BASIC DESIGN STUDY ON THE CONSTRUCTION PROJECT OF EDUCATIONAL BROADCASTING PRODUCTION CENTRE IN THE KINGDOM OF THAILAND

JUNE, 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

No. 13863

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P R E F A C E

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan decided to conduct a Basic Design Study for the Construction Project of Educational Broadcasting Production Centre and entrusted the survey to the Japan International Cooperation Agency (J.I.C.A.). The J.I.C.A. sent to Thailand a survey team headed by Mr. Minoru ISHIDA, Second Economic Cooperation Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, from January 24 to February 13, 1982.

The team had discussions with the officials concerned of the Government of Thailand and conducted a field survey in Bangkok area. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

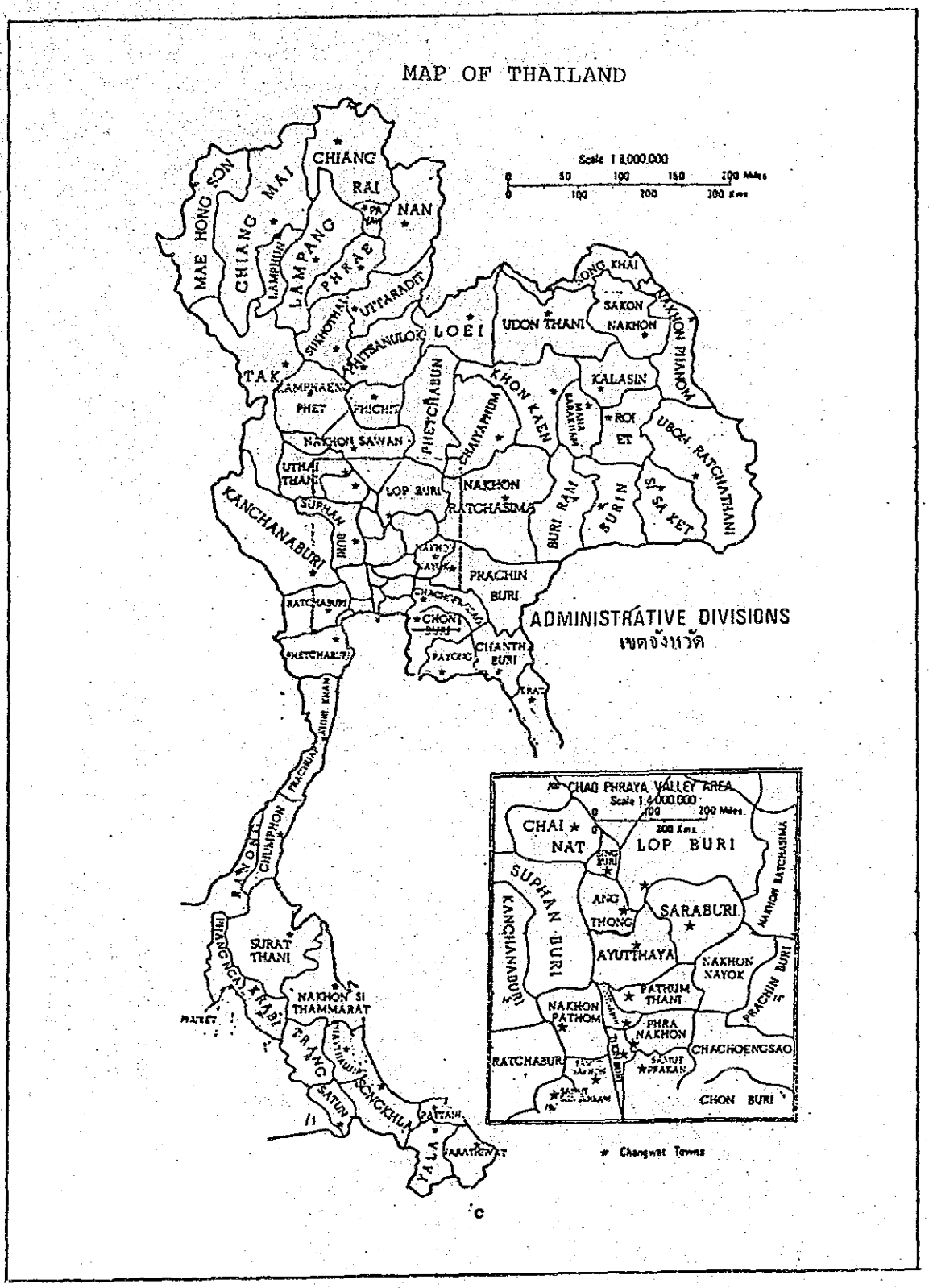
I wish to express my deep appreciation to the officials concerned of the Government of the Kingdom of Thailand for their close cooperation extended to the team.

