picture of the location of their farms in the area. The time of adoption of the new practice is given in each case:

Farmer No. 1 was an innovator. He secured his information about the practice directly from an agricultural scientist. The only farmer in the community who looked to him for advice was Farmer No. 2, an early adopter. Eight neighbors of the early adopter secured information

Table 2. Summary of Characteristics and Communication Behavior of Adopter Categories

Characteristic or Behavior	Innovators	Early adopters	Majority		Laggards or Late adopters
			Early	Late	
1. Time of adoption	First 2.5 per cent to adopt new ideas	Next 13.5 per cent to adopt	Next 34 per cent to adopt	Next 34 per cent to adopt	Last 16 per cent to adopt
2. Attitudes and values	Scientific and venturesome	Progressive	More conservative and traditional	Skeptical of new ideas	Agricultural magic and folk beliefs; fear of debt
3. Abilities	High level of education; ability to deal with abstractions	Above average education	Slightly above average education	Slightly below average education	Low level of education; have difficulty dealing with abstractions and relationships
4. Group memberships	Leaders in county wide or state organizations; travel widely	Leaders in organizations within the community	Many informal contacts within the community	Little travel out of community; little activity in formal organizations	Few memberships in formal organizations other than church; semi-isolates
5. Social status	Highest social status, but their farming practices may not be accepted	High social status; looked to by neighbors as "good farmer"	About average social status	About average social status	Lowest social status
6. Farm businesses	Largest, most specialized, and most efficient	Large farms; slightly less specialized and efficient	Slightly larger than average sized farms	Slightly smaller than averaged sized farms	Small farms; low incomes; seldom farm owners
7. Sources of information	Scientists; other innovators; research bulletins	Highest contact with local change agents; farm magazines; Extension bulletins	Farm magazines; friends and neighbors	Friends and neighbors	Mainly friends and neighbors; radio farm shows

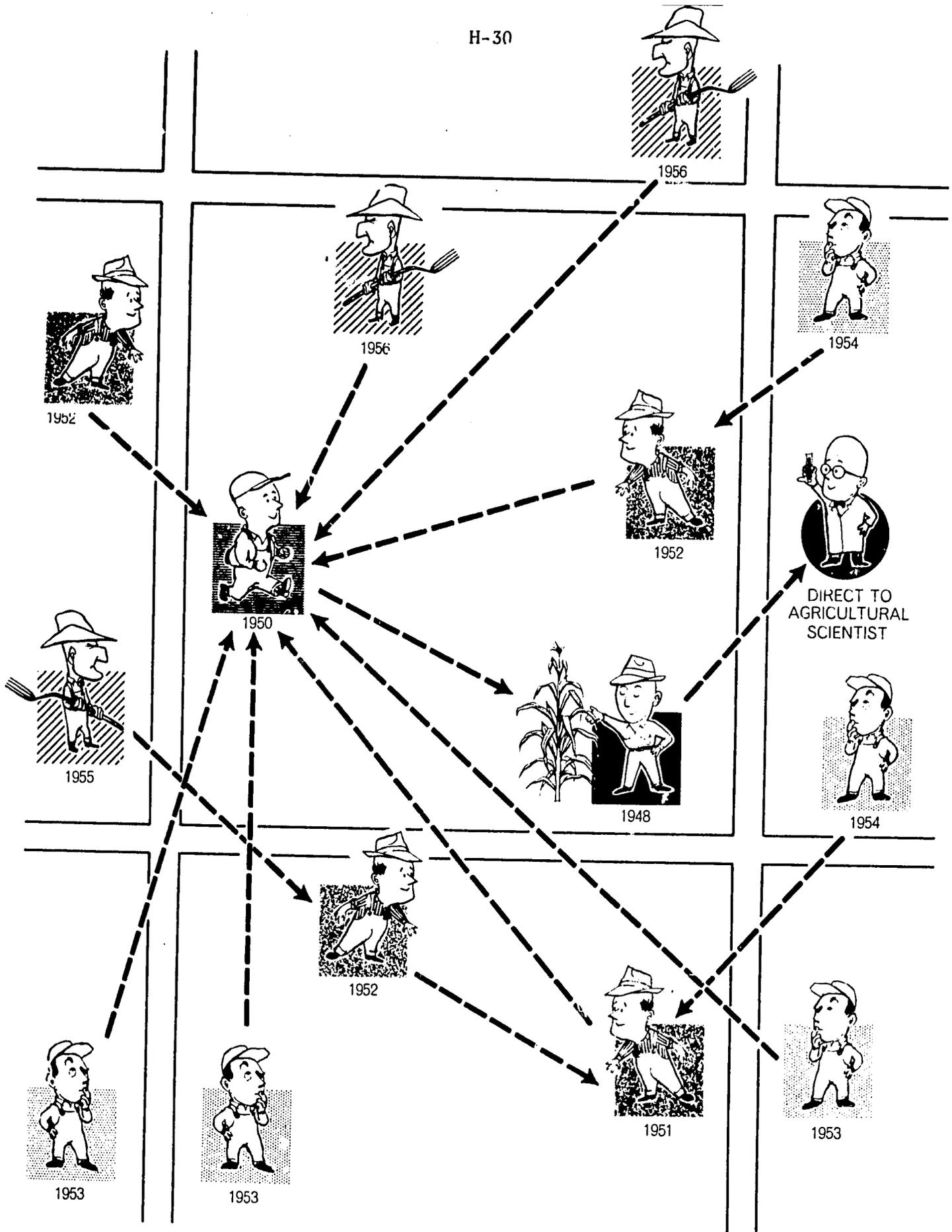


Figure 3. — How fourteen Midwest farmers obtained information on a new farm practice. Farm locations are shown against a mile grid.

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from him. Some adopted it directly, others indirectly. For example, Farmer No. 12, across the road from Farmer No.2, secured information from 4, who got his from 3, who in turn had received his from 2.

This diagram represents a good summary of the operation of the diffusion and adoption processes. An understanding of these processes is basic in building and implementing educational programs.

### *Summary*

This publication summarizes and synthesizes the many research studies that have been completed by rural sociologists on the topic of the diffusion of agricultural technology. Special emphasis is placed upon the characteristics and communication behavior of the adopters of the new farm practices.

The characteristics and communication behavior of farmers by various adopter categories are summarized in Table 2.

### *Some Applications*

Farmers who are early, intermediate, and late adopters of new ideas and practices in farming have distinctive characteristics. Educational programs developed in terms of these characteristics are more likely to be successful than are those that fail to take them into account. It is fairly obvious that an educational program developed for innovators or early adopters would not mean much to laggards. One designed for laggards makes little sense to an innovator.

The question arises as to what group of farmers an agricultural agent has in mind when he designs a program or parts of a program. The knowledge now available makes it possible to develop programs specifically for farmers in the different adopter categories and, by doing so, to develop a total educational program which is logically consistent and which maximizes the contributions of the various adopter groups to each other. This is one way to increase the impact of educational programs.

Innovators, although a small group, cannot be ignored in the development of educational programs. They can be expected to go directly to public and private research sources, such as land-grant colleges, universities, and experiment stations for information. Their major educational problem is keeping informed, and they are well aware of it.

Early adopters, who are a little less prone to change, are somewhat less likely to seek information and may require some proof of local applicability of new ideas.

Later adopters are less inclined to seek new information, and more proof of local applicability almost certainly will be required. These are some of the conditions that need to be considered in developing educational programs.

Whether or not farmers in an adopter category are sought after as sources of information by other farmers is another relevant consideration. While innovators are carefully watched by other farmers in the locality, they are not likely to be consulted as sources of farm information. Even where they are consulted, their advice is likely to be discounted.

The farmers most sought as sources of farm information are likely to adopt new practices a little later than innovators and may require some selling to convince them of the merit of the new practice. They are most likely to be found in the early adopter category in communities that place a high premium on alertness to new developments in farming and on quick acceptance of them.

In communities less amenable to change, persons most sought as personal sources of farm information are likely to be in the early or even late majority category. In either case, farmers frequently sought as source of farm information may be depended upon to inform late adopters about new ideas in farming. However, the advice given along with the information is likely to be different in communities placing a premium on change and in those generally resisting changes in farming.

Innovators and early adopters assume risks that late adopters are not willing to, and perhaps cannot safely, assume. They provide the local trial needed to show that the new idea or practice is locally applicable and useable. Speeding up adoption rates of those normally late to adopt may require some means of providing for the risk taking and local legitimating functions.

In considering educational programming through group action, it is well to remember the following:

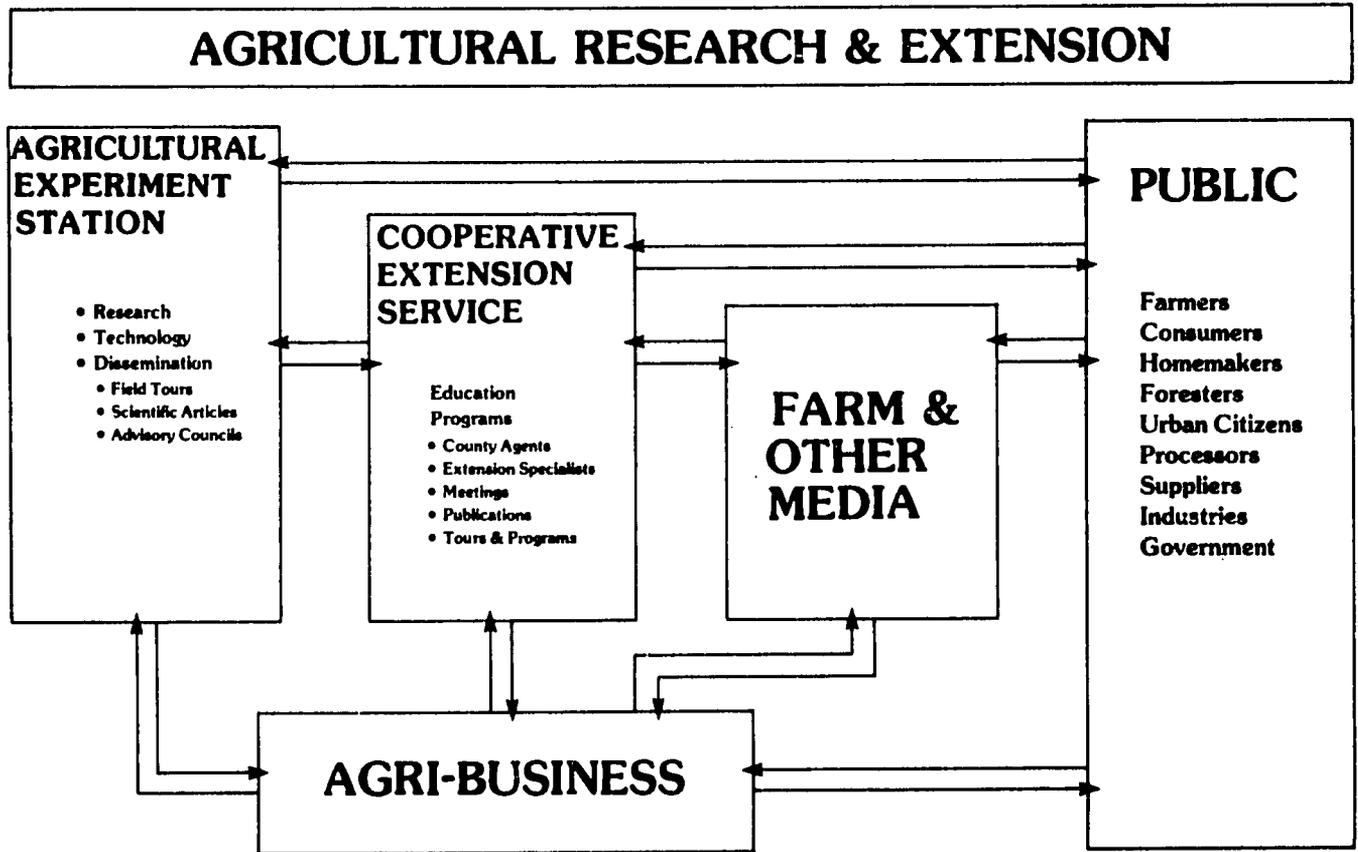
- (1). Late majority and laggards are not likely to attend meetings called for educational purposes, nor are they likely to be members of formal organizations where new ideas in farming are commonly discussed.
- (2). Innovators are likely to attend meetings, but are not likely to be impressed by what other farmers in the locality think just because they happen to be their neighbors.
- (3). Early adopters and the early majority are most likely to be present at local meetings and are most likely to be influenced by others in attendance. They also are most likely to be active members in such formal groups as farm organizations, civic clubs, and local improvement associations.

It is unlikely that Extension Agents and other change agents in agriculture will have available in the near future all the information they would like or need to develop sound educational programs. More imagination is needed in utilizing the information presently available and the findings of research on the diffusion and adoption processes.

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COMMUNICATIONS FLOW BETWEEN  
AGRICULTURAL RESEARCH, EXTENSION AND VARIOUS PUBLICS



(ARROWS REPRESENT INFORMATION INPUT & FEEDBACK)

OPINION LEADERS: KEY COMMUNICATORS IN EXTENSION  
H.S.Tyler, Colorado State Univ. 1966, unpublished

## CHAPTER III

## DISCUSSION

Opinion Leader Defined

Opinion leaders are a social phenomenon--with an important communications and leadership function. They seek information and they convey this information to others.

An opinion leader may influence a large following or several small groups with different interests. Usually, they are influential for specific areas of interest.

Opinion leaders occur in every level and segment of society, ranging from children's play groups to thought leaders on a national or even global scale. They may be radical, conservative, educated, uneducated, progressive, or laggard. But the thing they all have in common is a following.

Opinion Leaders Differ from Their Followers

Opinion leaders have been described as being like their followers, only more so. In other words, they represent to their followers a person to be emulated; they tend to fulfill the norm deemed desirable by their followers.

But they are different. They circulate outside the group they influence and tend to set the pace. Yet their difference is not pronounced enough to inhibit social

communication with those who follow them.

### Two Major Types of Opinion Leaders

The idea of two major types of influentials is most helpful in gaining an understanding of opinion leaders. The distinguishing difference in the way in which they influence others is based in their orientation toward local and outside society.

A "local" influential may be regarded as a home town or home community product, born and reared in the local community. The local may be well educated in a college at considerable distance from home, yet he has returned to the community and is intensely interested in local people and local problems. He identifies strongly with the community, and feels deeply rooted there.

"Cosmopolitan" influentials may or may not have been born and raised in the community. But they tend to have contacts and interests outside the immediate locality.

They tend to be younger than the localite and they feel that they could pursue or advance their careers elsewhere with similar success.

Cosmopolites probably tend to influence people who have similar cosmopolitan leanings, but they also have influence with people who regard them as sources of outside information.

Locals feel it is important to know as many people as possible; their status and prestige depend upon it. And they are willing to help as well as to be helped by the

people they know who follow and support them.

Different organizations attract locals and cosmopolitans. The locals tend to join organizations which tend to strengthen and enhance local ties of kinship and acquaintance. Cosmopolites pursue their special skills and interests through groups such as professional societies or hobby groups.

One of the most distinguishing marks between local and cosmopolite influentials, especially at the more prominent levels, is political interest and involvement. Locals stand for elective office, while cosmopolites tend to occupy appointive posts which call for exercise of their special skills or outside information sources.

Even the mass media habits differ according to local and cosmopolitan orientation. Locals seem to spend more time and concentration in reading local news, listening to local radio and TV, and paying close attention to items about local people. Cosmopolitan influentials subscribe to magazines which keep them abreast of affairs outside the community.

It would be erroneous to say that locals are not interested in affairs outside the local community, and that cosmopolites are not interested in local happenings. But the outlook or orientation is the important difference--a subtle difference which enables these two types of influentials to use their influence with different people in different ways.

### Opinion Leaders' Information Sources

One thing both local and cosmopolitan influentials have in common is the ability to acquire the information which gives them their competence.

In general, opinion leaders get their information both within and without the community, but they are able to screen and select the messages which their followers seem to expect from them.

Opinion leaders apparently have greater skill than their followers in selecting pertinent messages from the mass media, and they use the mass media more heavily.

Opinion leaders seem to know how to get the information they need from more knowledgeable persons. And in general, they seem more inclined to use all sources of information.

### Influence Exerted by Opinion Leaders

Opinion leaders wield their influence in an atmosphere of trust. Their followers see them as reliable pillars of counsel and fountains of reassurance.

The opinion leader is not considered to be a power figure, nor does he regard himself as such. He may have power, but his intent is not perceived to be manipulative.

As previously noted, opinion leaders screen and select the information they pass on; and, in addition, the messages they transmit are flavored with positive or negative recommendations.

Another factor that enhances the opinion leader's

influence is his accessibility. He tends to be more active in formal and informal groups which provide greater opportunities for personal contact. These additional contacts serve his needs for both acquiring information and relaying it to others.

### Extension's Work With Opinion Leaders

#### Early Extension Work

It is quite possible that early extension workers were influenced by the progressivist educational philosophy of "learning by doing," or by the theory that people tend to imitate creative people. If this was not so, then the extension pioneers were truly gifted with insight about the power of personal influence as a communications force.

Of course, the time may have been ripe. Communications systems were developing and the United States was industrializing rapidly. And the teachable moment may have been at hand.

Nonetheless, demonstrations did prove to be a very effective teaching tool. New farming and homemaking practices were diffused.

#### Studies Measure Indirect Influence

But it was only after sociologists and extension evaluators began to ask, "Why?" that opinion leaders came to be recognized as being important in the scheme of extension teaching and communication.

### Clues for Working With Influentials in Extension

By understanding the social organization of a community or neighborhood, an extension worker can use the instrument of latent or innate power of personal influence in the community to help carry out educational programs.

But this is an undertaking that calls for much skill, tact, and keen observation.

Since the extension worker, by virtue of his position, is an influential, he must know how to wear both the localite and cosmopolite influentials' hats. Within the scope of extension are situations where the local influential point of view must be considered. Then the extension agent must think in local terms, local issues, local politics.

In contacts with cosmopolitan oriented influentials, the extension agent must be prepared to supply the information which will satisfy their needs. And through the use of mass media, some of the cosmopolite influentials may be reached without even knowing who they are.

It is especially important to be familiar with the theory of adoption process and information diffusion, since both cosmopolitan and local leaders play key influential roles.

### Handle With Care

Extension workers should use their knowledge of opinion leaders wisely and carefully. For some influentials,

an overdose of public attention can destroy their function  
as an opinion leader.

## CHAPTER IV

## SUMMARY

Opinion leaders are an important link in the diffusion of information. They seek information, they pass judgment on the information, and they convey it to others who trust them.

Opinion leaders occur in every level and segment of society. They represent the social norms of their followers, and they circulate outside the group they influence, but their difference is not great enough to hinder interaction with their group.

There are two kinds of influentials--local and cosmopolitan. Locals identify strongly with the home community and are people oriented. Cosmopolitans exert influence through the knowledge or special skill they can share.

Extension workers can use opinion leaders' influence to diffuse information among the general population without knowing exactly who these key people are. But they must be prepared to think in local or cosmopolitan terms as the situation demands.

Finally, this understanding of influentials must be used judiciously so that the two-step flow of communications will not be interrupted.

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PLAN FOR INTER-INSTITUTIONAL TELECOMMUNICATIONS NETWORK

The information contained in Appendix I could serve as a model for a plan for an inter-institutional telecommunication system for Portugal, or for a region of the country.

The single page summary report (page I-2) is an example of how the Indiana Higher Education Telecommunication System (IHETS) is used to disseminate agricultural information state wide. The remainder of Appendix I provides an historical view of the development of IHETS. It must be kept in mind that that these publications are ten years old and that there has been a great deal of technical improvement in television since these pieces were written.

If such a plan is of interest to IUTAD, it would behoove the persons doing the planning to gather together all of the latest material published on IHETS and similar networks.

EVALUATION OF THE USE OF CLOSED CIRCUIT TELEVISION BY A PURDUE UNIVERSITY  
SPECIALIST TO TEACH GRAIN MARKETING PRINCIPLES

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ABSTRACT

During February and March, 1982, Indiana's Cooperative Extension Service presented a series of six grain marketing information programs to audiences at 15 viewing sites via the television facilities of the Indiana Higher Education Telecommunications System (IHETS).

Participants were enrolled in the grain marketing "short course" by county Extension agents. A \$45 fee was charged to offset costs of using the IHETS network and of publishing and mailing study materials (handouts).

Some 421 persons viewed the series at Purdue and 14 regional sites and filled out evaluative questionnaires which elicited their responses to demograph information, respondents' perceptions of the TV picture and sound quality, helpfulness of content, handouts and instructor's presentation.

Frequencies were tabulated for all viewing centers. Cross tabulations of selected variables were run to determine if demography and viewers' perceptions were related to various responses about helpfulness of subject matter content, handout and instructors' presentation.

Data were analyzed utilizing the Statistical Package for the Social Sciences (SPSS).

Results: In general, audio and video quality at viewing locations were rated "good" to "excellent." TV sound was rated "good" by 48% and "excellent" by 46% of all respondents. About 85% of all respondents rated the TV picture "good" (50%) or "excellent" (35%). About 24% reported difficulty in hearing some of the questions which were transmitted from viewing centers by phone to the TV studio.

Most of the information presented was new to 45% of all respondents, with most of it new to 62% of the 73 farmers with off-farm income. 55% of the 298 full-time farmers said that "only part of the information was new" to them. Of the 243 respondents who received 2/3 or more of their income from grain sales, 58% said that only part of the information was new to them.

Strong majorities in all age groups regarded the televised material as "most helpful." 74% (309) of respondents said the handout materials were "most helpful."

Nearly 70% (290) of all respondents said that new information was made clear to them, and they rated the instructor's presentation as "easy" or "fairly easy" to understand.

Nearly 95% (397) of all respondents said that the TV series lived up to or exceeded their expectations, and they rated it "good" (55.6%) to "excellent" (39.1%).

Income from enrollment fees amounted to \$22,752, while out-of-pocket expenses came to \$16,331.18, producing a net of \$6,420.82.

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INDIANA  
HIGHER EDUCATION  
TELECOMMUNICATION  
SYSTEM

A model for a plan for an  
Inter-Institutional Telecommunication  
System for Portugal

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## INTRODUCTION: OVERVIEW

On March 11, 1967, Governor Roger Branigan signed into law the Indiana Higher Education Telecommunications Act which, with subsequent amendments, authorizes the Boards of Trustees of Ball State University, Indiana University, Indiana State University, Purdue University, Vincennes University, and Indiana Vocational Technical College "to jointly arrange from time to time for a period not exceeding ten years for the use of a multi purpose, multi-media, closed circuit, state-wide telecommunication system furnished by the Communications Common Carriers subject to the jurisdiction of the Public Service Commission of Indiana."

The System, which has come to be known as the Indiana Higher Education Telecommunication System (IHETS), was envisioned as the instrument through which the State Universities, their regional campuses, IVY Tech, and the Statewide Medical Education Plan (authorized under separate legislation) might mobilize and share scarce educational resources.

Since its authorization in 1967, IHETS has grown into a sophisticated telecommunications instrument which includes as component parts a computer controlled switched television network, a classroom to studio talkback capability, and the State Universities Voice Network (SUVON), which is used for both voice and data communication (computers, teletype, etc.). IHETS is also an organization which seeks to determine educational needs and endeavors to shape the use of various media (telephone, teletype, television, radio, computers, etc.) in a direction which will meet those needs and attain other valid educational objectives.

Overall control and supervision of IHETS is presently vested in the Board of Directors of the Indiana Higher Education Telecommunication System. This Board is the chief policy making body of the System, and it serves as the sole vehicle through which institutional commitments are made to inter-university projects. A State Universities' Telecommunication Coordinating Council (SUTCC) provides critical support in the development of policy and in the supervision of various interinstitutional panels and conference groups.

The Board employs a professional staff to operate and manage the System.

The IHETS mission, in carrying out its broad purpose, has four general functions:

### 1. Communications

To operate communication networks interconnecting educational centers in Indiana

and to facilitate the flow of messages along these channels.

### 2. Education --

To assist users of the channels in shaping applications of the media to the attainment of educational objectives, and to encourage use of the media planned within the broader context of the teaching learning situation.

### 3. Cooperation --

Through its total organization, to link the State Universities and the many campuses of the Indiana Vocational Technical College in their mutual effort to improve their own educational programs and to assist their collective efforts to reach a wide spectrum of educational constituencies within the State.

### 4. Innovation and Change --

To provide the human "networks" (committees, publications, telephone conferences, etc.) through which people involved in higher education may devise creative solutions to educational problems, and to manage change by collaborative planning.

## LEGISLATIVE AUTHORIZATION

**Basic Authority** -- Chapter 358 of the Acts of the 95th General Assembly of Indiana (passed as House Bill 1819) specifies that the Telecommunications System shall "interconnect the main campuses and the regional campuses of the State Universities, and centers of medical education and services." The State Universities are granted power in the Act to permit "any other institution of higher education or any other governmental or public corporation or body, or any other corporation, individual, partnership, association, trust or other person to use the telecommunication system or any portion thereof for educational purposes, subject to such rules, regulations, fees, and charges as such State Universities, committee, or other body may prescribe." (See Appendix C)

Origination of program material for use on the System is the responsibility of the individual institution or organization, and any costs of production are to be borne by these institutions or organizations.

**Statutory Purposes** -- The legislation directs the governing institutions to "provide for a broad dissemination of a wide variety of educational communications for the improvement and the advancement of higher educational opportunity...."

Among the justifications for the Act, the General Assembly cited the need for providing telecommunications services to the citizens of

Indiana in support of certain specified fields of educational endeavor, namely:

- Statewide Medical Education
- Continuing Education and Professional Retraining
- Vocational and Technical Training for Post-High School
- On-the-Job Training in Business and Industry
- Servicing Educational Television Stations
- Sharing Educational Resources between Public and Private Institutions of Higher Learning
- Servicing Secondary and Elementary Schools

## DEVELOPMENTAL HISTORY

**The First Television Microwave Network** — emerged during the 1961-62 school year as arrangements were completed with the telephone companies of Indiana for the installation of a television microwave system linking Lafayette, Indianapolis, and Bloomington.

The first configuration was designed to serve two purposes: the exchange of instructional materials between the two main campuses, and the distribution to the regional campuses of materials originating on the main campuses. The great bulk of the network traffic consisted of materials originated on the main campuses of the two universities (Purdue and Indiana) for their respective regional campuses in Indianapolis.

By comparison, the use of the System for the exchange of courses and seminars between Purdue University and Indiana University was small; however, the experience gained from this small amount of continuing interinstitutional exchange was highly beneficial.

In February, 1967, Purdue extended its television system from Lafayette to its regional campus in Hammond and to the Indiana University/Purdue University regional campus in Fort Wayne; at the same time, Indiana University included the Medical Center in Indianapolis as both a reception and origination center. Programs could then be originated or received at four locations: Purdue University/Lafayette, Purdue University/Indianapolis, Indiana University Medical Center/Indianapolis, Indiana University/Bloomington. Three additional locations were equipped to receive only: Purdue University/Hammond, Indiana University-Purdue University/Fort Wayne, and Indiana University/Indianapolis.

A master switching center was developed at Lafayette which made it possible to reconfigure the network in a great variety of combinations; talkback was automatically reconfigured whenever the video network was. Such features were retained in the first video network established

under the Indiana Higher Education Telecommunication System in February of 1968.

**Preliminary Studies by State Universities** — During the 1965-66 school year, Purdue University contracted with Jansky & Railey, consulting engineers from Washington, D.C., to conduct an extensive evaluation of its television system and to make recommendations for future development. During that school year Purdue University was joined in the expense and scope of this study by Indiana State University, Ball State University, and Indiana University; consequently, the Jansky & Railey mission was enlarged to include the development of a statewide higher education telecommunication system. The Jansky & Railey report in two volumes was issued in September of 1966.

**The Problem of Medical Education** — The direction medical education should take was much discussed from 1965 through 1967; five municipal corporations were urging the State Legislature to create a new medical school in their cities. Even before this period, Indiana University had been investigating Indiana's medical education needs. Intensive studies revealed that the most pressing demand was for improving graduate education for interns and residents and for continuing medical education to serve practicing physicians.

The School of Medicine, therefore, proposed a system which would utilize telecommunication connections with 20 or more teaching hospitals in the State and a fund which the hospitals could use to supplement their budgeted amounts for medical education. This was seen as a way to increase the effectiveness of intern training and, at the same time, step up the professional training of doctors in practice. Consequently, the needs of medical education began to argue in favor of a statewide telecommunications network.

**Final Plans and Legislative Action** — Representatives of Ball State, Indiana, Indiana State, and Purdue Universities met regularly during the Fall of 1966. Early in their deliberations they considered the introduction of a bill calling for \$3,500,000 which would permit the construction of a state-owned telecommunication facility. At the same time, this group met with the telephone companies serving the State and kept them informed of the plans and operating requirements being developed. With the support of the telephone companies, the \$3,500,000 proposal was discarded in favor of one calling for slightly less than \$1,000,000 to be utilized in leasing telecommunication facilities from the telephone companies.