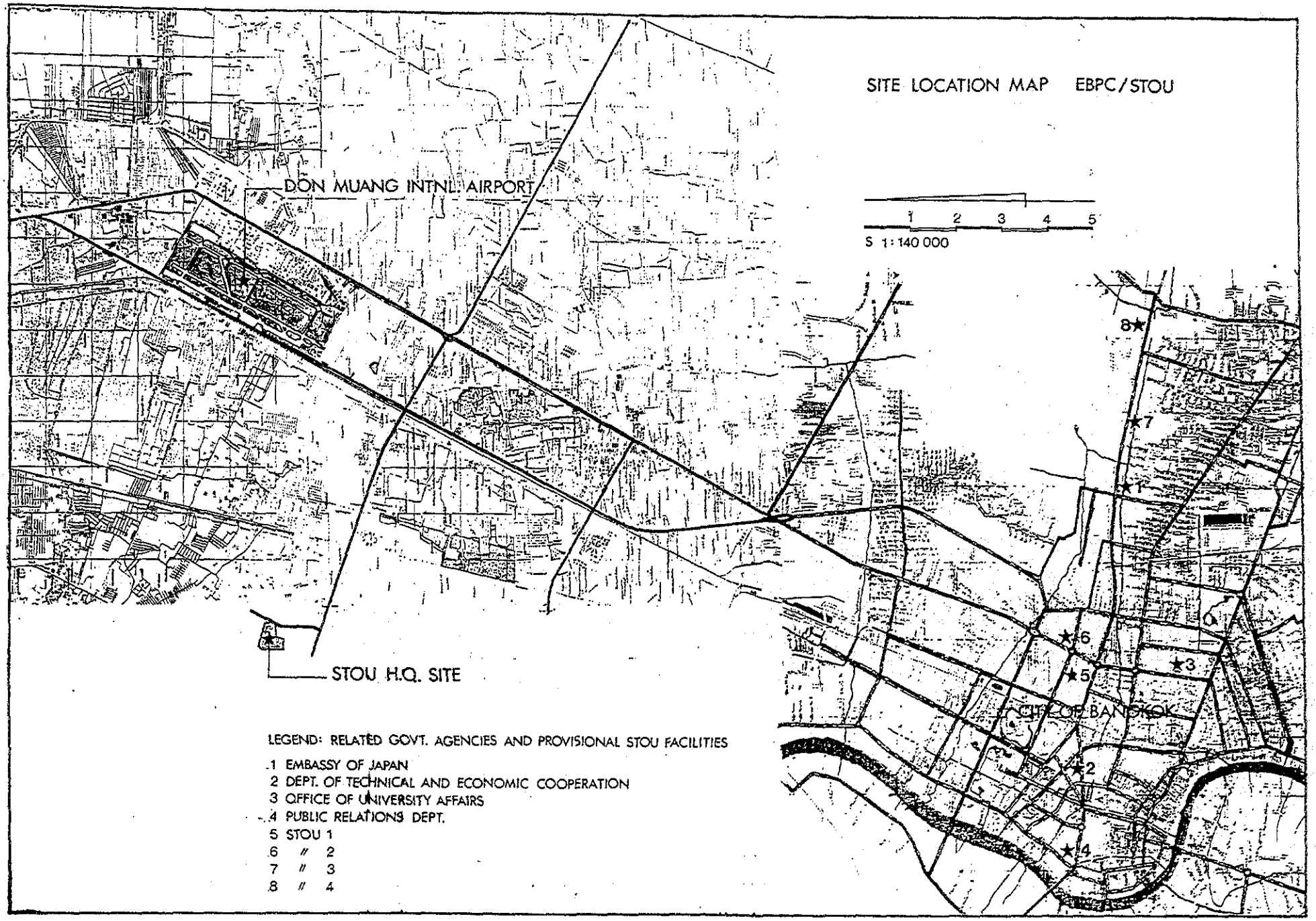
June, 1982

Keisuke Arita

Keisuke Arita
President
Japan International
Cooperation Agency

MAP OF THAILAND

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1 EMBASSY OF JAPAN
2 DEPT. OF TECHNICAL AND ECONOMIC COOPERATION
3 OFFICE OF UNIVERSITY AFFAIRS
4 PUBLIC RELATIONS DEPT.
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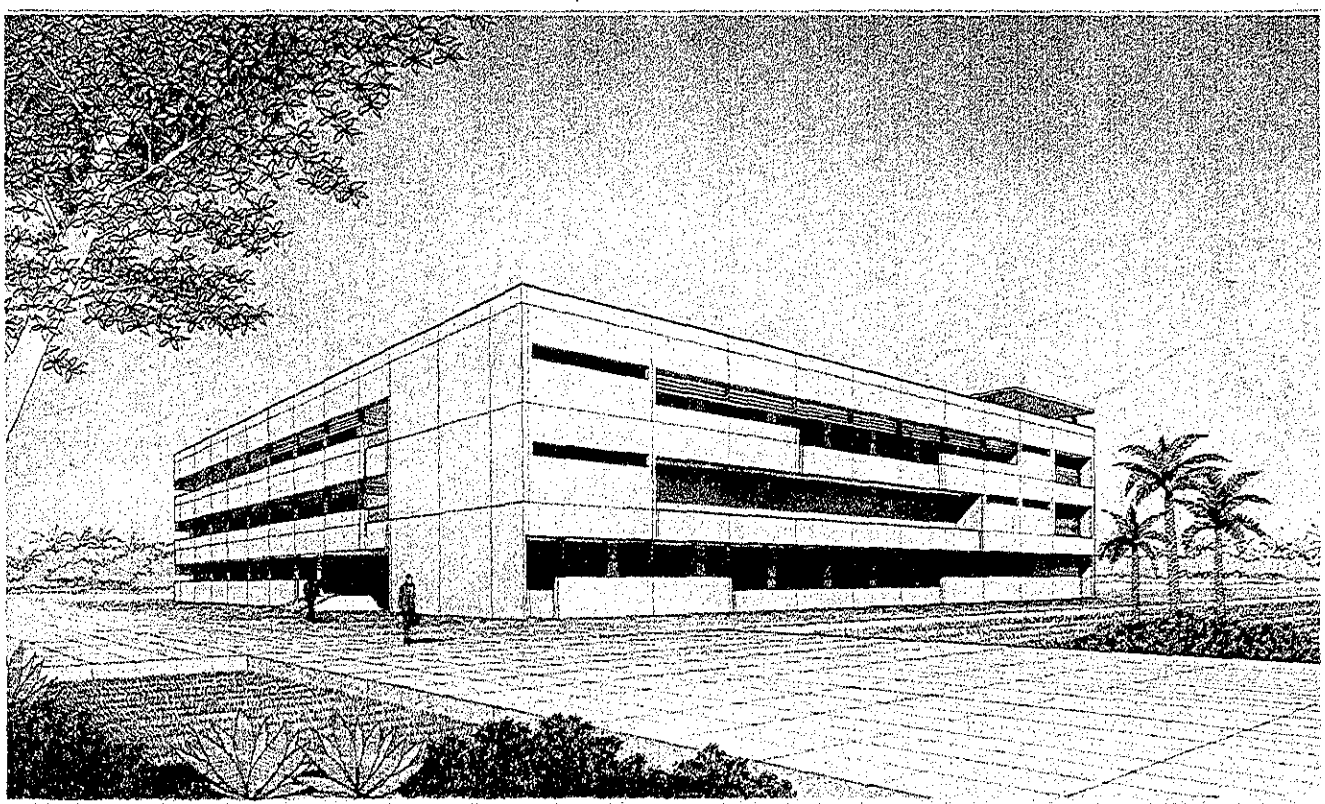

EDUCATIONAL BROADCASTING PROGAM PRODUCTION CENTER
Sukhothai Thammathirat Open University
The Kingdom of Thailand

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SUMMARY

SUMMARY

The new type open university was created by Royal Charter in September 1978 under the name of "Sukhothai Thammathirat Open University" (S.T.O.U.). S.T.O.U. holds to the principle of lifelong education, and aims at improving the quality of life of the general public in response to the ever increasing demand for higher education.

S.T.O.U. does not have its own class rooms relying instead on its regional and local study centers to provide study facilities for students in various parts of the country.

To help student's study on their own, S.T.O.U. employs distance-teaching techniques and uses correspondence texts, textbooks and workbooks as its main media.

Radio and Television Broadcasts as well as course materials recorded on cassette tapes are also used as a support media.

Tutorial and counselling sessions at various regional and local study centers are held once per month during the semester to promote student's effort of home-study.

S.T.O.U. adopts a two-semester system and offers study programmes for degree purposes, in parallel with for non-degree purposes, and allows its students to take a degree in 4 -- 12 years.

The administrative organization of S.T.O.U. consists of six offices, that is, "Office of the Rector", "Office of Educational Technology", "Office of Academic Affairs" and "Office of

Registration, Records and Evaluation". Since the establishment of S.T.O.U., the locations of those temporary office buildings have been scattered in four separate sites in Bangkok.

A new headquarters office building complex has been planned since the foundation of S.T.O.U. and a new site for this building complex has already secured at Nontaburi in the northern suburb of Bangkok and the land is now under levelling.

The construction of headquarters building is planned to start on around the middle of May 1982.

Though "Educational Broadcasting Production Centre" (E.B.P.C.) form a part of the building complex, the Government of Thailand has made a request for technical and financial assistance by the Government of Japan based on the reason that many sorts of advanced technology and a large amount of funds will be necessary for E.B.P.C. building because this centre will have to play a major role for the substantial activities of S.T.O.U. and special considerations for the building design will be necessary to realize the most functional programme production operation in this centre building.

The above request was proposed by the Government of Thailand as a top priority at the time of 1981 annual meeting on the bilateral technical cooperation between the Government of Thailand and the Government of Japan.

"Educational Broadcasting Programme Production Centre" is a very important facility for producing their own radio and TV programmes to be solely used as a part of S.T.O.U.'s educational materials.

According to the five year plan of S.T.O.U., 245 study courses in 1984 (362 study courses in 1986) is to be opened and, accordingly, 3,675 (and 5,430) radio programmes and 1,225 (and 1,810) TV programmes will be needed for the above mentioned number of study courses.

To produce such a large number of radio and TV programmes at E.B.P.C. before the end of 1986, 6 rooms of radio studio and 3 rooms of TV studio and accompanying service rooms including a central apparatus room, office rooms for production staff will be needed and accordingly total floor area of 4,375 square meters will be required to accommodate the above mentioned studios and service rooms within this centre building.

The exact location of the new site is 13°54' North and 110°32' East (about 20 km from the centre of Bangkok) and altitude of the site is about 10 metres above sea level.

The site area is about 36 acres (145,680 m^2) and a 13.5 meter wide paved road with a sewer pipe and a power distribution trunk line is running along east side of the site.

To protect the presumed flood which is frequently caused by heavy rainfall and constant high level of subterranean

water (this phenomenon is shown quite common in Bangkok area), the site is surrounded by bank and a creek for water reservoir is provided inside the bank surrounding.