The 1967 Legislature passed the Indiana University Medical Plan and appropriated some \$2,500,000 for its implementation; a substantial portion of this appropriation was for the establishment of a statewide medical communication

network. The Legislature also passed the Indiana Telecommunication Act (House Bill 1819 – see Appendix C) but reduced the requested amount from \$1,000,000 to \$600,000. Resources derived from both Senate Act 359 and House Bill 1819 were used to effect the goal of a statewide medical education network; intercity telecommunications were obtained through the Telecommunications Act and connection to hospitals within cities through the medical plan.

**Vincennes University and IVY Tech Join System** – On April 2, 1971, Governor Whitcomb signed into law House Enrolled Act No. 1879. This legislation amended the original Act by including Vincennes University as a full member of IHETS with votes on the Board of Directors and on the State Universities Telecommunication Coordinating Council. House Enrolled Act No. 1126, which was signed by Governor Whitcomb on February 17, 1972, made Indiana Vocational Technical College a full participating member.

## **PRESENT SYSTEM FACILITIES AND SERVICES**

**SUVON** – The facilities of SUVON (State Universities' Voice Network) consist of fourteen trunk groups, comprised of 162 intercity telephone dial tie-line trunks, connecting switchboards of the State Universities and their regional campuses through a central switching system located in the Indiana University Medical Center Centrex at Indianapolis. In addition to these groups of intercity trunks, intercity "off-premise extensions" connect Columbus, IVY Tech Columbus, the Indiana University Eastern Center at Richmond, the Commission on Higher Education, and others to the Indianapolis Centrex.

At all but a few of the regional campuses, it is possible for the campus telephone operator to "extend" incoming SUVON calls "off-net," i.e., to dial any local (non-toll) telephone number and connect the SUVON caller to it. This permits university staff and faculty who have a SUVON-accessible phone to call regular numbers in the various cities having main or regional campuses. It is also possible for campus operators at most locations to receive calls originating off-campus in their community and extend that call via SUVON to any other campus. It is also possible for callers on SUVON to dial unassisted any non-toll number in Indianapolis by first dialing the access code for the Indiana University Medical Center, then dialing 9 for an Indianapolis dial tone, and finally the Indianapolis number itself.

The SUVON system is intended to carry faculty and administrative communications for the State Universities. It also carries the traffic generated

by TALKBACK (see below), and is used for the transmission of teletype signals either as a communication between people or as computer communications.

Since March of 1971 a computer program has been used to reduce raw data obtained by telephone company recorders to a graphic and numeric representation of traffic flow on every SUVON trunk group. With the aid of these printouts, the Operations Department of IHETS is able to monitor continually the needs of various regional campuses for additional telephone trunks and adjust trunking to maintain the level of quality engineered into SUVON, namely, an average of no more than 20 "busies" per 1,000 call attempts.

In general, SUVON can be thought of as capable of carrying any kind of signal which may be transmitted over standard telephone circuits. This includes facsimile, blackboard-by-wire, and various kinds of computer data transmission as well as voice.

The majority of the individual circuits making up SUVON are obtained by purchase from the U.S. Government Service Agency (GSA) which initially obtained them from the common carrier at TELPAK rates, a volume pricing arrangement which results in costs on the order of 66¢ per mile per month instead of costs six times that amount or more.

**Video Net** – The switched video network, a statewide network for television transmissions of the State Universities, consists of a variety of microwave radio transmission paths, special switches for routing signals in particular directions, a computer to control the routing, and ancillary equipment of many kinds to monitor and control the operation of the network.

The entire system is leased from the telephone industries of the State. Indiana Bell is the key company of this group, which also includes General Telephone & Electronics, Illinois Bell, and the Long-Lines Division of American Telephone and Telegraph.

The basic geographic form of the network is shown on the map provided in Appendix A. On many, but not all, of these routes there are multiple, bi-directional trunks to facilitate simultaneous transmission from, as well as reception by, particular locations. Also possible is simultaneous origination of two different programs from the same source, primarily the main campuses of the four major State Universities. The arrangement of video trunks is such that all six of the possible originators of programming, Indiana University, Purdue University, Indiana State University, Ball State University, the Medical Center,

and IHETS Control itself, can simultaneously use the network to reach one or more other locations. Many locations, Fort Wayne, South Bend, Gary, Hammond, the Medical Center, and IHETS Control, are thus capable of receiving two different programs, emanating from the same or different originators, simultaneously. The remaining locations may receive only one program at a time. If need exists, any originator may transmit to all locations on the network at once.

The flexibility of scheduling and utilization conferred by this arrangement is unique and has demonstrated its worth repeatedly. Maintaining maximum flexibility has been, in fact, a constant goal throughout the design and augmentation of the network.

**Projected Additions to Video Net** — Although the backbone of a system of video distribution trunks is now in existence, growing service demands indicate a need for additional channels at the following locations for the reasons indicated:

1. **South Bend:** A return channel is needed to permit program origination from northern Indiana. IVY Tech has indicated that its initial acquisition of origination capability is targeted for South Bend. Consequently, some means of sharing instructional television materials originating in South Bend is imperative. In addition, the most fully-equipped private institution, Notre Dame, is located nearby.

2. **Vincennes:** A return circuit from Vincennes via Terre Haute will be necessary in order to permit Vincennes University to originate programming.

3. **Richmond:** Indiana University has indicated that it wishes reception capability for its Eastern Center in Richmond shortly after this facility is housed in its permanent campus sometime during 1974. IVY Tech, hospitals, and other sites in the Richmond area can also receive service once this channel is installed.

4. **Public Television Station Interconnects:** Connection of additional public television broadcasting stations to the IHETS television network is needed for the transmission of instructional and general education programs from all origination points on the network directly to homes within the signal areas of stations in the following cities: Evansville, Indianapolis, New Albany/Jeffersonville and Louisville, Kentucky. As explained on page 17, IHETS service is already available to public television stations in Bloomington, Muncie, Vincennes, and the Calumet region.

5. **Indianapolis IVY Tech Originations:** Completion of television studio facilities for IVY Tech Indianapolis in January of 1975 will call for the addition of a local channel connecting that studio to the IHETS Network. This connection will allow IVY Tech to originate from Indianapolis to its

regionals and to exchange instructional materials with South Bend.

6. **Private Colleges and Universities:** Current policy permits private colleges and universities to interconnect with the System under arrangements where such private institutions assume any add-on costs occasioned by their interconnection.

**The Pipeline Concept for the Switched Video Network** — From the earliest discussions concerning a statewide telecommunications system, the term "pipeline concept" has been used. Briefly, this refers to the flexible use of a broad BANDWIDTH of frequencies for a variety of transmissions including video, audio, and data. The microwave equipment which transmits the present switched video network service, for instance, employs a 10 megahertz band of frequencies, of which 4.5 megahertz is used for video and the subcarrier at 6.6 megahertz for associated program audio. This band width could be channeled in a number of other ways, for a variety of purposes. For instance, simultaneously with video and program audio transmission the microwave band has room for at least three additional subcarriers. When the total band width is not required for television, the full band width may be further fractioned to secure channels for high-speed data, high fidelity sound, and a number of voice grade and teletype circuits.

The early dream of the System's originators was to use all this technical capability to the greatest possible extent in order to achieve maximum economies. However, there have been no specific requests brought forward, to date, which would lead to the development of such uses of the present broadband video network.

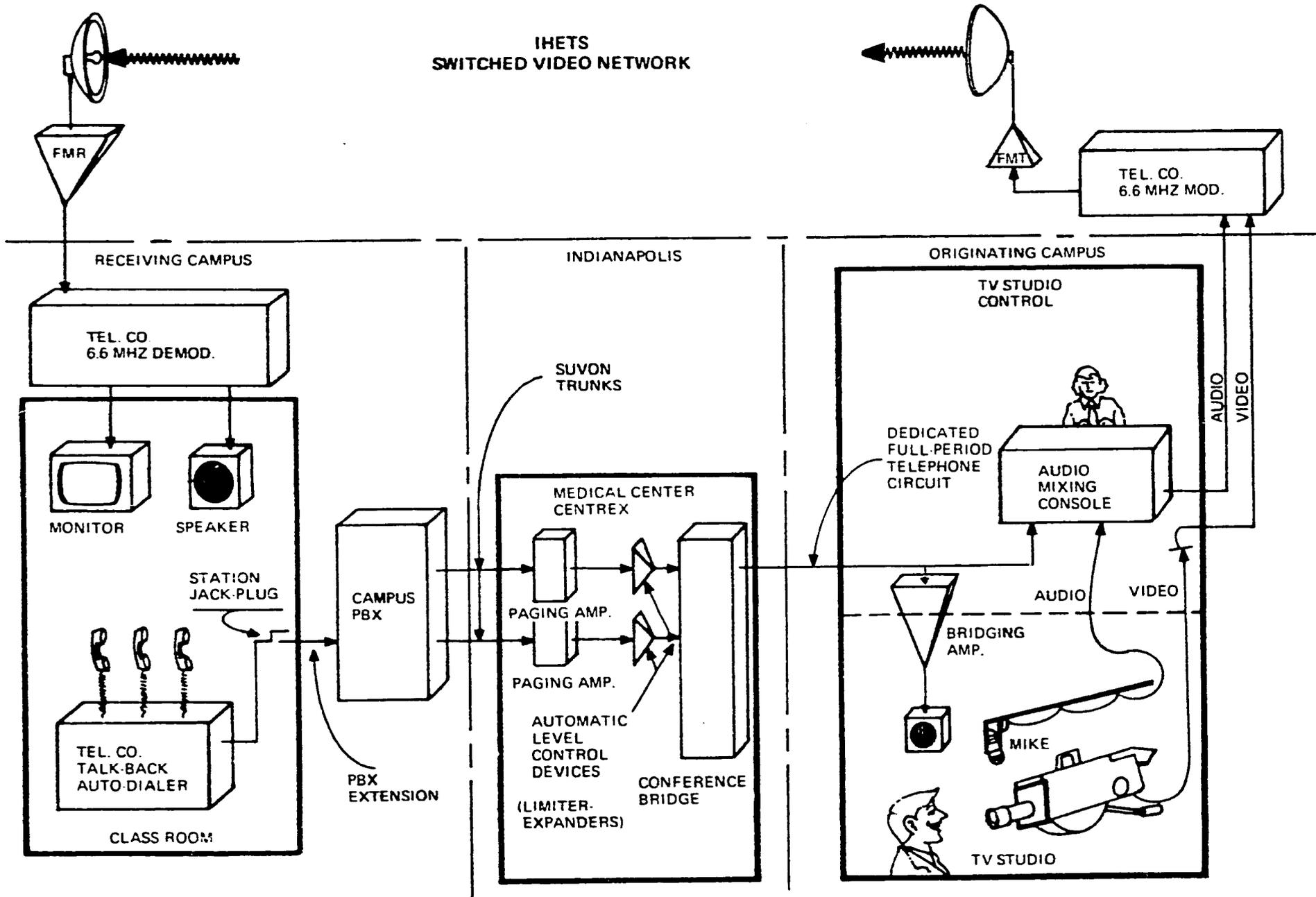
**Talkback** — Consult the schematic diagram on the following page.

At left, in the receiving classroom, student questions are fed from the dialer into a station-jack for the telephone extension phone in the room. This extension enters the campus PBX, and the dialer seizes a SUVON line to Indianapolis (center).

At Indianapolis, in the Medical Center Centrex, incoming talkback calls ON ONE OF THE TWO POSSIBLE TALKBACK LINES first enter a paging trunk which gives back either a "busy" or a "beep." Then the calls pass through an automatic level control device and into a telephone CONFERENCE BRIDGE which mixes the two incoming lines and feeds both calls along a FULL PERIOD INTERCITY TELEPHONE CIRCUIT to the originating campus and directly into the TV studio.

In the studio, the incoming calls are fed directly into the audio mixing console and mixed with program audio. They also feed through a BRIDGING AMPLIFIER (which permits separate

IHETS  
SWITCHED VIDEO NETWORK



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level control for program audio and for studio talkback sound) into the studio floor speaker, from which the professor hears the questions. The levels in the studio and on the studio floor are adjusted to permit the hearing of questions and the answering via program microphones without generating feedback.

Then student questions and professorial answers are routed via the switched video network back to the receiving classroom monitor speaker.

**Computer Data** — As mentioned above, SUVON is capable of carrying computer data transmissions to a limited extent. The limitation is that of band width. A standard telephone voice-grade circuit has a nominal frequency band width of 300 to 3,400 cycles.

The speed with which data (or indeed any on-off signaling) can be conducted over a channel is directly proportional to the width of that channel. In the present state of telephone transmission art, and with existing forms of transmission, the practical limit on computer data speed over SUVON circuits is about 8,000 bits per second.

Many kinds of computer-to-terminal transmissions are possible within this range. It is possible, for example, with suitable terminal gear on each end of a line, to subdivide, electronically, a voice channel into many teletype channels. The teletype is still the most common and inexpensive kind of computer terminal available.

**Teleprocessing** — For some time it has been evident that there exists with regard to the use of the switched video network the same kind of dynamic that affects the use of telephone circuits, to wit: traffic does not flow over the video network evenly, but in peaks which correspond to the most common hours of instructional activity. In other words, everybody wants to use television from 10 to 11 A.M. on Monday-Wednesday-Friday, and very few people want television (or any other kind of class) at 8 A.M.

The situation is somewhat more complex than that, of course, because the transmission schedules of the medical television unit and of the Public Broadcasting Stations differ from the schedules of instructional television, but the peaks are still a matter of record and a source of conflicts between originators.

The SUTCC had the wisdom to establish the switched video network with multiple lines to many points. Had they not done so, the problems of scheduling would already have become crippling. Yet, as it is, they can be described as troublesome.

It is evident that, for reasons of economy, we cannot provide numerous parallel video circuits to all utilization points as we have in the case of telephone circuits. Hence, the switched video network cannot be "engineered to handle the

peaks" as the SUVON network is. Other means must be employed to ease the pressure of competing requests for the same peak hours of video network time.

An examination of the program log reveals that approximately 40% of the video instruction being transmitted is not live but played back from tape. Such pre-recorded programs can be delivered to users as well by sending them on ahead to the receive location in advance of class time. These ahead-of-time transmissions will usually occur late at night or, in any case, at a time when the network is little used. The end object of this activity is to free the network for "live" productions, especially those involving TALKBACK, which, necessarily, must be transmitted simultaneously with their studio occurrence.

Accordingly, we are installing at the receiving campuses the capability of prerecording, through the remote operation of unattended small-scale video tape machines, any programs that do not need to travel "live." This capability we have named TELEPROCESSING, since it is potentially capable of handling not merely video signals but other kinds of instructional or administrative transmissions as well.

The mechanics of the TELEPROCESSING system are conceptually simple, though they utilize the most advanced and sophisticated electronic techniques.

In brief, an ENCODER employing computer logic circuits is used to generate signals capable of addressing any individual decoders at the locations specified. The decoders translate the coded signals into functions of the videotape recorder such as PLAY, ON, RECORD, OFF, and REWIND. At slack periods on the video network, programs intended for use at a later time may be transmitted to their appointed destinations, there to be recorded automatically by unattended videotape recorders. The pretaped programs are then played back over the local video distribution system at the required time. The same encoder-decoder signals are employed to remote-start the videotape recorder for replay.

The capability thus developed should ultimately result in more constant utilization of the video network, meaning fewer hours idle time when only a test signal is displayed as well as a reduction in the number of conflicts between originators over particular hours of network time.

**CATV Distribution** — The Michiana Public Television Corporation and IHETS have a contract whereby two channels of video delivered by the intercity video network to the Indiana University South Bend campus are remodulated to channels in the "mid-band" of the television cable spectrum. These "mid-band" signals are then transmitted via

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the local CATV system in South Bend to the University of Notre Dame, Bethel College, St. Mary's University, and to four hospitals in the cities of South Bend and Mishawaka where they are receivable only with a special converter. This arrangement, probably unique, permits the confidential reception of "sensitive" medical television programs on the same physical wire that delivers home entertainment to other patrons.

The equipment required to perform this distribution (in addition to the general plant of the CATV company) consists of a modulator for each channel to be transmitted and a converter for each location to receive. These converters are relatively inexpensive, costing less than \$100.

Similar arrangements are being considered for other cities, including Fort Wayne, Kokomo, and Lafayette.

With the recent promulgation of new cable TV rules by the FCC and the lifting of the "freeze" on cable construction in major market areas, new cable plants may be expected to bloom in virtually every city in the state. Already, 40 communities in Indiana have operating CATV companies. Franchises are being sought in an additional 24, for a grand total of 64 communities now being or soon to be served with cable distribution.

Among these communities are all the cities (save only Westville) where regional campuses now receive IHETS television signals. Many of the remaining communities are located along the routes followed by the switched video network and could be provided with signals directly therefrom, or by other means.

**ITFS** — ITFS (Instructional Television Fixed Service) transmission is via a series of channels in the range of frequencies around 2500 megahertz, devoted to short-range hops disseminating instructional television signals. This service was intended by the FCC to be an expedient for educational use of television pending the growth of cable TV.

IHETS operates only one ITFS system at present. This system, licensed to the trustees of Indiana University, radiates from antennae mounted on the tower of WCAE-TV, the public television station owned by Lake Central High School located at St. John, near Dyer, Indiana.

Its signals, on two channels, are receivable by hospitals in Hammond, by the Purdue University regional campus in Hammond, by the Indiana University campus at Gary, and by the Purdue University campus at Westville.

In Indianapolis, an ITFS system is owned by Indiana University and operated by the Medical Education Resources Program to transmit Continuing Medical Education to physicians in seven Indianapolis hospitals. This system is not con-

trolled by IHETS but is occasionally employed to transmit programs originated by the State Universities.

ITFS is a valuable alternative to other forms of signal delivery, such as telephone company cable or CATV systems (q.v.), and may be employed in the future at other points on the system where it appears to be cost-effective.

**Public Broadcasting** — Indiana has six public broadcasting television stations on the air presently, and a seventh station located in Louisville, Kentucky, serves Indiana with a transmitter in New Albany, Indiana. Three of these stations, WTIU, Bloomington; WVUT, Vincennes; and WIPB, Muncie are at least partially operated, funded, and/or administered by universities. Of the seven stations, all but three, those in Louisville, Evansville, and Indianapolis, are presently connected by the IHETS video network.

There are increasing instances where these interconnected stations exchange programming via IHETS. An illustration of this occurred in 1972 when the Public Broadcasting Stations provided live "gavel-to-gavel" coverage of the State's political conventions via IHETS.

PBS originally provided only a single "drop" in Indiana, to WTIU, Channel 30 at Indiana University in Bloomington. Three public broadcasting stations (WVUT, WIPB, WCAE) received PBS programs from WTIU's "drop" via the IHETS switched video network either "live" at the time PBS fed them or later via a videotape playback. These services were in accordance with the IHETS enabling legislation which anticipated "... a need to provide an interconnection system between a future network of education television stations..." The playbacks were performed free of charge.

With the proviso that it not conflict with any scheduled television, there has been some use of the audio channels of the video network for the interchange of radio programming. This use chiefly comprises play-by-play sports originating with a university station and terminating at commercial broadcast stations in cities having regional campuses. Also, there has been some experimentation with the transmission of other radio programming between one university station and another, but this has been extremely limited.

## EARLY ORGANIZATION

**Formation of the State Universities Telecommunication Coordinating Council (SUTCC)** – The basic legislation directed the State Universities to establish a coordinating unit to administer and supervise the use of the System and to invite the participation of prospective users of the System (including private institutions of higher education as well as other governmental and private organizations) through an Advisory Council. In May and June of 1967 resolutions effecting the legislation were adopted by the Boards of Trustees of the State Universities. These resolutions created the State Universities' Telecommunication Coordinating Council, hereafter referred to as the Council or the SUTCC.

Once formed, the Council was charged to devise a plan for the administration of the Telecommunication Act of 1967, to submit the plan to the Boards of Trustees of the four State Universities for their approval and, once approved by the Boards, the State Budget Agency, the State Budget Committee, and the Governor. Upon approval, the Council was designated to administer the plan for the Boards.

The SUTCC held its organizational meeting on Wednesday, June 14, 1967. At that and subsequent meetings, the SUTCC created various committees and provided for the creation of special task forces. Committees were composed only of SUTCC members, whereas Task Forces consisted of representatives from the various institutions each of whom possessed particular knowledge in a given area. By September of 1967 three Council Committees had formed; there was an Administrative Committee, a Technical Relations Committee, and an Instructional Materials Committee. Task Forces were created in the areas of Voice Network (telephone), Times Scheduling (for video network), Computers, and TV Operations.

Because of the extensive use which medical education was to make of the telecommunication system, the SUTCC invited Dr. George Lukemeyer, Executive Associate Dean of the Indiana University School of Medicine, to meet regularly with the Council; most task forces included Medical School representatives.

The SUTCC drafted an interim operating budget of \$21,500 which was approved by the State Budget Agency; Indiana University was the fiscal agent. These funds allowed the Council to operate through January, 1968, with its Chairman being released one third time from his university post to serve as the acting administrator for the Council.

**Building a Staff** – On November 7, 1967, the State Universities' Telecommunication Coordinat-

ing Council submitted its operating plan to the Boards of Trustees of the four State Universities. This plan budgeted the \$600,000 appropriated for the biennium ending June 30, 1969. By the end of January, 1968, the plan had received the approval of the University Boards, the State Budget Agency, and the Governor; and on February 1, the first Executive Director for the Indiana Higher Education Telecommunication System, Hugh Greene, reported to Indianapolis.

An office for the System was established on the campus of the Indiana University Medical Center, 1100 West Michigan Street. In early March, the Council appointed Mr. James R. Potter as Television Operations Manager for the System; his services were first donated on a part-time basis by Purdue University. However, on September 1, 1968, Mr. Potter left Purdue to accept the permanent position of IHETS Director of Operations.

**Early Role of the Telephone Companies** – During the first two years, the major concerns of the Council and the Staff were matters of hardware and System construction; in large part this required a close interface with the telephone companies. In the Spring and Summer of 1967, the telephone industry worked to expedite its cooperation with the SUTCC in the building of IHETS by forming an inter-company coordinating committee under the chairmanship of Mr. W. C. Homann (Account Manager-Education Market, Indiana Bell Telephone Company). The committee was composed of representatives of the telephone companies, including persons from their engineering, market, plant, and traffic departments.

**The Advisory Council** – The original legislation provided for "an advisory council of representatives of users of the System." On September 24, 1968, this Advisory Council met for the first time at the Indiana University Medical Center in Indianapolis.

Over the years, the Advisory Council has had members representing the following groups and associations:

- Indiana Conference on Higher Education
- Indiana Pharmaceutical Association, Inc.
- Indiana State Bar Association
- Indiana State Chamber of Commerce
- Indiana State Dental Association
- Indiana State Medical Association
- Indiana State Nurses Association
- Indiana Veterinary Medical Association

The Chairman of the SUTCC serves as the prime interface between the System and its Advisory Council. Mr. Robert E. Martin, then of the Education Department of the State Chamber of Commerce, served as the first Chairman of the Advisory Council.

## THE REORGANIZATION

With the System's hardware installed and operating, the concerns of both Council and Staff turned, almost exclusively in 1970, to matters of software and System utilization. With this shift of focus, certain problems of policy making and administrative operation began to surface.

It became apparent that the contribution and assistance of top-level university administration was required if the Council hoped to commit institutional staff and funds to developing inter-institutional software. Extensive discussion and negotiations during 1970-71 led to a reorganization and the adoption of a new set of By-Laws.

**The Board** — During April and May of 1972 the Boards of Trustees of the six member institutions approved a uniform resolution which created the Board of Directors of the Indiana Higher Education Telecommunication System. The Board is the chief administrative body of the System, and it represents the Boards of Trustees in the development of operating policies for the System. It will serve as the sole vehicle through which institutional commitments are made to inter-university projects. Presidents of each institution designate one person (normally, a Vice President) to represent that institution, its president, and its Board of Trustees in respect to network matters.

The current membership of the IHETS Board is composed of the following persons:

Dr. C. H. Lawshe, Chairman (Purdue University)

Dr. J. Bottenfield, Secretary (Vincennes University)

Dr. R. W. Burkhardt (Ball State University)

Mr. W. C. Jackson (Indiana Vocational Technical College)

Dr. J. G. Liebenow (Indiana University)

Dr. M. K. Townsend (Indiana State University)

**The Council** — The same joint resolution which created the Board provided for the continued operation of the State Universities' Telecommunication Coordinating Council (SUTCC). The Council is charged with the responsibility of developing "formal proposals for consideration by the Board of Directors and otherwise to advise on technical and distribution matters, programming, and operating procedures." At its own instance the Council is expected to initiate studies concerning any phase of the System's management, and it has the duty of supervising the large array of interinstitutional panels and conference groups (see below).

Council membership is comprised of three voting members appointed by the President of each member institution plus an additional voting member from the Indiana University Medical

School appointed by the President of Indiana University. The (ex-officio) Chairman of the Council is the Executive Director of IHETS, and he has the responsibility of maintaining a communications liaison between the Council and the Board of Directors.

The following persons are members of the Council:

James R. Boyle (Indiana State University)

K. Gene Faris (Indiana University)

Donley Feddersen (Indiana University)

William H. Hayt, Jr. (Purdue University)

Donald M. Hilt (Indiana State University)

Edward Klinker (Vincennes University)

George Lukemeyer (Indiana University School of Medicine)

James S. Miles (Purdue University)

Robert Miller (IVY Tech)

Joseph Rawlings (Ball State University)

Rufus Reiberg (Indiana University)

O. T. Richardson (Ball State University)

Cornelia Scheid (Vincennes University)

D. Richard Smith (Purdue University)

Robert Stevens (Vincennes University)

William H. Tomlinson (Ball State University)

Carl Ventrone (IVY Tech)

Jane G. Richards, Chairman (IHETS)

**Council Committees** — Three Council Committees are provided for, namely:

1) The Administrative Committee

2) The Program Development Committee

3) The System Development Committee

Each Committee, whose function is suggested by its descriptive title, annually elects its own chairman.

**Panels and Conference Groups** — The 1971 By-Laws provided for the dissolution of Task Forces, Planning Groups and *ad hoc* teams; taking their place are Panels and Conference Groups which are modeled upon the operation of the Committee on Institutional Co-Operation of the Big Ten Universities and the University of Chicago. A 1972 revision of the By-Laws sustained the operation of these groups.

Of the two, the Panel is the more formal and structured. A Conference Group can be formed simply by obtaining the consent of the Council and the Council Chairman; a Panel's formation requires formal establishment by the Board of Directors.

The optimal number of persons necessary to accomplish the task comprises the membership of a Panel or Conference Group. One could have Council members, staff, university personnel, consultants, engineers, and citizens all serving on the same group; indeed, such a diverse collection is often necessary to the task in the case of interinstitutional activities.

Two types of Panels are used: Regular and Advisory. Regular Panels are *ad hoc*, task-oriented groups which "conduct specific studies, projects, or programs as defined by the Council." Regular Panels draw up a specific written proposal that will generally circumscribe their activities and once the proposal is approved, proceed to implement it. Regular Panels continue to exist until their assignments are completed and their final report is accepted by the Council. Advisory Panels, on the other hand, are on-going groups with more or less permanent advisory functions. They operate in areas which require the successive application of specialized expertise to coordinate on-going interinstitutional efforts. Advisory Panels continue to exist until they are reconstituted or disbanded by Council action.

Conference Groups are quite informal. They gather to conduct preliminary explorations regarding project plans. If they develop a specific proposal and it is ratified by the Council, Conference Groups may then be converted into Panels by action of the Board.

The purpose of having numerous Conference Groups is to permit the interinstitutional exploration of as many subjects and areas as is feasible. Semi-formal Conference Groups can gather on their own initiative and with the approval of one person, the Council Chairman, proceed to discuss, investigate and analyze projects. It is hoped that a great number of Conference Groups can be formed even if only a relative few bear fruit.

As of January 1, 1973, the following Panels, Advisory Panels, and Conference Groups were in existence:

#### Panels

Family Law Panel  
Indiana History Panel  
Non-West Studies Panel  
Nurses and the Law Panel

#### Advisory Panels

Continuing Education Advisory Panel  
Engineering Design and Specifications Advisory Panel  
Network Coordinators' Advisory Panel  
Public Broadcasting Advisory Panel  
Radio Station Advisory Panel  
Registrars Advisory Panel  
Television Production Advisory Panel  
TV System Scheduling Advisory Panel  
Voice Network Advisory Panel

#### Conference Groups

African Studies Conference Group  
Afro-American Studies Conference Group  
Computer Conference Group  
Ecology Conference Group

Nursing Continuing Education Conference Group  
Outside Grants Conference Group  
Psycho-Social Aspects of Nursing Conference Group  
Research and Evaluation Conference Group  
Special Education Conference Group

A compilation of the charges, as well as a list of the members, for each of these groups is available from the IHETS Office in Indianapolis.

## THE CURRENT IHETS STAFF

A Staff is employed by the Council and the Board to manage the day-to-day activities of the System. This Staff uses a collegial style of management within which Staff members share responsibility in specific tasks when this is appropriate. Further detailed information on Staff organization and the duties of individual members may be obtained by writing the IHETS Office.