From evaluation of the results of subsoil investigation carried out for the S.T.O.U. site, it is planned to support the building with reinforced concrete piles to avoid subsidence of the whole building. The pilehead shall be embedded in a sand layer which is located 22 meters beneath the ground surface.

The preparatory works for the site area of 48,560 m^2 out of the total area, where is already completed levelling work as a first phase construction, such as construction of electric power distribution network, drainage pipework, water-supply pipework, well-sinking work, pumphouse building work, water-tank work and pavement work are now under way and as of February of 1982 those works were about to complete. The whole such a preparatory works will be finished before the end of 1982.

The Government of Thailand has allotted to S.T.O.U. 43,910,000 Bahts as the funds for preparatory works and 84,056,000 Bahts as the funds for building a headquarters office building complex except E.B.P.C. building.

From the results of study on the operation cost of E.B.P.C. it can be concluded that the amount nearly equal to 1% of the total annual operational cost of S.T.O.U. will be enough for supporting annual cost for electricity,

maintenance cost for equipment and building and other miscellaneous expenses for E.B.P.C. and accordingly no serious problems on the operation and maintenance of E.B. P.C. will be foreseen.

However, it is recommended to S.T.O.U. that depreciation reserve fund system should be introduced in order to assure finances for renewal of building and facilities in the future because depreciation reserve fund is not included in the above mentioned 1%.

This project is to set up a centre for the production of radio and TV programmes which is the most important part of S.T.O.U.'s distance teaching activities. This project will also contribute to the life-long education of general public living in the Thailand as radio and TV programmes produced in this centre will be utilized directly by the general public through existing radio and TV broadcasting network.

SECTION 1

INTRODUCTION

SECTION 1 INTRODUCTION

1-1 Background of Request for Technical and Economic Cooperation

1-1-1 To provide equality of opportunity for university education to people in all walks of life as an extension of the Thai Government's policy of the democratization of education, open admission university such as Thammasat University and Ramkamhaeng University were established in the past. However, students of these universities had to attend school due to the reliance on classroom instruction system.

Accordingly, it became more and more difficult to prepare enough classrooms and other facilities for accommodating a large number of students in response to the increasing number of newly enrolled students owing to the free admission system.

After all, both universities had stopped the free admission system after 20 years of operation in the case of Thammasat University and 7 years of operation in the case of Ramkamhaeng University and switched to the closed admission system by adopting an entrance examination system to keep a limited number of enrollment acceptable to the university's educational capacity.

On the Other hand, the total number of population in the Kingdom of Thailand reached 45.5 million according

to the statistical census in 1979, of whom 80% lived in rural areas and 47% were over 20 years of age.

Therefore, provision of more opportunities for university education to the working people who live in a local city or a town had been keenly sought until another open university adopting such unique distance teaching system as S.T.O.U. was established.

The establishment plan of this new open university "S.T.O.U." has been prepared by "The Office of University Affairs" and especially Dr. Wichit Srisa-an, Deputy Under-Secretary of State, has been working very hard as a center of promotion for the realization of this project.

After 3 years of preparation, Sukhothai Thammathirat Open University (S.T.O.U.) was born in September, 1978 in Bangkok.

1-1-2 Educational system adopted by S.T.O.U.

Not like other universities, S.T.O.U. adopts the principle of home study system as its basic educational means with the aid of distance teaching technique.

S.T.O.U. adopts a two-semester system and allows its students to take a degree in 4-12 years. Courses are arranged in blocks to provide an integrated study of interrelated susbjects.

New semesters start in July and January in every year and each semester is usually composed of 15 one week home study units plus a semester-end examination.

Accordingly, textbooks and workbooks are designed to be composed of 15 units so that each student will be able to make self-study one unit per week.

As supplementary information and instruction, one audio cassette tape is attached to each textbook and 15 of 20 minutes radio broadcast programmes and 5 of 30 minutes TV programmes have been prepared and aired along with the progress of home study for each study course of the semester.

1-1-3 Preparation of radio and TV programme for each study course of S.T.O.U.

A series of programme production activities at S.T.O.U. starting from programme planning, script writing and programme production itself to the completion of programme package, are carried out by the hand of E.B.P.C. staff as a part of substantial educational activity in S.T.O.U. so as to enable those programmes to be used as the important part of educational materials together with textbooks and workbooks for distance teaching technique.

1-1-4 The construction plan of headquarters office building complex

The administrative organisation of S.T.O.U. consists of six offices, that is, "Office of the Rector", "Office of Educational Service", "Office of Schools", "Office of Educational Technology", "Office of Academic Affairs" and "Office of Registration, Records and Evaluation".

Since the establishment of S.T.O.U., the locations of those temporary office buildings have been scattered in four separate sites in Bangkok and this has forced inconvenient and inefficient operation on the headquarters' administrative work in S.T.O.U.

The necessary funds for the setup of a new headquarters office building complex were requested to the Government of Thailand in 1979 and the request was accepted and approved by the Government.

In 1980/81 fiscal year, the Government allotted 84 million Bahts to this project for the preparatory work of construction such as land acquisition, preparation of master plan and so on.

Then, the Government of Thailand has made a request for technical and financial assistance by the Government of Japan based on the reason that many sorts of advanced technology and a large amount of funds will be necessary for building such a new Educational Broadcasting Programme Production Centre with satisfactory functions.

In response to the request, the Government of Japan has decided to send a study team and conduct a basic design study in respect of the said project.

Based on this decision, the Japan International Cooperation Agency (JICA) carried out the study in close collaboration with S.T.O.U. and other authorities concerned of the Government of Thailand.

1-2 Objective of the survey

The survey team made a survey of the following;

a) Confirmation of the contents of the request made by the Government of Thailand to the Government of Japan regarding the assistance for the Educational Broadcasting Programme Production Centre Project of S.T.O.U. through discussion with persons officially concerned.

b) Survey of the status-quo of S.T.O.U. in terms of organisation, staff, facilities, activities, management and

achievement along with its future development.

c) Survey of the proposed project site.
Collection of data and information regarding the local market situation as to the availability and cost of materials and labour force including ability of local contractors.

Based on the result of the above survey the following points were studied.

d) Estimation of character and quantity of educational programmes to be needed in the future.

e) Working out of optimum scale and function of the production centre to be established.

f) Estimation of the project cost and duration.
Establishment of implementation schedule.

g) Estimation of cost and personnel formation necessary for operation of the production centre.

SECTION 2

BACKGROUND OF THE PROJECT

SECTION 2 BACKGROUND OF THE PROJECT

As the results of survey carried out by mission team in accordance with the items mentioned in SECTION 1 under the close collaboration with the staff of S.T.O.U., the following background of the project was made clear.

Sukhothai Thammathirat Open University (S.T.O.U.), established by Royal Charter on September 21, 1978, is an institution of higher education which holds to the principle of lifelong education, and aims at improving the quality of life of the general public in response to the ever increasing demand for higher education.

The main objective of S.T.O.U. is to provide equality of opportunity for university education to people in all walks of life as an extension of the Thai Government's policy of the democratization of education, making the best possible use of the existing infrastructure in the country to develop human resource.

Through distance teaching techniques and such teaching media as prints, radio and TV programmes, working people in various professions throughout the country, especially those in remote areas, will be given an equal and low cost opportunity to have access to both higher education and professional training without having to stop working while studying. In this way, S.T.O.U. can upgrade the educational

standards and the professional competence of such working adults as are comparatively less privileged than others. It is expected that this will help increase national productivity, improve the quality of life and thereby promote social equity in Thailand.

S.T.O.U. will provide new high school graduate who have not obtained entrance to a conventional university with a chance for higher education in those fields where there is a great demand for manpower in response to the Human Resource Development Plan of the Thai Government.

S.T.O.U. adopts the principle of home study system as its basic educational means with aid of distance teaching technique, and allows its students who have high school certificates to take a degree in 4 to 12 years.