### The IHETS Office: 1973

#### Location:

Bowers Building (Patterson Street entrance)  
Indiana University Medical Center  
1100 West Michigan Street  
Indianapolis, Indiana 46202

#### Office Hours:

8:00 a.m. – 5:00 p.m. (Monday thru Friday)

#### Phone Number:

(317) 264-7945

#### Administration:

SUVON Ext.

Dr. Jane G. Richards, Executive Director 7945

Victor F. Clark, Director of Administrative Services 7945

James R. Potter, Director of System Operations and Development 7945

Randall G. Bretz, Media Utilization Specialist 7945  
Carole M. Allen, Administrative Assistant

#### Operations:

David M. Wilson, Asst. Director of System Operations and Development 7945

Elmer E. Walls, Chief Engineer 7945

Jerome "Ski" Kowalski, Network Control Supervisor 7945

June P. Williams, Traffic Coordinator 7945

## UTILIZATION OF IHETS

There were no system-wide records kept of early video network utilization. Statistical data recorded since September of 1970, however, indicate a steady increase each semester in system use for credit and continuing education programs.

Total student hours of instruction and enrollments are two measures being employed to deter-

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mine system use. Records for these semesters indicate marked increases in utilization:

	Fall, 1970	Spring, 1971	Fall, 1971
Student hours of Instruction	54,034	272,006	681,850
Student Enrollments	2,228	3,785	5,569

Reports from these three semesters show that the greatest increases in utilization have occurred in the area of continuing education programs:

#### Recorded Enrollments

	Fall, 1970	Spring, 1971	Fall, 1971
Non-Credit	607	1,875	3,182
Credit	1,681	1,610	2,387

**Video Utilization: Various Types** — Many organized professionals have used the IHETS facilities to transmit statewide educational programs: accountants, attorneys, businessmen, chemists, clergymen, dentists, engineers, farmers, in-service teachers, nurses, nursing home administrators, pharmacists, physicians, public relations personnel, real estate salesmen, speech therapists, university administrative personnel, university alumni, university physical plant personnel, and veterinarians. Primarily, programming for these persons has been non-credit.

Serving these specialists is in keeping with the preamble of the IHETS legislation which calls for a network to serve the main and regional campuses of the State Universities as well as the concerns of medical education. It speaks of "extending and continuing education . . . to update, retrain, and otherwise bring rapidly advancing knowledge to those who need it in their daily pursuits." The preamble also mentions vocational and technical training; updating and retraining in supervisory, production, and management skills; and serving private institutions of higher education.

**Video Utilization: Credit Programs** — Credit programs for both undergraduates and graduate students have been a primary mission of the System since its inception. The subject matter of these courses has covered the range of higher education offerings. A look at the Spring, 1972, program schedule provides a good example of the variety of programming: music appreciation, mass communication, agriculture, astronomy, nursing, and dental hygiene. At the graduate level, we find: electromagnetic field theory, statistical communication theory, education, Non-West Studies, home economics, and business policy.

The astronomy course of Dr. Frank Edmundson of Indiana University is an illustration of how a scarce resource (in this case, an eminent astronomer) can be shared with six different campuses. The course on the History of American Social Welfare is an example of a regional campus location

providing instruction for use at a main campus.

It should be noted that the major originators on the System are Indiana University, Purdue University and the Medical Center in Indianapolis.

Of the regional campuses receiving programming, Fort Wayne, South Bend, and Indiana University/Purdue University Indianapolis usually record the largest use by hours received and by the number of students enrolled. Lafayette and Bloomington are also major users of continuing education programs where they serve as receive locations for programs produced by other institutions.

**Video Utilization: Interinstitutional Cooperation** — A fourth area of programming lies in the development of interinstitutional credit and continuing education programs. Among the first of these is the dual-level education course, *Non-West Studies: East Asia*. This credit course, designed primarily as an in-service offering for teachers, was developed over a period of nearly two years. From an idea originating with Dr. C. W. Engelland of Indiana State University, an interinstitutional Conference Group was formed in the Summer of 1970. This group, with the assistance of Dr. Jane Richards (then of Indiana State University), pioneered in the development of interinstitutional policies and procedures needed to implement the concept.

Spring, 1972, saw the initial offering of this course, which marked the first time that Hoosier students could take a credit course at any main or regional campus and receive credit from any one of four participating universities. Currently in production are two similar interinstitutional courses: one deals with Nurses and the Law (non-credit) and the other with Family and Consumer Law (credit).

As of Fall, 1972, there are several other groups investigating the possibilities of interinstitutional courses either for credit or continuing education: Afro-American Studies, Indiana History, Psycho-Social Aspects of Nursing, and Ecology.

In addition, the managers of the State Universities' radio stations have been meeting, and an exchange of credit-by-examination courses for radio is anticipated. The Continuing Education Advisory Panel has expressed its support for audio-only projects.

**Existing Policies for Interinstitutional Cooperation** — The term "interinstitutional project" refers to all programming and course material carried on the System which has been developed by two or more institutions working in concert. The basic mechanism for researching and developing the course content begins with the creation of a Conference Group. Once the institutions have agreed to effectuate the recommendations of a Conference

Group, an interinstitutional Panel is formed to develop and budget the actual course.

The policies which govern and permit the creation of Panels and Conference Groups are contained in the By-Laws, in Council Document 71-3, and in Council Document 71-6: Revision 4. Copies of these Documents are available from the IHETS Office.

When the Council and the Board have agreed to develop a course as outlined by the Panel's recommendations, other interinstitutional policies apply. The interinstitutional operational procedures referred to are contained in three additional documents:

1. CD 71-4: *The Continuing Education Facilities Agreement* (Pertaining only to non-credit courses).
2. CD 71-16: *Policies Relating to the Development, Budgeting, and Distribution of Costs for IHETS Inter-Institutional Credit Courses.*
3. CD 71-21: *Policies Relating to Fees and Registration for IHETS Inter-Institutional Credit Courses.*

These documents specify procedures to be followed in respect to enrollment on the various campuses, collection of fees by the receiving campuses, recovery of costs, providing library materials, financing a syllabus, responsibilities for scheduling, designation of an academic agent, designation of a production agent, assignment of responsibilities when talkback is to be employed, and procedures to be used in publicizing the course.

**Cost Aspects** – Given the fixed cost character of the hardware components of the System, it stands to reason that usage-unit cost of the System will decline as utilization increases. Indeed, the Board and the Council are most concerned with increasing the level and the quality of System utilization. Under all circumstances, this is bound to involve expenditures of money on the part of the universities in addition to those funds which the State provides to maintain and operate the System. The IHETS legislation specifically prohibits using appropriated monies for television production.

## THE FUTURE

**The Fourth Revolution** – Among the major concerns of the recent Carnegie Commission report on instructional technology (*The Fourth Revolution*) was an attempt to assess the impact which communications technology will continue to have on higher education. The findings of that Commission suggest a bright future for mediated instruction not just in higher education, but in elementary, secondary, adult, and continuing education as well. The Commission found:

- that higher education (and education generally) now faces the first great technological revolution in five centuries in the potential impact of the new electronics.
- that instead of replacing earlier forms of instruction, the new technology is providing a supplemental and valuable alternative to older approaches – just “as the teacher once added to what the family could offer, as writing then added to oral instruction, as the book later added to the handwritten manuscript.”
- that by the year 2000, it appears that a significant proportion of instruction in higher education on campus may be carried on through instructional technology – perhaps in a range of 10 to 20%. It will certainly penetrate much further than this into off-campus instruction at levels beyond the secondary school – in fact, it may become dominant there at a level of 80% or more.
- that better than ever before, it can bring education to the sick, the handicapped, the aged, the prisoners, the members of the Armed Forces, persons in remote areas, and to many adults who could attend classes on campus, but who would find instruction at home more convenient.
- that the new technology will also tend to draw instruction from the historical requirements-met-through-teaching approach to resources-available-for-learning approach; and this can be a fundamental change.

**Indiana Commission for Higher Education** – The preliminary draft of the *Indiana Plan for Post-Secondary Education: Phase I* also highlights the role of instructional media in the future of Hoosier higher education. The Commission noted that “potential economies may exist in expanded use of the Indiana Higher Education Telecommunication System, coordinated academic calendars, shared use of libraries, computers and other resources, and contractual agreements for instructional programs.” Among other encouraging

statements, the Commission also suggested:

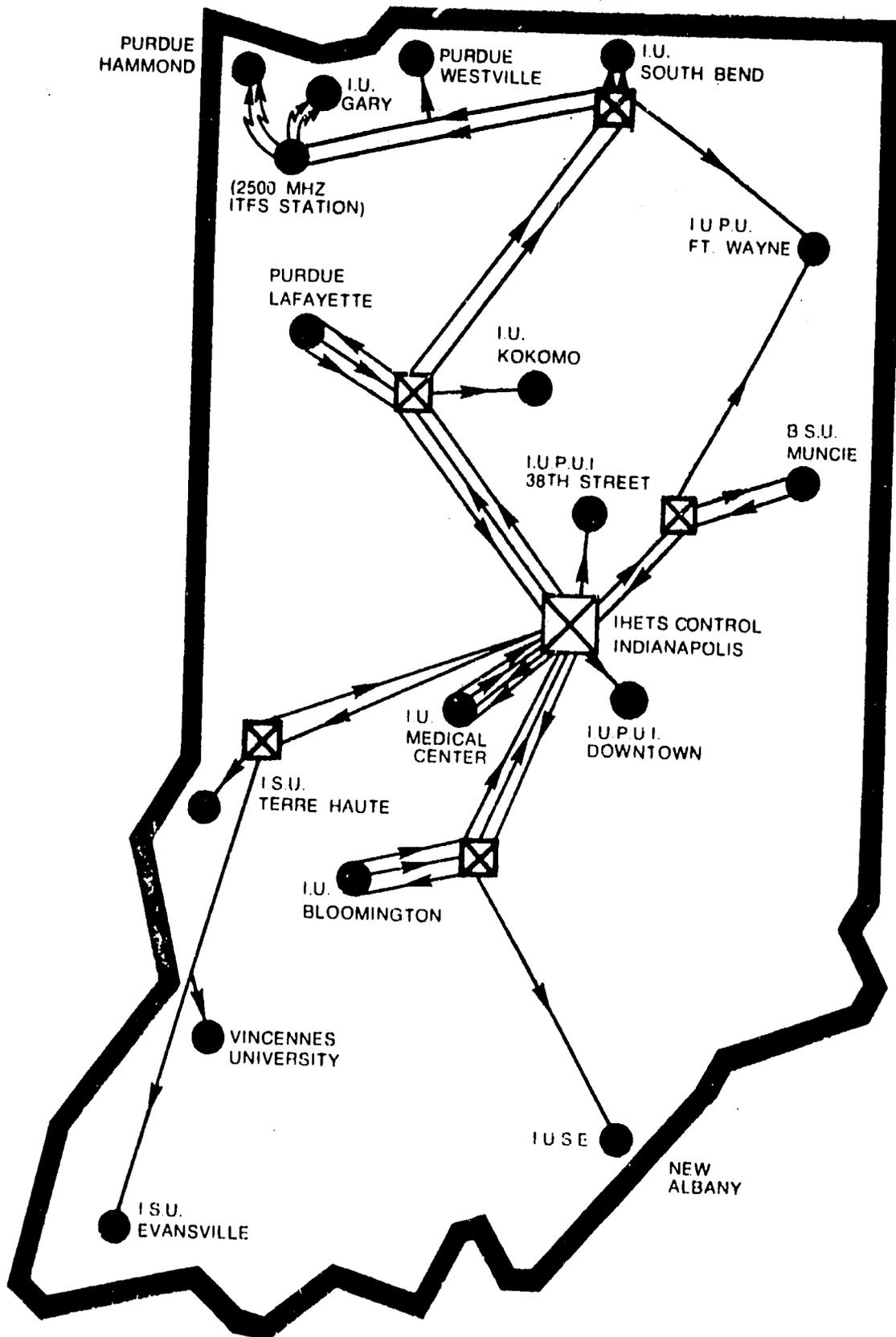
- that the State system search for new and innovative ways to provide post-secondary opportunities for the citizens of Indiana.
- that educational television facilities, independent study, and tutorials are ways by which external degree programs may be developed.
- that post-secondary occupational programs should be made available through a dynamic and flexible system capable of adapting its educational offerings to meet the changing technological needs of the State.
- that the General Assembly provide program funds to be used only for the development of joint and instructional programs among three or more institutions, and not to be used for equipment lease or purchase.

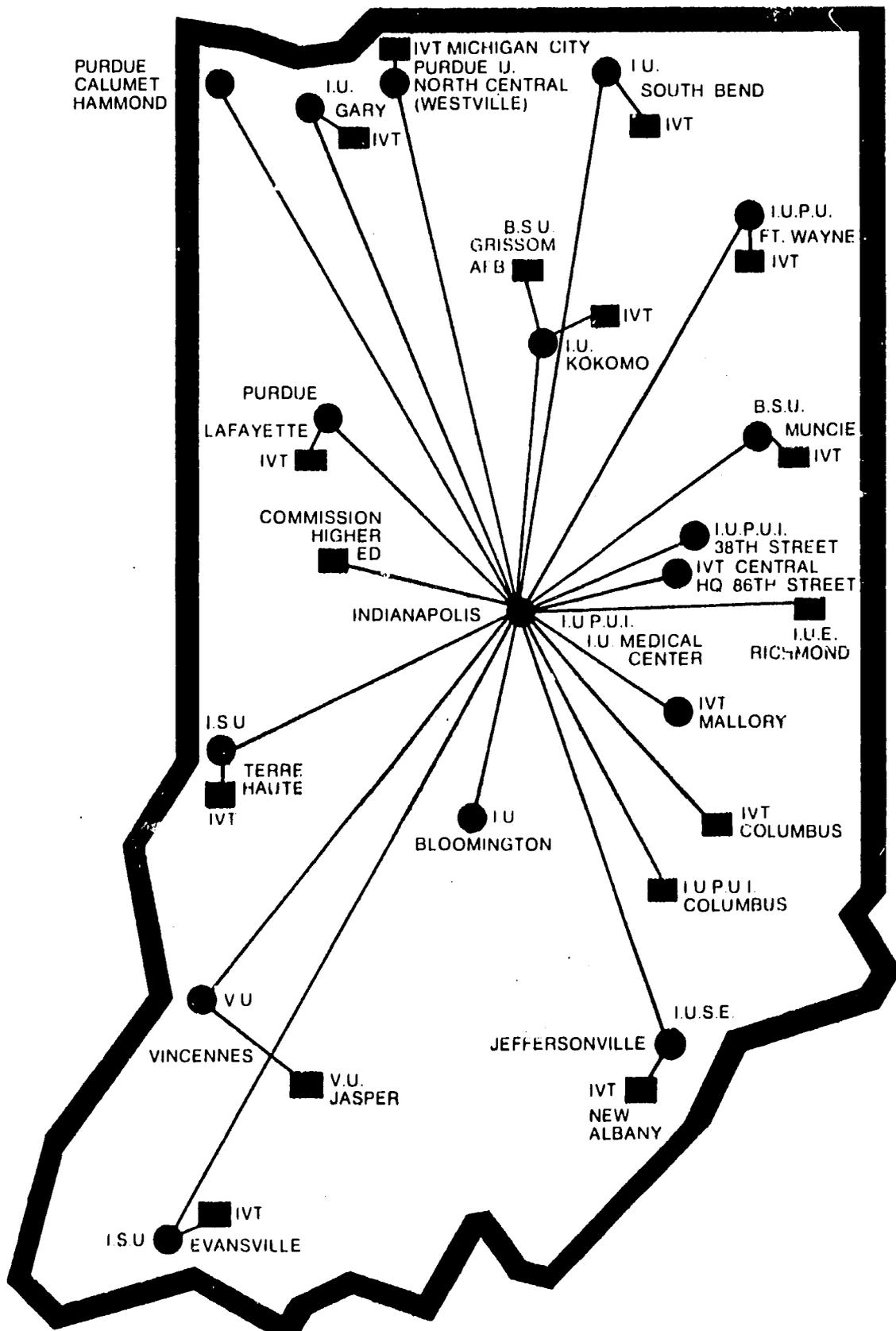
Further, the Commission asked the Board of Directors to continually apprise the Commission of its current program and future plans. It has asked the Board to develop a Long-Range Plan for the future development of IHETS which would implement the objectives of the entire statewide plan as developed by the Commission. Additionally, the Commission mentioned "including greater participation in cooperative programs among public and independent institutions."