S.T.O.U.'s home-based students will be supplied with printed self-instructional course materials supplemented by educational radio and television programmes. In addition, they can have access to regular tutorial sessions at regional and local study centers set up throughout the country. In the inaugural year (December 1980) S.T.O.U. admitted a total of 82,139 students including 68 Buddhist monks. The sectional breakdown in terms of school and programmes is as follows:

SCHOOL OF EDUCATIONAL STUDIES	
Certificate of Education	1,729
Elementary Education	29,594

Secondary Education	24,896
Educational Administration	19,115
SCHOOL OF MANAGEMENT SCIENCE	
Construction Management	6,805

In July 1982, the projected numbers of new students in various schools are as follows:

SCHOOL OF EDUCATIONAL STUDIES	
Certificate of Education	1,000
Elementary Education	40,000
Secondary Education	4,000
SCHOOL OF MANAGEMENT SCIENCE	
Construction Management	1,200
Business Administration (2 years)	5,000
Business Administration (4 years)	20,000
SCHOOL OF HEALTH SCIENCE	
Health Management (4 years)	1,000
SCHOOL OF LAW	
(3 years)	10,000
(4 years)	30,000
SCHOOL OF ECONOMICS	
(4 years)	10,000

SCHOOL OF HOME ECONOMICS		
Community Nutrition	(2 years)	10,000
SCHOOL OF AGRICULTURAL EXTENSION AND COOPERATIVES		
	(2 years)	5,000
	(4 years)	10,000
Total:		147,200

By 1986, approximately 500,000 students are expected to enrol in ten schools: (1) Educational Studies (2) Management Science (3) Liberal Arts (4) Health Science (5) Law (6) Economics (7) Home Economics (8) Political Science (9) Agricultural Extension and Cooperatives and (10) Communication Arts.

Since S.T.O.U. employs distance teaching methods, it is necessary to utilize fully integrated multi-media comprising printed self-instructional materials, educational radio and television programmes and tutorial sessions. As educational broadcasting is an integral part of S.T.O.U. media component, a production center with high professional quality is needed to produce educational radio and television programmes for S.T.O.U. students and for the general public.

During 1981-1986, S.T.O.U. will offer approximately 362 courses each course being equivalent to six semester credits. More than 5,430 radio programmes and 1,810 television

programmes, will be produced. Thus, adequate production equipment is needed for the production complex to be constructed at S.T.O.U. headquarters at Nontaburi.

Based on the background of project as mentioned above, the request was proposed by the Government of Thailand as a top priority at the time of 1981 annual meeting on the bilateral technical cooperation between the Government of Thailand and the Government of Japan.

SECTION 3

OUTLINE OF THE PROJECT PROPOSED BY S.T.O.U.

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3-1 Duration of the Project

From 1981-1983

3-2 Project Site

The land for Headquarters Office Building Complex has already been acquired prior to the arrival of Japanese survey mission team. The total site area acquired by S.T.O.U. for the purpose of building Headquarters Office Building Complex is about 36 acres including donated land area of 12 acres and the site location is on Jangwatana Road, Pakred Nontaburi, about 20 Kilometers north from Central Bangkok. The Educational Broadcasting Production Centre will be housed at S.T.O.U. Headquarters.

3-3 Project Work Plan and Activities

In establishing the Educational Broadcasting Production Centre, the workplan and activities will be organized into 2 phases:

Phase I: Planning and Preparation Stage (1981-1982)

At this stage, the masterplan for establishing the Educational Broadcasting Production Centre will be prepared, and financial assistance will be requested from international or foreign agencies. After approval of the

masterplan and identification of the sources of revenue, the masterplan will be implemented.

Phase II: Operation Stage (1982-1983)

At this stage, the construction of the Educational Broadcasting Production Centre Building will be completed, the production equipment purchased and installed, and related personnel recruited. Then, the Centre will be ready to produce radio programmes, television programmes and films by the end of 1983.

3-4 Requested Assistance

Assistance requested includes building, equipment, experts and training for the Educational Broadcasting Production Centre Project.

3-4-1 Building

A building for the Educational Broadcasting Production Centre is needed with an approximate area of 4,855 square meters.

1.	Radio Production Unit	715 square meters
	-Working Area	415
	-Sound Studio	300
2.	Television Production Unit	1,960
	TV Studio 1	580
	TV Studio 2	200
	TV Studio 3	200
	Area for CTA, etc.	980

3.	Film Production Unit (Studio, Processing, Editing, working areas and film storage).	485
4.	AV Unit	460
5.	Machine Room, W.C. and Passages	795
6.	Prop and Set Construction Workshop	440
	Total	4,855

3-4-2 Equipment Approx. $ 3,200,000

Equipment needed for the Centre for Educational Broadcasting is as follows:

Description of Equipment Items	Amount Requested	Total Cost (US$)
A. Radio Production Units		(Prices depending on market value)
Radio Studio 1,2,3 and 4 (Same composition)		
AUDIO MIXING CONSOLE	1	
TAPE RECORDER/REPRODUCER	3	
DISC PLAYER	2	
MICROPHONE	1	
MICROPHONE STAND	1	
MONITOR SPEAKER SYSTEM	3	
1 SECOND SLAVE CLOCK	2	
ACCESSORIES	1	

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Radio Studio 5 and 6 (Same composition)		
AUDIO MIXING CONSOLE FOR STEREOPHONIC	1	
TAPE RECORDER/REPRODUCER FOR STEREOPHONIC	3	
DISC PLAYER FOR STEREOPHONIC	2	
MICROPHONE FOR STEREOPHONIC	1	
MICROPHONE STAND	1	
MONITORING SPEAKER SYSTEM FOR STEREOPHONIC	4	
1 SECOND SLAVE CLOCK	2	
ACCESSORIES	1	
MAINTENANCE INSTRUMENT FOR SOUND EQUIPMENT	1	
B. TELEVISION PRODUCTION UNIT		
TV STUDIO-1		
CAMERA		
COLOR CAMERA (2/3-INCH SATICON X 3)	3	
ZOOM LENS (X 13)	3	
CAMERA PEDESTAL	3	
CAMERA CABLE	3	
VIDEO EQUIPMENT		
VIDEO SWITCHER	1	
MIXER-KEYER AMPLIFIER	2	
WAVEFORM GENERATOR	1	
CHROMA-KEY GENERATOR	1	
CABINET RACK ASSEMBLY	1	
PD/SWITCHER CONSOLE	1	
VE CONSOLE	1	
AUDIO EQUIPMENT		
AUDIO MIXING CONSOLE	1	
TAPE RECORDER/REPRODUCER	2	
DISC PLAYER	2	
MICROPHONE	1	
MICHROPHONE STAND	1	

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MONITORING EQUIPMENT		
9-INCH PICTURE MONITOR	1	
12-INCH PICTURE MONITOR	11	
20-INCH COLOR MONITOR	6	
WAVEFORM MONITOR	1	
VECTORSCOPE	1	
AUDIO MONITOR	3	
LIGHTING EQUIPMENT		
MOTORIZED BATTEN SUSPENSION SYSTEM	1	
DIMMER SYSTEM	1	
LIGHTING VALVE	1	
TV STUDIO 2 & 3 (same composition)		
CAMERA		
COLOR CAMERA (2/3 INCH SATICON X 3)	2	
ZOOM LENS (X 13)	2	
CAMERA PEDESTAL	2	
CAMERA CABLE	2	
VIDEO EQUIPMENT		
VIDEO SWITCHER	1	
MIXER-KEYER AMPLIFIER	2	
CHROMA-KEY GENERATOR	1	
WAVEFORM GENERATOR	1	
CABINET RACK ASSEMBLY	1	
PD/SWITCHER CONSOLE	1	
VE CONSOLE	1	
AUDIO EQUIPMENT		
AUDIO MIXING CONSOLE	1	
TAPE RECORDER/REPRODUCER	2	
DISC PLAYER	2	
MICROPHONE	1	
MICROPHONE STAND	1	

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MONITORING EQUIPMENT		
9-INCH PICTURE MONITOR	1	
12-INCH PICTURE MONITOR	10	
20-INCH PICTURE MONITOR	3	
COLOR RECEIVER/MONITOR	3	
WAVEFORM MONITOR	1	
VECTORSCOPE	1	
AUDIO MONITOR	3	
LIGHTING EQUIPMENT		
DIMMER SYSTEM	1	
FIXED LIGHTING GRID	1	
LIGHTING EQUIPMENT HANGER	1	
LIGHTING VALVE	1	
VTR EQUIPMENT		
3/4-INCH U-MATIC VTR	2	
EDITING SYSTEM	1	
TBC	1	
SMPTE TIME SIGNAL GENERATOR	1	

THE ABOVE LISTED COMBINATION OF VTR EQUIPMENT ARE INSTALLED IN EACH TV STUDIO. ADDITIONAL TWO SETS OF VTR EQUIPMENT ARE INSTALLED IN VIDEO EDITING ROOM TOGETHER WITH MONITORING EQUIPMENT.

3-4-3 Experts and Training

a) Request assistance in organizing training in Japan

(1) Group or individual training or special training

(2) Training for maintenance engineers

(3) On-the-job training

Project	Activities
Training in Japan (1) Group or individual training or Special training	S.T.O.U. wishes to send some producers and engineers to attend group or individual training courses in Japan provided by JICA at an earliest opportunity so that the staff may become key personnel for EBPC. After the exchange of Notes between the Government of Japan and the Government of the Kingdom of Thailand, S.T.O.U. needs to send 4 producers and 4 engineers for special training in Japan for the period of 3 months before the completion of the EBPC, depending on the convenience of the Japanese side.
(2) Training for maintenance engineers	Before the shipping period of equipment for the EBPC, three engineers (one camera operator, one VTR operator, and one video equipment operator) are requested for training for 2-3 months at respective broadcasting stations or supplier's factories so that they may return to Thailand before the installation of the equipment at the EBPC.

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(3) On-the-job training at broadcasting stations in Japan	S.T.O.U. wishes to send 4 or more production staff and 4 or more technical staff to attend on-the-job training at certain broadcasting station for the period of 4-6 months.

b) Experts for training in Thailand

Request experts in production and engineering from Japan to conduct in-country workshops:

The experts from Japan are needed to conduct workshops for S.T.O.U. production and technical staff so that they can learn to work with equipment and technology provided from Japan.

Job description of the experts requested is as follows:

(1) To organize a workshop;

(2) To conduct a workshop;

(3) To help in workshop evaluation; and

(4) To make recommendations with regard to training needs.

Project	Activities
Training in Thailand	Training in Thailand are mainly group training for production and technical staff during 1984-1985. The expected trainings are television production workshop. Experts in production and engineering from Japan are requested to conduct the workshops.

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(1) Television Production Workshop.	Two workshops will be organized for 30 staff (15 trainees for each workshop)
(2) Radio Production Workshop.	Two workshops will be organized for 30 staff (15 trainees for each workshop).
(3) Technical Production Workshop	Four technical production workshops will be organized for 60 staff (15 trainees for each workshop).

3-5 Future Plan

Based on the long-term plan of S.T.O.U., about 5,430 rolls of radio programme packages and 1,810 rolls of TV programme packages will have to be produced and stocked before the end of 1986 academic year. Moreover, production of Public Relation Programmes for general listeners or viewers is to be carried out by utilizing a part of the above programme resources and by using radio and TV studios in EBPC effectively.

Furthermore, S.T.O.U. is planning to make utilize this EBPC as a center of production of audio and visual educational materials which will be widely used by many other national universities under the administration of "The Office of University Affairs" in the near future.

3-6 Requesting Agency for this Project

Sukhothai Thammathirat Open University,
Office of University Affairs
Sri Ayuthaya Road, Bangkok, Thailand

3-7 Related Outside Organizations for this Project

To implement all this project S.T.O.U. will need the cooperation of various outside organizations with regard to both facilities and services. Major outside organizations are:

1. The Department of Public Relations for the second radio network to broadcast S.T.O.U.'s radio programmes, and seven PRD provincial television stations;
2. Commercial television station channel 7;
3. The Communications Authority of Thailand for Postal Services and Telecommunication;
4. National Mass Communication Authority, for broadcasting S.T.O.U. television programmes via channel 9;
5. Others, such as educational institutions, business organizations, hospitals, and factories for the provision of laboratories to S.T.O.U. students.

SECTION 4

OUTLINE OF THE PROJECT

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4-1 The items specially taken into consideration for the study of basic design

During the period of survey at site, a lot of opinions have been exchanged frankly between the survey mission team and the S.T.O.U. staffs concerned.

It is, therefore, fully assured that the following basic design will meet with the design concept proposed by S.T.O.U.

However, the scope of this basic design has to be limited within building and programme production facilities directly related to the programme production activity of S.T.O.U. for their own educational services due to the limited amount of budget expected for this Grant Aid by the Government of Japan.

Accordingly, facilities for film programme production, audio/visual service, photographic service and graphic design service were all excluded from the scope fo this basic design because most of these facilities will not have to be taken into consideration for systematic design as in the case of radio and TV production facilities and it can be dealt with as simple installation work of independent unit or equipment.

Nevertheless, radio and TV studio facilities and its building for production of educational radio and TV programmes are designed systematically to be provided with every necessary function as an independent "Educational Broadcasting Production Centre".

4-2 The fundamental conditions settled for basic design

The major items of fundamental conditions to be furnished with "Educational Broadcasting Programmes Production Centre" are as follows:

4-2-1 Broadcasting programme production activities at S.T.O.U. are the most important part of "Distance Teaching System" together with the preparation of textbooks and workbooks for self-learning by each isolated student. This is slightly different from the case of programme production activity at normal broadcasting station which is a part of substantial activity of broadcasting station.

From this point of view, it is necessary to provide E.B.P.C. with favourable programme production system which is composed of suitable equipment for easy handling and operation even by the staff who is not well experienced in the field of programme production such as educational expert in S.T.O.U.

4-2-2 On the other hand, all radio and TV programmes produced and recorded on magnetic tape at E.B.P.C. are generally used as an original master tape when making a lot of copies for the purpose of distribution to Local or Regional Study Centres of S.T.O.U. Those dubbed tapes are widely utilized by local students for their self learning at each study centre. At the same time, these master tapes are also used as programme sources for nationwide transmission of educational radio and TV programmes through existing broadcasting networks operated by governmental or private broadcasting organisations other than S.T.O.U.

Therefore, the picture quality and electrical specifications of these master tapes should be kept at as high levels as the professional quality standards adopted by normal broadcasting stations.

4-2-3 However, it will be necessary to arrange such simple equipment as non-adjustment equipment when the whole programme production system are designed for E.B.P.C. in consideration of the fact that professional knowledge of S.T.O.U. staff on the operation of programme production facilities and equipment is generally lower than that of professional staff of normal broadcasting station.

4-2-4 When designing the studio building and its facilities including programme production system, it is necessary to consider that basic design should be capable of easy future expansion in response to the requirement of increasing programme production capability in the near future.

4-2-5 Furthermore, the total system design should be fully capable of immediate introduction of more advanced equipment without modifying main part of original system to be able to catch up with fast advancing broadcasting technology.

4-2-6 It will be useful to proceed basic design for E.B.P.C. along with the long term operational plan of S.T.O.U. Then mission member have been trying to discuss about the propriety of the long-term operational plan prepared by S.T.O.U. and it was confirmed that the long term plan of S.T.O.U. is quite adequate based on the reasons as mentioned below:

(1) Programme production plan in relation to the study course

According to the long-term plan of S.T.O.U., the number of study courses is to be increased up to 362 during the period of 6 years (1981-1986).

For each study course, 15-17 radio programmes and 5-7 TV programmes (in average) are planned to combine with each textbook in accordance with the progress of study course.

Therefore, about 5,430 rolls of radio programme packages and 1,810 rolls of TV programme packages will have to be produced and stocked before the end of 1986 school year as shown in Table-1.