**Ad Hoc Committee on Long-Range Planning** — In view of this encouraging future, the Council undertook, early in 1972, to develop a five-year plan for the evolution and growth of the System by creating an *ad hoc* committee on Long-Range Planning. Chaired by Dr. D. Richard Smith of Purdue, the Committee collected information on educational needs, technological and educational trends, and fresh options for maximizing the utility of the System in the interest of greater service to Hoosier citizens.

APPENDIX A

FULLY-SWITCHED MULTI-POINT VIDEO NETWORK  
OF THE INDIANA HIGHER EDUCATION TELECOMMUNICATIONS SYSTEMS





● INDICATES A UNIVERSITY CENTREX OR PBX  
 ■ INDICATES AN OFF-PREMISE EXTENSION  
 IVT INDICATES VOCATIONAL TECHNICAL COLLEGE REGIONAL CENTER

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## APPENDIX C

## CHAPTER 358

[H. 1819. Approved March 11, 1967.]

AN ACT concerning the use of a state-wide telecommunications system by Indiana University, Purdue University, Indiana State University and Ball State University, permitting the use thereof by others, making appropriations in connection therewith, and declaring an emergency.

WHEREAS, there is a need for a state-wide communications system interconnecting the campuses, both main and regional, of Indiana University, Purdue University, Ball State University and Indiana State University to permit the sharing of educational resources between the four universities and between main campuses and regional campuses; and

WHEREAS, there is a need for a state-wide medical educational communications system interconnecting cooperating institutions for direct teaching of internes, residents, senior clinical and practicing physicians through continuing education in at least fifteen population centers in Indiana; and

WHEREAS, there is a need for extended and continuing education over the entire state to up-date, re-train and otherwise bring rapidly advancing knowledge to those who need it in their daily pursuits; and

WHEREAS, there is a need for extended vocational and technical training throughout the state by Indiana Vocational Technical College or other appropriate agency for post-high school students whose need must be satisfied if they are to take places commensurate with their native ability in an economy which needs their trained skills; and

WHEREAS, there is a need for up-dating, re-training and otherwise making new and advanced knowledge available to the work force of Indiana in all lines of endeavor, in production skills, supervisory skills, management skills and related human talents; and

WHEREAS, there is a need for sharing educational resources between public and private institutions of higher education in Indiana and thereby to multiply the utilization of the total investment in higher educational resources in Indiana; and

WHEREAS, there may be a need to provide an interconnection system between a future network of educational television stations over which a full schedule of educational broadcast services could be brought into the homes, factories, businesses and schools of Indiana; and

WHEREAS, there is a need to be of special service to the secondary and elementary schools of Indiana supplementing already existing services and bringing the special resources of higher education to the public schools, now therefore

*Be it enacted by the General Assembly of the State of Indiana:*

SECTION 1. The Trustees of Indiana University, The Trustees of Purdue University, Ball State University Board of Trustees and Indiana State University Board of Trustees (hereinafter referred to collectively as the "State Universities") are hereby authorized, if they find the need exists therefor in order to provide for a broad dissemination of a wide variety of educational communications for the improvement and the advancement of higher educational opportunity, to jointly arrange from time to time for a period not exceeding ten years for the use of a multi-purpose, multi-media, closed circuit, state-wide telecommunications system furnished by Communications Common Carriers subject to the jurisdiction of the Public Service Commission of Indiana to interconnect the main campuses and the regional campuses of the State Universities, and centers of medical education and service. Such system shall be for the exclusive use of the State Universities; provided the State Universities may permit the use of the system or any portion thereof by others as provided in Section 4.

SEC. 2. Such transmission system shall be so designed as to permit the installation of additional capacity and coverage as accumulating communication needs of higher education may require. Such system shall be capable of transmitting high-fidelity television signals, high-fidelity sound signals, data signals for computer communications, as well as voice traffic, and shall include control circuits. The arrangements for the use of such system may be upon such other terms and conditions as the State Universities deem necessary, proper or desirable. No plan or arrangements for the use of such telecommunications system shall be adopted or entered into pursuant to the provisions of this act without the specific approval of the governor, the state budget committee and the state budget agency.

SEC. 3. The State Universities shall establish a coordinating unit or other body composed of such persons as they may determine, which committee or other body shall have such powers to administer and supervise the use of such transmission system as may be from time to time delegated to it by the governing boards of the State Universities. The State Universities shall have equal representation on such coordinating unit or body. There shall also be an advisory council of representatives of users of the system.

SEC. 4. Any arrangements for the use of such telecommunications system shall provide that the State Universities, or any committee or other body established pursuant to Section 3 if the power is so delegated to them, may permit any other institution of higher education, or any other governmental or public corporation or body, or any other corporation, individual, partnership, association, trust or

other person to use such telecommunications system or any portion thereof for educational purposes, subject to such rules, regulations, fees and charges as such State Universities, committee or other body may prescribe. Each State University or Universities or any other person or persons using the system shall have the responsibility for the origination of the program to be transmitted by it or them and of the reception and utilization of the program at the destination. The payment of all costs thereof in excess of the cost of the use of the system facilities shall be borne by the parties using the system as agreed upon.

SEC. 5. In connection with the use of such telecommunications system or any matter relating thereto, the State Universities shall have the power to accept gifts or contributions from individuals, corporations, partnerships, associations, trusts, or foundations and to accept funds on such terms and conditions as the State Universities deem necessary or desirable from the United States of America or any agency thereof and the State Universities shall have the power to enter into and carry out contracts and agreements in connection with any of the foregoing.

SEC. 6. A special and distinct fund is hereby created to be known as the "Higher Education State-Wide Telecommunications Fund." Expenditures from the fund hereby created shall be made only for payments by the State Universities for the use of a telecommunications system as provided in this Act, for studies regarding the possibilities of extending the use of the system to other colleges and universities in the state and of the possibilities of extending the use of the system for post-high school and other educational uses, for the expenses of coordinating, planning and supervising the use of the telecommunications system, and for equipment for the originating and receiving of instructional communication and educational information by means of such telecommunications system. The state auditor shall pay, as needed, from time to time from such fund amounts to The Trustees of Indiana University as agent for the State Universities and The Trustees of Indiana University as such agent shall apply the same to the payment of items as they fall due which are payable from the Higher Education State-Wide Telecommunications Fund.

SEC. 7. There is hereby appropriated to the Higher Education State-Wide Telecommunications Fund from the General Fund of the State of Indiana from funds not otherwise appropriated the sum of \$600,000 for the biennium ending June 30, 1969.

SEC. 8. WHEREAS an emergency exists for the immediate taking effect of this act, the same shall be in full force and effect from and after its passage.

L O N G   R A N G E   P L A N  
F O R  
T H E   I N D I A N A   H I G H E R   E D C A T I O N  
T E L E C O M M U N I C A T I O N   S Y S T E M

Submitted to the  
HIGHER EDUCATION COMMISSION  
OF INDIANA

by

The Board of Directors  
INDIANA HIGHER EDUCATION TELECOMMUNICATION SYSTEM

April 1, 1973

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LETTER OF TRANSMITTAL

To the Commission on Higher Education  
of the State of Indiana

Presented herewith is the Long Range Plan for the Indiana Higher Education Telecommunication System as requested by the Commission. As detailed in the narrative, the intensive work of a Long Range Planning Committee preceded the preparation of the plan. All six state institutions participated in its development and the plan as it is being submitted was formally adopted by the Board of Directors at its meeting on March 9, 1973.

Respectfully submitted

C. H. Lawshe, Chairman  
Board of Directors  
INDIANA HIGHER EDUCATION TELECOMMUNICATION SYSTEM

April 1, 1973

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LONG RANGE PLAN  
FOR  
THE INDIANA HIGHER EDUCATION TELECOMMUNICATION SYSTEM

The Indiana Plan for Postsecondary Education: Volume II, requested the Board of Directors of the Indiana Higher Education Telecommunication System (IHETS) to:

"...continually apprise the commission of its current programs and future plans...develop a long range plan for the future development of IHETS which will seek to implement the objectives of their state-wide plan, including greater participation in cooperative programs among public and independent institutions, for submission to the commission for review and adoption no later than March 1, 1973."

The plan presented herewith is forwarded by the Board in response to this request. In order to better understand the plan, a brief look at the legal basis of IHETS and its management is in order.

Background

The Indiana Higher Education Telecommunication System (IHETS) was created following legislation adopted by the 1967 General Assembly which authorized the four state universities to "jointly arrange ..for the use of a multi-purpose, multi-media, closed circuit, state-wide telecommunication system...to interconnect the main campuses and the regional campuses of the state universities, and centers of medical education and service." Subsequently, the General Assembly acted to include Vincennes University and the Indiana Vocational Technical College.

IHETS is managed by a six member Board of Directors, consisting of one vice president appointed by the president of each public institution and designated to represent the president and institutional board of trustees on network and related matters. The IHETS Board employs an executive director who functions as the chief operating officer. An advisory body, the State Universities' Telecommunication Coordinating Council (SUTCC), is composed of nineteen specialists from the participating institutions (three per institution plus one representative of the IU Medical Center) and makes recommendations to the Board on (1) technical and distribution matters, (2) programming, and (3) operating procedures.

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IHETS has passed through two development stages and is now in its third:

- Stage 1: The Conceptualization Stage during which the design and technology for the System was conceived.
- Stage 2: The System Building Stage, including not only the hardware of the System but appropriate policies and procedures as well.
- Stage 3: The Utilization Stage which has allowed for capitalizing on the initial investment in a variety of valuable educational and communications services; as the System moves forward in this stage increased utilization requires additional funding, thus funding should be looked on in the light of the initial capital investments required in stages 1 and 2.

### Planning for the Future

Prior to the Commission's September 1972 request for a plan, the SUTCC had authorized the naming of an interinstitutional Long-Range Planning Committee. This committee came into being March 1, 1972, with Dr. D. R. Smith of Purdue as chairman (he is currently chairman of the SUTCC's Program Development Committee). Each state institution holding membership on the IHETS Board designated an individual to serve on this committee, and in addition Dr. George Lukemeyer, head of Indiana University's Medical Education Resources Program, Dean Darrell Criss of Rose Hulman Institute, and James Potter of the IHETS staff were named. Dean Criss had served as a representative of the state's private institutions of higher education on the IHETS Advisory Council and was selected to represent this constituency on the Long-Range Planning Committee. This committee with representatives of IHETS' current and potential users was charged with forwarding to the Board of Directors those findings it felt should be brought to its attention in order for IHETS to better serve "the State of Indiana in the coming years."

The Committee labored diligently from March 1 to October 1, 1972, and presented its findings\* to the SUTCC and the IHETS Board. These findings and recommendations were then reviewed institutionally and accepted by the SUTCC.

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\* Copies of the Long-Range Planning Committee's Report and supporting documents are available upon request at the IHETS office, 1100 West Michigan Street, Indianapolis, Indiana 46202.

## SECTION A: BASES FOR THE PLAN

The intensive studies initiated by IHETS along with the priorities which emerged have provided an excellent point of departure for reacting to the Commission's request. Bases of the resulting plan are presented in this section and five succeeding ones, one for each biennium.

General Conditions

There are five general conditions which have guided the preparation of this plan.

1. There is a general trend indicated in nationwide instructional television research showing an annual increase in usage of telecommunications at the post-secondary level.
2. The research in innovation and change and its adoption in the field of education shows especial increases in implementation when the new is demonstrable and close at hand ...as it is in the case of this statewide telecommunication system.
3. There is an overall development of sophistication in telecommunication tools and in their educational application which makes utilization more simple, more accessible, easier to use, and more reliable, ...all of which can be shown to stimulate increased usage.
4. The IHETS staff's experience with interinstitutional programming and with planning (conference) groups shows a consistent pattern of increased interest and use in all aspects of the System.
5. There has been an annual increase in the use of the System by vocational interest groups as well as a repeated use by the same interest group.

Many of the recommendations are directed toward the institutions themselves and consist of steps to be taken unilaterally and collectively by each institution functioning under its autonomous board. In some instances the steps to be taken consist of minor policy changes without budgetary implications; other changes will necessitate a reshuffling of university budgetary priorities. Some of the recommendations are directed towards changing the policies and procedures of IHETS itself. While some can be accomplished without additional costs, others have direct budgetary implications. In specific terms these actions are designed to implement the following Long-Range Goals and their indicated priorities.

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Highest Priority

Increase the quantity and improve the quality of educational materials available for use on the System.

Highest Priority

Improve internal and external communications and information flow regarding the System.

High Priority

Increase the flexibility and versatility of the present System by improving its internal facilities and procedures.

High Priority

Increase the System's service potential by extending its external reach for purposes which promise educational benefits for the people of the state.

High Priority

Develop, implement and improve those policies under which IHETS may most effectively function.

High Priority

Take all necessary steps to assist the Medical Education Resources Program of the Indiana University School of Medicine to reach its communication objectives in the Statewide Medical Education Program.

Planning Constraints

Estimating the precise budgetary requirements over a ten year period is hampered because of many unknowns. Some of these are:

- Precise number of reception points required
- Precise number of origination points required
- Future telephone rate increases
- Rate of inflation
- Growth in programming of public radio and television
- Growth of CATV systems and their use by IHETS

Additional uncertainties, some less tangible, also have a bearing on the nature and rate of development:

1. While the use of the System is increasing, the rate of increase through each biennium is unknown.

2. It is impossible to assess the role and the economic impact of the changes in technology upon the budget...for example that of computer-assisted instruction, the use of satellites, cassette development, and equipping for color.
3. At this point it is impossible to predict the rapidity of growth and use of the System by the Indiana Vocational Technical College.
4. It is impossible to predict the System's obligation to private colleges and to elementary and secondary education for the next ten years.
5. The amount of encouragement given interinstitutional cooperation by the institutions, themselves, and by the Commission on Higher Education would directly influence System growth.
6. A factor always to be considered in cost prediction is the quality and reliability of services desired; this must be determined as the program progresses.
7. An additional variable is the number of cities that will need local distribution and the needs of the smaller cities.
8. The more ways in which intra-city systems are expanded, the more likely is usage to increase, although a portion of this expansion would undoubtedly mean duplication and increased cost (i.e. ITFS and CATV). The unknown, which of these options would be followed...or both.
9. IHETS is dependent upon the philosophy of the user; an increase in import of telecommunications would bring about the need for additional services of the staff and the System.
10. The growth of an open university concept would greatly change predictions of the amount and type of System utilization.

#### Actions to be Taken

The following plans for each of the five bienniums have been developed within these considerations and constraints. Annually, or biennially, they will need to be assessed and, if necessary, revised. Each biennial plan identifies those actions to be taken:

- By the Indiana General Assembly
- By the IHETS Board and Staff
- By individual member institutions of IHETS

The Impact of IVTC

Original appropriations for the creation and operation of the System were made when only the four state universities were involved. On this basis, service to 14 centers was provided. When Vincennes University was subsequently added there were no major budgetary problems. Most recently, however, the General Assembly has added the Indiana Vocational Technical College; this imposes a requirement to add some 13 additional centers. This need can be met only (1) through increased appropriations, or (2) a major reduction of service to the original participants.

Appropriations Requirements

Those actions proposed to be taken by the Indiana General Assembly are principally appropriation actions. Proposed appropriations are as follows:

<u>Biennium</u>	<u>Maintenance of Operations</u>	<u>System Improvement</u>		<u>Total</u>
		<u>IVTC</u>	<u>Other</u>	
1973-75	\$2,545,340	\$80,126	\$371,150	\$2,996,616
1975-77	2,626,790	313,304	751,852	3,691,946
1977-79	2,710,847	298,048	855,505	3,864,400
1979-81	2,797,594	293,714	1,045,989	4,137,297
1981-83	2,887,117	296,407	1,239,054	4,422,578

Full details are presented in the ten year budget projections in ATTACHMENT A. Any deviation between actual appropriations and those proposed will, of course, alter these plans.

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SECTION B: FIRST BIENNIUM (1973-75)

It is recommended that during the 1973-75 biennium the following steps be taken:

A. Actions to be Taken by the Indiana General Assembly -

1. Fund the IHETS request for \$2,996,515.00, including the extremely important \$200,000.00 for interinstitutional programming as recommended by the Plan of the Commission for Higher Education of the State of Indiana (pages 37 and 77).

B. Actions to be Taken by the IHETS Board -

1. Develop and disseminate specific guidelines regarding submission of instructional project proposals and their funding.
2. Authorize the IHETS staff to be of assistance to the universities in searching for additional federal, foundation, and outside sources of funding for instructional materials utilizing IHETS.
3. Authorize the IHETS staff to increase information flow to current and prospective users, and to the faculties and staffs of their constituent institutions regarding existing IHETS policies and procedures.
4. Authorize IHETS and the institutional information officers of their own institutions to accelerate efforts to better inform the educational community, state legislators, and the general public of the educational capability and accomplishments of IHETS.
5. Initiate an annual report, sharing information provided by the universities on attendance in courses and projects using the System.
6. Study various methods of delivery of telecommunications materials including the bicycling and mailing of audio and video tapes and other instructional materials.
7. Name an interinstitutional committee reporting to the Board that will establish specific policies, procedures, and priorities for intercity network line usage based on program priorities.

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8. Sustain the operation of instantaneous talkback at sixteen locations.
9. Undertake studies in the major metropolitan areas of the state in cooperation with the IU School of Medicine Medical Education Resources Program to test the feasibility and desirability of additional 2500 megahertz delivery and distribution systems.
10. Name a task force to study any proposals for a statewide cable and/or broadcast TV networks in light of their effect on IHETS' ability to deliver instructional materials.
11. Authorize origination from IVTC in South Bend and Indianapolis, and from Vincennes University.
12. Authorize extension of service to Indiana University - East at Richmond, Indiana.
13. Authorize the interconnection of three additional ETV stations to the network.
14. Authorize the interconnection of six IVTC locations to the System.
15. Authorize the expansion of SUVON as

C. Actions to be Taken by Each IHETS Member Institution -

1. Request its Dean of Continuing Education or other administrator to explore the potential for cooperative efforts with independent institutions utilizing IHETS as a delivery mode.
2. Recognize its staff members' participation in IHETS' software development as part of that staff member's regular work load.
3. Give a high priority in using the System for statewide credit and continuing and professional education projects especially for those projects having extramural constituencies, i.e. instructional offerings on television broadcasting stations and cable systems utilizing existing test-out procedures or establishing credit via CLEP.
4. Instruct its division or office of sponsored programs to explore federal, foundation, and other funding sources for televised instruction material utilizing or planned for utilizing IHETS.
5. Begin at once to provide the Executive Director of IHETS with specific enrollment information each semester and summer on all campuses utilizing instructional materials over IHETS.

6. Institute a study to be completed the first year of this biennium to determine the location and number of television reception rooms that should be added during the 1975-77 biennium in order to increase the flexibility and versatility of the System.
7. Increase its credit and non-credit radio offerings originated and/or broadcast at its campus and make them available throughout the state utilizing the System to deliver programming to existing AM and FM outlets, both commercial and educational.
8. Initiate at once a study of the costs involved in converting reception and origination sites to color capability and present them as a part of their budget requests to the legislature for funding in order that all sites can be converted to color during the 1975-77 biennium.
9. Increase its dollar commitments for interinstitutional television instructional materials each biennium.

## SECTION C: SECOND BIENNIUM (1975-77)

It is recommended that during the 1975-77 biennium the following steps be taken:

A. Actions to be Taken by the Indiana General Assembly -

1. Re-enact the legislation that originally authorized the state universities to jointly develop the System (this is necessary since that legislation authority expires in 1977) and fund the System in the amount of \$3,691,946.00.

B. Actions to be Taken by the IHETS Board -

1. Authorize the interconnection of seven IVTC locations to the System.
2. Authorize the expansion of SUVON services as indicated.
3. Authorize the installation of sixteen additional tele-processing units and replace a number of units throughout the state.
4. Authorize the installation of nine instantaneous talkback units throughout the state.
5. Authorize the addition of one origination site.

C. Actions to be Taken by Each IHETS Member Institution -

1. Implement the study completed in the previous biennium and allocate and equip additional rooms for television reception based on the study findings.
2. Implement the study completed the previous biennium and convert reception and origination sites to color capability.

SECTION D: THIRD BIENNIUM (1977-79)

It is recommended that in the 1977-79 biennium the following steps be taken:

A. Actions to be Taken by the Indiana General Assembly -

1. Fund the System in the amount of \$3,864,400.00.

B. Actions to be Taken by the IHETS Board -

1. Authorize the addition of one origination site.
2. Authorize installation of seven additional instantaneous talkback units.
3. Authorize the expansion of SUVON as indicated.

SECTION E: FOURTH BIENNIUM (1979-81)

It is recommended that in the 1979-81 biennium the following steps be taken:

A. Actions to be Taken by the Indiana General Assembly -

1. Fund the System in the amount of \$4,137,297.00.

B. Actions to be Taken by the IHETS Board -

1. Authorize the interconnection of two additional reception locations.
2. Authorize the expansion of SUVON as indicated.
3. Authorize the addition of two new teleprocessing units.
4. Authorize the installation of two additional instantaneous talkback units.

SECTION F: FIFTH BIENNIUM (1981-83)

It is recommended that in the 1981-83 biennium the following steps be taken:

A. Actions to be Taken by the Indiana General Assembly -

1. Fund the System in the amount of \$4,422,578.00.

B. Actions to be Taken by the IHETS Board -

1. Authorize the interconnection of one additional reception location.
2. Authorize the expansion of SUVON as indicated.
3. Authorize the addition of one teleprocessing unit.
4. Authorize the installation of one additional instantaneous talkback unit.
5. Authorize the addition of three origination sites.

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ATTACHEMENT A

TEN YEARS BUDGET PROJECTIONS

(It should be kept in mind that  
these Figures are 10 years old  
and serve only as a guide for  
planning.)

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INDIANA HIGHER EDUCATION TELECOMMUNICATION SYSTEM

Ten Year Budget Projection

March 1, 1973

	<u>B<sub>1</sub> 1973-75</u>	<u>B<sub>2</sub> 1975-77</u>	<u>B<sub>3</sub> 1977-79</u>	<u>B<sub>4</sub> 1979-81</u>	<u>B<sub>5</sub> 1981-83</u>
I. MAINTENANCE OF CURRENT OPERATIONS *	\$2,545,340	2,626,790	2,710,847	2,797,594	2,887,117
II. PROGRAM EXPANSION					
A. COOPERATIVE PREPARATION OF INSTRUCTIONAL MATERIALS	200,000	250,000	300,000	300,000	300,000
B. TALKBACK IMPROVEMENT	20,678	62,577	73,702	71,073	76,557
C. INCREASED SYSTEM UTILIZATION AND EFFICIENCY VIA TELEPROCESSING	19,421	147,228	73,224	90,702	86,650
D. SUBON EXPANSION	58,054	81,404	105,922	131,666	158,698
E. INTERCITY LINES EXPANSION	21,330	85,192	149,792	197,592	256,192
F. INCREASE INSTITUTIONAL ORIGINATION SITES	64,350	187,200	223,550	256,800	326,800
G. INTRACITY SYSTEM DISTRIBUTION EXPENSE	23,728	160,246	120,455	133,084	142,481
H. EXPANDED STAFF SERVICES	43,715	91,309	106,908	158,786	188,083
PROGRAM EXPANSION FOR IVTC **	(80,126)	(313,304)	(298,048)	(293,714)	(296,409)
TOTAL PROGRAM EXPANSION	451,276	1,065,156	1,153,553	1,339,703	1,535,461
GRAND TOTAL	2,996,616	3,691,946	3,864,400	4,137,297	4,422,578

\* Inflation has been factored in at 3.2% per year

\*\* Amount already included in Total Program Expansion and Grand Total

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BUDGET PROJECTION DETAIL: CATEGORY II. A. COOPERATIVE PREPARATION OF INTERINSTITUTIONAL MATERIAL

	1972 BASE	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
<b>I. STAFF SERVICES</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (5%)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>II. SUPPLIES &amp; EXPENSES, including line, leasing, and contract chgs</b>											
Balance forwarded	( )	( )	(100,000)	(100,000)	(125,000)	(125,000)	(150,000)	(150,000)	(150,000)	(150,000)	(150,000)
A. Inflation factor (3.2%)	( )	( )	(100,000)	(100,000)	(125,000)	(125,000)	(150,000)	(150,000)	(150,000)	(150,000)	(150,000)
NEW B. Recurring		100,000		25,000		25,000					
C. Nonrecurring											
D. TOTAL		100,000	100,000	125,000	125,000	150,000	150,000	150,000	150,000	150,000	150,000
<b>III. CAPITAL EQUIPMENT</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (4%)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>IV. CONSTRUCTION</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>V. TRAVEL</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>TOTAL NEW MONEY</b>		100,000		25,000		25,000					
<b>GRAND TOTAL</b>		100,000	100,000	125,000	125,000	150,000	150,000	150,000	150,000	150,000	150,000
<b>BIENNIAL TOTALS</b>		200,000		250,000		300,000		300,000		300,000	

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BUDGET PROJECTION DETAIL: CATEGORY 11.B. TALKBACK

	1972 BASE	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
<b>I. STAFF SERVICES</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (5%)	---	---	---	---	---	---	---	---	---	---	---
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>II. SUPPLIES &amp; EXPENSES, including line, leasing, and contract chgs</b>											
Balance forwarded	( )	( 6000 )	( 9192 )	( 9486 )	( 15,790 )	( 16,295 )	( 20,316 )	( 20,966 )	( 21,637 )	( 23,329 )	( 24,076 )
A. Inflation factor (3.2%)	---	192	294	304	505	521	650	671	692	747	720
NEW B. Recurring	6000	3000		6000 <sup>(*)</sup>		3,500 <sup>(*)</sup>			1,000 <sup>(*)</sup>		500 <sup>(*)</sup>
C. Nonrecurring											
D. TOTAL	6000	9192	9486	15,790	16,295	20,316	20,966	21,637	23,329	24,076	25,346
<b>III. CAPITAL EQUIPMENT</b>											
Balance forwarded	( )	( )	( )	( )	( 4,800 )	( 7,692 )	( 8,000 )	( 10,420 )	( 10,837 )	( 11,270 )	( 12,321 )
A. Inflation factor (4%)	---	---	---	---	192	308	320	417	433	451	493
NEW B. Recurring				4,800 <sup>(*)</sup>	2,700 <sup>(*)</sup>		2,100 <sup>(*)</sup>			600 <sup>(*)</sup>	
C. Nonrecurring	30,000	2000		18,000 <sup>(*)</sup>		14,000 <sup>(*)</sup>			4,000 <sup>(*)</sup>		2,000 <sup>(*)</sup>
D. TOTAL	30,000	2000		22,800	7,692	22,000	10,420	10,837	15,270	12,321	14,814
<b>IV. CONSTRUCTION</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor	---	---	---	---	---	---	---	---	---	---	---
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>V. TRAVEL</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor	---	---	---	---	---	---	---	---	---	---	---
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
TOTAL NEW MONEY	36,000	5000		28,800	2,700	17,500	2,100		5,000	600	2,500
GRAND TOTAL	36,000	11,192	9,486	38,590	23,987	42,316	31,386	32,474	38,599	36,397	40,160
BIENNIUM TOTALS		20,678		62,577		73,702		71,073		76,557	