(2) Necessary number of studios and its programme production facilities

According to the S.T.O.U.'s long-term plan, six radio studios and three TV studios are to be arranged before 1986.
This plan can be said reasonable in view of the following background:

(a) Radio programmes

It is agreeable, in general, that most of the educational radio programmes would be simple talk programmes. Then, an assumption that 80% of S.T.O.U. radio programmes are talk programmes and the remaining 20% may be group talk (discussion) programmes or dramatised programmes would be reasonable.

The necessary studio occupancy hour for one unit of radio programme production will be 1-2 hours if it is a simple talk programme and 1-3 hours for a group talk or dramatised programme based on the fact that normal time length of each unit of radio programme is 20 minites.

For additional editing work of the above programmes produced and recorded in studio, it will be necessary to occupy the editing room for 3-4 hours until it is edited as a complete programme package ready for transmission or distribution.

Then, if it is assumed that normal studio operation hour per day is 8 hours, 4 talk programmes or 2 group talk or dramatised programmes can be produced in each studio per day.

If the above mentioned assumptions are applied to the number of study courses in 1986 and all studios are assumed to be in operation for 260 days per year, the necessary number of radio studios at E.B.P.C. will be as follows:

Studio for talk programme production

$$5{,}430 \times 0.8 \div 260 \div 4 = 4 \text{ (rooms)}$$
$$(80\%)\ (\text{days})\ (\text{programme/day})$$

Studio for group-talk or dramatised programme

$$5{,}430 \times 0.2 \div 260 \div 2 = 2 \text{ (rooms)}$$
$$(20\%)\ (\text{days})\ (\text{programme/day})$$

Editing equipment

$$5{,}430 \times 0.5 \div 260 \div 2 = 5 \text{ (sets)}$$

(b) TV programmes

Such a large scale drama programme as entertainment TV programme at normal TV broadcasting station will not be used for educational broadcasting.

However, application of dramatised programme segment will be effective for introducing some phenomena in scientific experiment and for showing some social programme or historical event in the educational TV programmes of S.T.O.U.

Similarly, in case of TV programme for the study course of social science, real outside scene are frequently used as a segment of this kind of programme.

Accordingly, a part of programme produced in the studio will be rather small because the greater part of programme is composed of such location-shot programmes.

Then, the above mentioned conditions can be applied to the actual educational TV programme production activity at S.T.O.U., and the result of analysis will be as follows:

Studio production : 80% of total number of TV programmes

Location : 20% of total number of TV programmes

Editing work : shown in Fig. 1.

Now, assume again 8 hours studio operation per day and time length of normal TV programme of S.T.O.U. being 30 minutes, two TV programmes can be produced in one TV studio per day because necessary studio occupancy hour will be 2-4 hours for each TV programme production. The necessary working time for a normal location-shot programme will be about 2 days and one and a half day will be needed until the whole editing work is completed for one TV programme package.

Then, the following number of studios and equipment will be needed at the end of 1986 school year as shown in Table-2.

TV studio 1,810 X 0.8 ÷ 260 ÷ 2 = 3 (rooms)

Equipment for location 1,810 X 0.2 ÷ 260 X 2 = 3 (sets)

Editing equipment 1,810 X 0.2 ÷ 260 X 1.5=2 (sets)

Note:

1. Number of programme production by location-shot can be decreased to about 20% of total number of programmes after completion of new E.B.P.C. facilitie Until then, percentage of location-shot programmes should unavoidably be high to compensate for poor studio production capability. This situation can be exemplified by the curve as shown in Fig.1.

Table-1 Number of planned and opened study course and its accompanying radio and TV programmes

	1980/81	1982	1983	1984	1985	1986
Number of planned course	21	54	89	81	76	41
Number of opened course	21	75	164	245	321	362
Number of radio programmes	315	1125	2460	3675	4815	5430
Number of TV programmes	105	375	820	1225	1605	1810

Table-2 Number of required equipment and facilities for TV programme porduction

	1982	1983	1984	1985	1986
Number of radio studio (rooms)	1	3	4	5	6
Number of audio tape editing room	2	5	5.5	5	5
Number of TV studio (rooms)	1	2	3	3	3
Number of equipment for location (set)	3	3	3	3	3
Number of VTR editing equipment (set)	2	5	3.5	2	2

2. The amount of editing work can be decreased year by year owing to the greater availability of programme production studios as well as the upgraded expertness of programme production staff in S.T.O.U. This transition is shown by the curve in Fig.2.

3. Necessary number of studios in foreseeable future for new production of radio and TV programmes for the opening of new study courses and additional programme production for the renewal of stocked programmes can be estimated by the following calculation.

Even newly produced programme can not be repeatedly used for many years without amendment because it will be unavoidable to amend programme contents and expression partially in accordance with the change of social circumstances or in order to introduce new achievements in economic or technological activities into the programme. Therefore, it is generally considered that programme produced for each study course can be used repeatedly for three years at the longest under such fast changing social circumstances as today.

Accordingly, S.T.O.U. is planning to renew one quarter of programmes which was newly produced for new study course within three years and all of the remaining three quarters of the above programmes are planned for renewal in fourth year after it is newly produced.

Incidentally, it is a system quite similar to one adopted by Open University in Japan.

Such S.T.O.U. plan as mentioned above can be said quite reasonable.

Relations between number of studios required for production of new programme and renewal programme are shown in the following table -3 & 4.

Fig.1 Presummed transition of programme production portion by Location

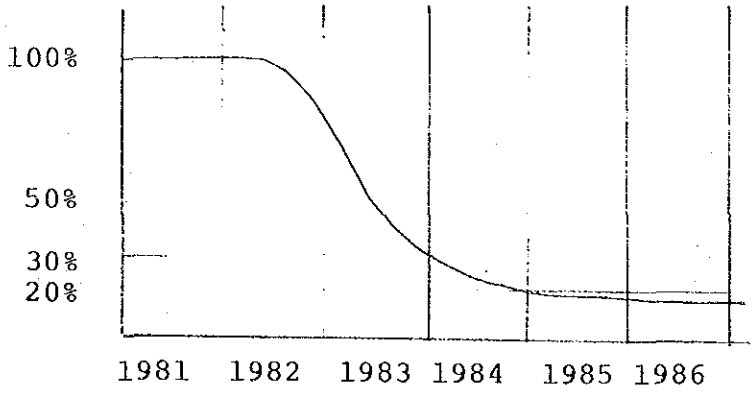


Fig.2 Presummed transition of editing work

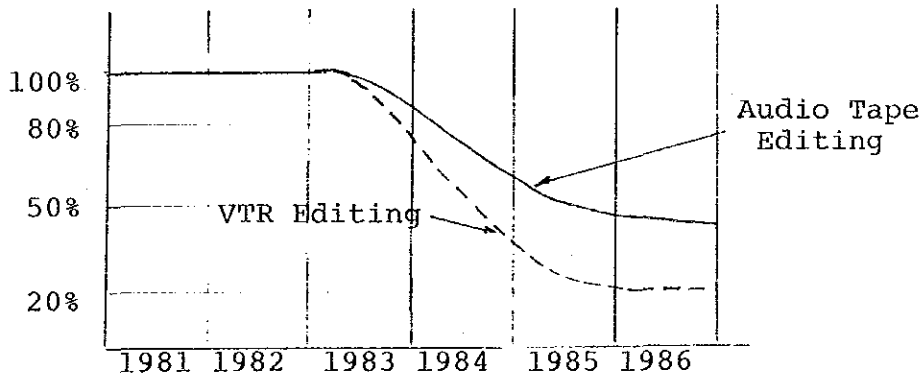


Table-3 Relation between number of radio programme production and necessary number of studios

Number of newly produced programmes \ year	1979 ~ 1981	1982	1983	1984	1985	1986	1987	1988	1989
315 (a)	a		1/4a	3/4a		1/4a	3/4a		1/4a
810 (b)		b		1/4b	3/4b		1/4b	3/4b	
1335 (c)			c		1/4c	3/4c		1/4c	3/4c
1215 (d)				d		1/4d	3/4d		1/4d
1140 (e)					e		1/4e	3/4e	
615 (f)						f		1/4f	3/4f
x							(x)		
y								(y)	
z									(z)

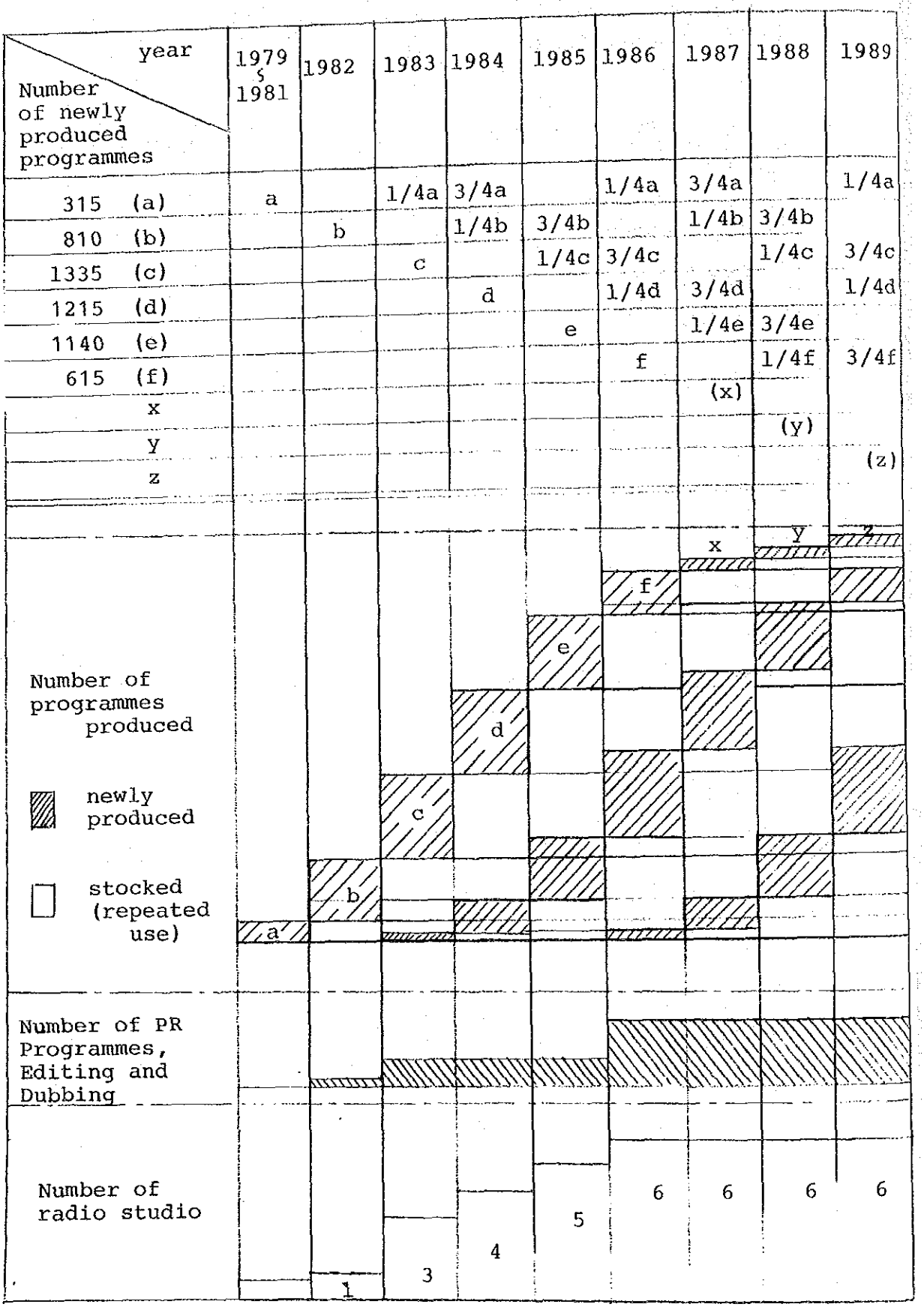
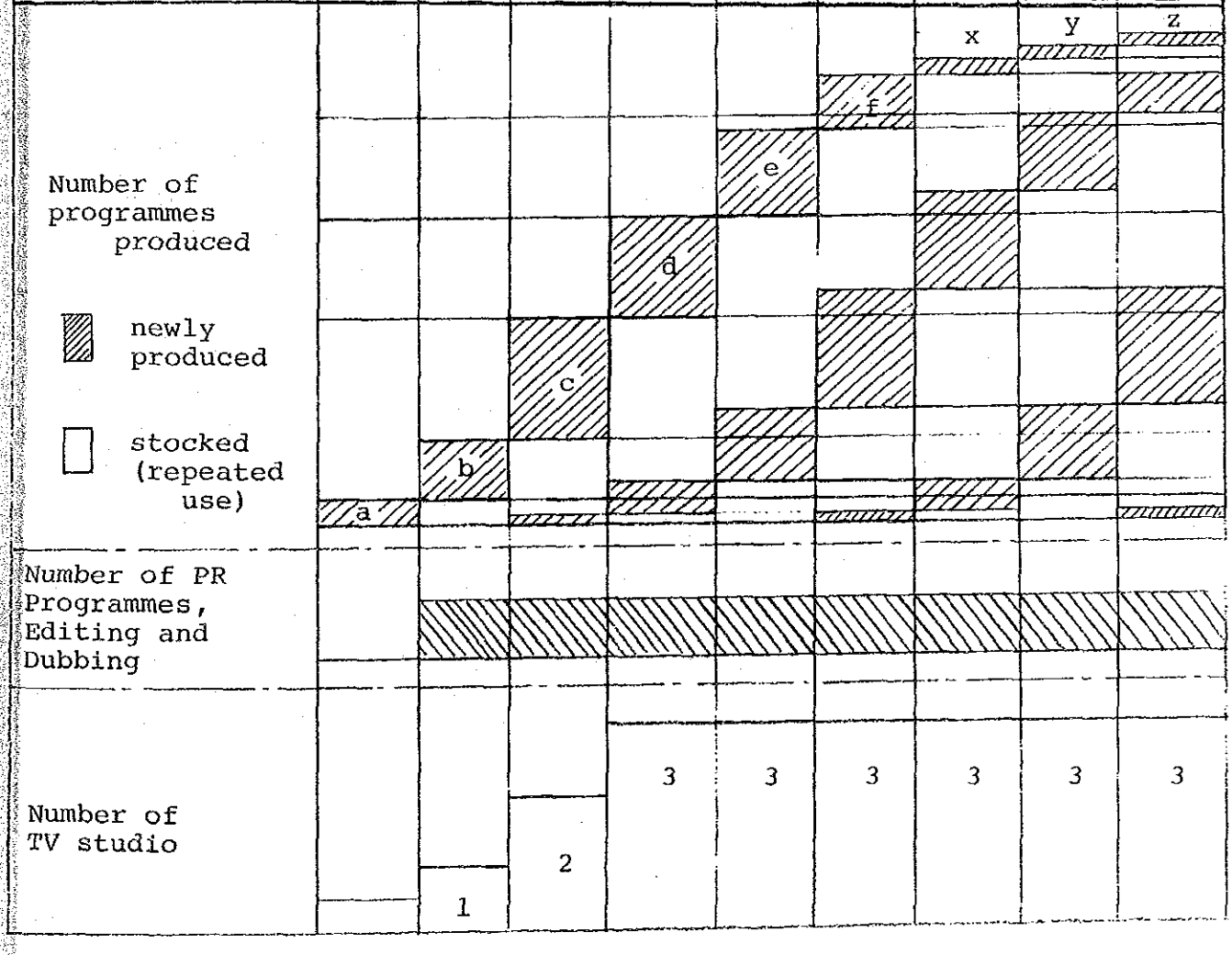


Table-4 Relation between number of TV programme production and necessary number of TV studios

Number of newly produced programmes \ year	1979 ∫ 1981	1982	1983	1984	1985	1986	1987	1988	1989
105 (a)	a		1/4a	3/4a		1/4a	3/4a		1/4a
270 (b)		b		1/4b	3/4b		1/4b	3/4b	
445 (c)			c		1/4c	3/4c		1/4c	3/4c
405 (d)				d		1/4d	3/4d		1/4d
380 (e)					e		1/4e	3/4e	
205 (f)						f		1/4f	3/4f
x							(x)		
y								(y)	
z									(z)



4-3 Programme Production Facilities

4-3-1 Fundamental conditions to be taken into consideration

Though fundamental conditions settled for basic design has already been mentioned in SECTION 4-2, the following practical conditions should also be fulfilled.