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BUDGET PROJECTION DETAIL: CATEGORY 11. C. TELEPROCESSING

		1972	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
		BASE										
I. STAFF SERVICES	Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW	A. Inflation factor (5%)											
	B. Recurring											
	C. Nonrecurring											
	D. TOTAL											
II. SUPPLIES & EXPENSES, including line, leasing, and contract chgs	Balance forwarded	( )	( 6,400 )	( 6,605 )	( 6,816 )	( 10,634 )	( 13,774 )	( 14,215 )	( 14,670 )	( 15,139 )	( 16,423 )	( 16,949 )
NEW	A. Inflation factor (3.2%)		205	211	218	340	441	455	469	484	526	542
	B. Recurring	6,400			3,600	2,800						
	C. Nonrecurring	500								800		
	D. TOTAL	6,900	6,605	6,816	10,634	13,774	14,215	14,670	15,139	16,423	16,949	17,491
III. CAPITAL EQUIPMENT	Balance forwarded	( )	( )	( )	( )	( 8,000 )	( 12,820 )	( 16,833 )	( 17,506 )	( 18,206 )	( 18,934 )	( 20,691 )
NEW	A. Inflation factor (4%)					320	537	673	700	728	757	828
	B. Recurring				8,000	4,500	3,500				1,000	
	C. Nonrecurring	95,000			54,000	42,000						
	D. TOTAL	95,000			62,000	54,820	16,833	17,506	18,206	30,934	20,691	21,519
IV. CONSTRUCTION	Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW	A. Inflation factor											
	B. Recurring											
	C. Nonrecurring											
	D. TOTAL											
V. TRAVEL	Balance forwarded	( )	( )	( 3,000 )	( 3,000 )	( 3,000 )	( 3,000 )	( 5,000 )	( 5,000 )	( 5,000 )	( 5,000 )	( 5,000 )
NEW	A. Inflation factor											
	B. Recurring		3,000				2,000					
	C. Nonrecurring	1,000										
	D. TOTAL	1,000	3,000	3,000	3,000	3,000	5,000	5,000	5,000	5,000	5,000	5,000
TOTAL NEW MONEY		102,900	3,000		65,600	49,300	5,500			12,800	1,000	
GRAND TOTAL		102,900	9,605	9,816	75,634	71,594	76,048	37,176	38,345	52,357	42,640	44,010
BIENNIUM TOTALS			19,421		147,228		73,224		90,702		86,650	

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BUDGET PROJECTION DETAIL: CATEGORY 11. D. SUVON

	1972 BASE	B1 1973-74 1974-75		B2 1975-76 1976-77		B3 1977-78 1978-79		B4 1979-80 1980-81		B5 1981-82 1982-83	
<b>I. STAFF SERVICES</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (5%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>II. SUPPLIES &amp; EXPENSES, including line, leasing, and contract chgs</b>	408,962 <sup>(1)</sup>			467,016 <sup>(2)</sup>		490,366 <sup>(3)</sup>		514,884 <sup>(4)</sup>		540,628 <sup>(5)</sup>	
Balance forwarded	( )	( )	(23,495)	( )	(58,054)	( )	(81,404)	( )	(105,922)	( )	(131,666)
A. Inflation factor (3.2%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NEW B. Recurring		23,495 <sup>(2)</sup>	11,064 <sup>(2)</sup>		23,350 <sup>(3)</sup>		24,518 <sup>(4)</sup>		25,744 <sup>(4)</sup>		27,032 <sup>(4)</sup>
C. Nonrecurring											
D. TOTAL											
<b>III. CAPITAL EQUIPMENT</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (4%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>IV. CONSTRUCTION</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>V. TRAVEL</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>TOTAL NEW MONEY</b>		23,495	11,064		81,404		105,922		131,666		158,698
<b>GRAND TOTAL</b>		23,495	34,559								
<b>BIENNIUM TOTALS</b>		58,054		81,404		105,922		131,666		158,698	

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BUDGET PROJECTION DETAIL: CATEGORY 11. E. INTERCITY LINE EXPANSION

	1972 BASE	B1 1973-74 1974-75		B2 1975-76 1976-77		B3 1977-78 1978-79		B4 1979-80 1980-81		B5 1981-82 1982-83	
<b>I. STAFF SERVICES</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW A. Inflation factor (5%)											
B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>II. SUPPLIES &amp; EXPENSES, including line, leasing, and contract chgs</b>						25,596		66,396		86,796	
Balance forwarded	(773,128)	( )	( )	(25,596)	(25,596)	40,800	(66,396)	20,400	(86,796)	28,800	(115,596)
NEW A. Inflation factor (3.2%)						(66,396)	(66,396)	(86,796)	(86,796)	115,596	(115,596)
B. Recurring			21,330		34,000(2)		17,000(3)		24,000(4)		25,000(5)
C. Nonrecurring											
D. TOTAL	773,128		21,330	25,596	59,596	66,396	83,396	86,796	110,796	115,596	140,596
<b>III. CAPITAL EQUIPMENT</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW A. Inflation factor (4%)											
B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>IV. CONSTRUCTION</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW A. Inflation factor											
B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>V. TRAVEL</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
NEW A. Inflation factor											
B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>TOTAL NEW MONEY</b>			21,330		34,000		17,000		24,000		25,000
<b>GRAND TOTAL</b>	773,128		21,330	25,596	59,596	66,396	83,396	86,796	110,796	115,596	140,596
<b>BIENNIAL TOTALS</b>			21,330		85,192		149,792		197,592		256,192

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BUDGET PROJECTION DETAIL: CATEGORY II. F. ORIENTATION

	1972 BASE	B1		B2		B3		B4		B5	
		1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
I. STAFF SERVICES											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (5%)											
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
II. SUPPLIES & EXPENSES, including line, leasing, and contract chgs											
Balance forwarded	( )	( )	(10,200)	(10,200 <sup>(1)</sup> )	(89,100)	(10,800 <sup>(2)</sup> )	(89,100)	(99,900)	(28,500 <sup>(3)</sup> )	(128,400)	(128,400)
A. Inflation factor (3.2%)				(50,100 <sup>(2)</sup> )					(99,900)		
NEW B. Recurring		5,100 <sup>(1)</sup>	25,050 <sup>(2)</sup>	28,800 <sup>(3)</sup>	9,000 <sup>(4)</sup>		23,750 <sup>(5)</sup>				70,000 <sup>(6)</sup>
C. Nonrecurring			24,000 <sup>(5)</sup>								
D. TOTAL		5,100	59,250	89,100	98,100	99,900	123,650	128,400	128,400	128,400	198,400
III. CAPITAL EQUIPMENT											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (4%)											
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
IV. CONSTRUCTION											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor											
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
V. TRAVEL											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor											
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
TOTAL NEW MONEY		5,100	49,050		9,000		23,750				70,000
GRAND TOTAL		5,100	59,250	89,100	98,100	99,900	123,650	128,400	128,400	128,400	198,400
BIENNIAL TOTALS		64,350		187,200		223,550		256,800		326,800	

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BUDGET PROJECTION DETAIL: CATEGORY II. G. INTRACITY DISTRIBUTION

		1972 BASE	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
<b>I. STAFF SERVICES</b>												
	Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
	A. Inflation factor (5%)											
NEW	B. Recurring											
	C. Nonrecurring											
	D. TOTAL											
<b>II. SUPPLIES &amp; EXPENSES, including line, leasing, and contract chgs</b>												
	Balance forwarded	( 7,500 <sup>(5)</sup> )	( 7,500)	( 7,740)	(13,988)	(20,436)	( 21,090)	(27,765)	( 32,653)	(33,698)	(34,776)	(35,889)
	A. Inflation factor (3.2%)		240	248	448	654	675	888	1,045	1,078	1,113	1,148
NEW	B. Recurring			6,000 <sup>(1)</sup>	6,000 <sup>(2)</sup>		6,000 <sup>(3)</sup>	4,000 <sup>(4)</sup>				
	C. Nonrecurring											
	D. TOTAL	7,500	7,740	13,988	20,436	21,090	27,765	32,653	33,698	34,776	35,889	37,037
<b>III. CAPITAL EQUIPMENT</b>												
	Balance forwarded	( )	( )	( )	( )	(18,000)	( 18,720)	(27,469)	( 28,568)	(29,711)	( 30,899)	(32,135)
	A. Inflation factor (4%)					720	749	1,099	1,143	1,188	1,236	1,285
NEW	B. Recurring				18,000 <sup>(5)</sup>		8,000 <sup>(3)</sup>					
	C. Nonrecurring	108,100 <sup>(4)</sup>				80,000 <sup>(4)</sup>						
	D. TOTAL	108,100			18,000	98,720	27,469	28,568	29,711	30,899	32,135	33,420
<b>IV. CONSTRUCTION</b>												
	Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
	A. Inflation factor											
NEW	B. Recurring											
	C. Nonrecurring											
	D. TOTAL											
<b>V. TRAVEL</b>												
	Balance forwarded	( )	( )	( 1,000)	( 1,000)	( 1,000)	( 1,000)	( 2,000)	( 2,000)	( 2,000)	( 2,000)	( 2,000)
	A. Inflation factor											
NEW	B. Recurring		1,000				1,000					
	C. Nonrecurring											
	D. TOTAL		1,000	1,000	1,000	1,000	2,000	2,000	2,000	2,000	2,000	2,000
<b>TOTAL NEW MONEY</b>		108,100	1,000	6,000	24,000	80,000	15,000	4,000				
<b>GRAND TOTAL</b>		115,600	8,740	14,988	39,436	120,810	57,234	63,221	65,409	67,675	70,024	72,457
<b>BIENNIAL TOTALS</b>			23,728		160,246		120,455		133,084		142,481	

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BUDGET PROJECTION DETAIL: CATEGORY

11. W. EXPANDED STAFF SERVICES

(moving & rental increases, etc.)

	1972 BASE	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
<b>I. STAFF SERVICES</b>											
Balance forwarded	( )	( )	(12,500)	(27,125)	(35,481)	(37,255)	(49,118)	(51,574)	(68,153)	(84,561)	(88,789)
A. Inflation factor (5%)			625	1,356	1,774	1,863	2,456	2,579	3,408	4,228	4,439
NEW B. Recurring		12,500	14,000	7,000	10,000			14,000	13,000		
C. Nonrecurring	8,000										
D. TOTAL	8,000	12,500	27,125	35,481	37,255	49,118	51,574	68,153	84,561	88,789	93,228
<b>II. SUPPLIES &amp; EXPENSES, including line, leasing, and contract chgs</b>											
Balance forwarded	( )	( )	( )	(2,000)	(2,064)	(2,130)	(2,198)	(2,268)	(2,341)	(2,416)	(2,493)
A. Inflation factor (3.2%)				64	66	68	70	73	75	77	80
NEW B. Recurring			2,000								
C. Nonrecurring			1,500		10,000						
D. TOTAL			3,500	2,064	12,130	2,198	2,268	2,341	2,416	2,493	2,573
<b>III. CAPITAL EQUIPMENT</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor (4%)											
NEW B. Recurring											
C. Nonrecurring			340	3,879		1,250		315			
D. TOTAL			340	3,879		1,250		315			
<b>IV. CONSTRUCTION</b>											
Balance forwarded	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
A. Inflation factor											
NEW B. Recurring											
C. Nonrecurring											
D. TOTAL											
<b>V. TRAVEL</b>											
Balance forwarded	( )	( )	( )	(250)	(250)	(250)	(250)	(250)	(500)	(500)	(500)
A. Inflation factor											
NEW B. Recurring			250					250			
C. Nonrecurring											
D. TOTAL			250	250	250	250	250	500	500	500	500
<b>TOTAL NEW MONEY</b>	8,000	12,500	18,090	10,879	10,000	11,250		14,565	13,000		
<b>GRAND TOTAL</b>	8,000	12,500	31,215	41,674	49,635	52,816	54,092	71,309	87,477	91,782	96,301
<b>BIENNIUM TOTALS</b>		43,715		91,309		106,908		158,786		188,083	

Key to Footnotes

## Category

II. B. Talkback:

- (1) 3 lines @ \$1,000/year plus 6 lines @ \$500/year
- (2) Lines @ \$500 each/year
- (3) Basic campus TB 10 unit @ \$2,000 each
- (4) Depreciation @ \$300/year

II. C. Teleprocessing:

- (1) Head and tape wear @ \$400/unit/year
- (2) VTR depreciation @ \$500/unit/year beginning second year
- (3) Capital for new units @ \$6,000 each

II. D. SUVON:

- (1) Base 1971-72 SUVON budget
- (2) SUVON increase 73/75 budget
- (3) Base utilized in computing % increase
- (4) Increase based on 5% of current base beginning July 1975

II. E. Intercity Line Expansion:

- |                                    |                      |
|------------------------------------|----------------------|
| (1) Richmond                       | 9-74 @ \$2,133/month |
| (2) F3S                            | 9-76 @ \$3,400/month |
| (3) FlX                            | 9-78 @ \$1,700/month |
| (4) Two additional cities (A & Ma) | 9-80 @ \$2,400/month |
| (5) Unknown                        | 9-82 @ \$2,500/month |

II. F. Origination:

- |                                          |                 |      |
|------------------------------------------|-----------------|------|
| (1) Mallory                              | @ \$850/month   | 1-74 |
| (2) South Bend                           | @ \$4,175/month | 1-75 |
| (3) Vincennes-Jasper                     | @ \$2,400/month | 9-74 |
| (4) WFYI                                 | @ \$900/month   | 9-76 |
| (5) Vincennes-Terre Haute<br>Switch      | @ \$2,375/month | 9-78 |
| (6) Three additional cities<br>(E, F, H) | @ \$7,000/month | 9-82 |

II. G. Intracity Distribution:

- (1) IHETS' share of new ITFS operation @ \$3,000/year
- (2) S & E @ \$2,000/year
- (3) Depreciation @ 10%/year
- (4) New ITFS connects - G, E, N & other B, L, M, R
- (5) Current ITFS operation
- (6) ITFS connects I/C, T, F & other connects K, S

Key to Footnotes (continued)

## Category

II. H. Expanded Staff Services:

- (1) 1.0 FTE Field Engineer
  - .5 FTE Teleprocessing (II. C.)
  - .3 FTE Intracity Distribution (II. G.)
  - .2 FTE Talkback (II. B.)
- (2) 1.0 FTE Projects Administrator
- (3) 1.0 FTE Projects Administrator Secretary
- (4) 1.0 FTE Field Technician
  - .4 FTE Teleprocessing (II. C.)
  - .4 FTE Talkback (II. B.)
  - .2 FTE Intracity Distribution (II. G.)
- (5) 1.0 FTE Media Utilization Specialist
- (6) 1.0 FTE Business Manager
- (7) Rent increase - recurring addition to present rent of \$8,000
- (8) Cost of first move - 7/74
- (9) Cost of second move - 7/77