(1) PAL-B Colour Standard System shall be applied to all systems and equipment to be installed in E.B.P.C.

(2) 1" Helical Scan VTR (Tape Format C) shall be used for recording and 1" Helical Scan VTR or 3/4" U-matic VTR (high-band) shall be used for the purpose of programme insertion. When installing those, two sets of the same type VTR should be arranged as one pair in consideration of editing capacility.

(3) Projectors for Telecine-chain shall be composed of one each of 8 m/m and 16 m/m film projector and a 35 m/m slide projector.

(4) TV Colour Camera should be three pick-up tube type. Though studio type colour camera is, in general, the most preferable, ENG / EFP type camera can be used in place of studio type camera if it satisfies the following conditions.

a. It is possible to make colour alignment between several sets of camera in the same studio and operation of camera is quite stable.

b. It is capable of making smooth camera work by means of zoom-lens operation or by use of camera steering and moving mechanism.

c. A view-finder with enough resolution and satisfactory characteristics is provided for the convenience of cameraman's operation.

d. It is capable of compensating video signal transmission characteristics when camera is operated with a longer extended cable than standard camera cable length.

e. It is capable of chroma-key operation.

(5) In case ENG/EFP type camera is adopted for studio camera, camera chain system should be capable of being compatible with standard studio type camera.

(6) VTR and Telecine system should be capable of future expansion without necessity of large scale modification of original design.

(7) All equipment installed should be designed to fit power supply system of 380/220 volt, 3 phase 4 wire or 220 volt single phase (one of phase voltage in 380/220 3 phase power supply system).

(8) Master control system will not be installed until it becomes necessary because direct on-air operation is not carried out by E.B.P.C. for the time being.

(9) Each radio studio shall be designed as independently operable system.

(10) VTR, Telecine systems, Flying Spot Scanner and Character Generator should be designed for common use by all TV studio on a sharing basis.

4-3-2 Major Items of Programme Production Equipment and Systems to be installed in E.B.P.C.

(1) Radio Studio Facilities

i) Studio equipment for radio programme production

ii) Audio tape editing equipment

(2) TV Studio Facilities

i) Studio equipment for TV programme production

ii) Video tape recording equipment

iii) Video tape editing equipment

iv) Telecine equipment

v) Audio signal, video signal and other signals distribution equipment

(3) Clock System

(4) Intercom System

(5) Measurement Equipment

(6) Accessories, spare units and spare parts

4-3-3 Main usage of the above equipment and systems

(1) Radio Studio Facilities

i) Studio equipment for radio programme production

Audio signal control systems, tape recording and playback equipment, disc-player, monitoring equipment, announcer's desk and microphones are installed in each radio studio (including accessories) and used for radio programme production and recording.

ii) Audio tape editing equipment

Audio tape editing equipment and its accessories are installed in each editing room and used for editing work of recorded audio tape.

(2) TV Studio Facilities

i) Studio equipment for TV programme production

One complete set of equipment and systems necessary for TV programme production such as colour TV cameras, video signal control system, audio signal control system, studio lighting system and accessories are installed in each TV studio and are used for production of colour TV programmes, sound dubbing work and for complicated editing work of TV programmes.

ii) Video tape recording equipment

One inch helical scan video tape recorders for PAL-B colour TV signal are installed in VTR room and used for recording of TV programmes produced in studio or playback of TV programme segment recorded preliminarily on one inch video tape for the purpose of insertion when production work of complete TV programme package is carried out in TV studio.

In some cases, those 1" VTRs are also used for editing work of pre-recorded 1" video tape.

iii) Video tape editing equipment

3/4" High-band U-matic type VTRs are installed in VTR room and used for editing work of preliminarily recorded video tape which was picked up and recorded by the same type VTR machine at outside of studio.

In some case, those U-matic VTRs are also used for programme insertion at the time of producing programme in TV studio if inserting TV programme segment is pre-recorded on 3/4" tape. In some other case, those U-matic VTRs are used for dubbing work (transcription of original TV signal recorded on 1" master tape to 3/4" dubbing tape) for the purpose of TV programme distribution by means of recorded video tape.

iv) Telecine equipment

Telecine chain composed of a colour camera, one each of 8 m/m and 16 m/m film projector and a 35 m/m slide projector are installed in Telecine room and used for supplying of programme resources recorded on movie film or slide for the purpose of insertion or mixing of TV programme segment.

v) Audio signal, video signal and other signal distribution equipment

These equipment are installed in central equipment room (Technical apparatus room) and used for the following operation:

a) To distribute (switching and connection) TV signal output in each TV studio to assigned VTR.

b) To distribute (switching and connection) output signals of VTR or Telecine chain to each TV studio as one of input signals to video signal control console and audio signal mixing console.

c) To exchange tally signals between TV studio and VTR or Telecine chain in response to the line connection as mentioned in a) and b).

vi) Synchronizing signal generation and distribution equipment

This system is to generate and distribute 7 kinds of synchronizing signal necessary for the operation of various kinds of colour TV equipment in E.B.P.C.

(3) Clock System

Quartz clocks are installed in radio and TV studios and Technical apparatus room and used for indicating correct time for the benefit of operating staff.

(4) Intercom System

This system is used for communication between programme production staff and engineering staff during the period of programme production activities.

(5) Measurement Equipment

These measuring equipment are used for the purpose of daily checking of operating condition of equipment and systems installed as well as general maintenance services.

(6) Accessoreis, spare units and spare parts

Accessory is attached to each equipment to develop full function given originally to the equipment.

All of the spare units and parts are utilized for maintenance service to keep every function and characteristic given to each equipment and system at the time they are newly installed.

4.3.4 Equipment Arrangement Plan

(1) Equipment for radio programme production

Location of installation	Name of equipment	Quantity	Outline of specification
Radio studio No.1 & No.2	1) Audio signal control system	1	1) 12 input terminals and output terminals for recording and monitoring shall be provided 2) Output signal level indicator shall be provided within the system 3) The system shall be of professional quality to meet with every requirement for broadcast use
	2) Audio tape recorder & reproducer		1) The equipment shall be of professional quality for broadcast use
	a. Open reel type	2	
	b. cartridge type	1	
	3) Disc player	2	1) The same as above
	4) Echo machine	1	1) ditto
	5) Microphone & mike-stand	10	1) ditto
	6) Monitor system	1 set	1) ditto

Location of installation	Name of equipment	Quantity	Outline of specification
Radio studio No.3 — No.6	1) Audio signal control system	1	1) 8 input terminals and output terminals for recording and monitoring shall be provided 2) Output signal level indicator shall be provided within the system 3) The system shall be of professional quality to meet with every requirement for broadcast use
	2) Audio tape recorder & reproducer		1) The equipment shall be of professional quality for broadcast use
	a. Open reel type	2	
	b. Cartridge type	1	
	3) Disc player	2	1) The same as above
	4) Microphone & mike-stand	10	1) ditto
	5) Monitor system	1 set	1) ditto

(2) Equipment for TV programme production

Location of installation	Name of equipment	Quantity	Outline of specification
TV Studio No.1	1) Camera system	4	1) All of the unit, equipment and system shall meet the requirement of PAL-B Colour TV standard system 2) Three pick-up tubes type system shall be adopted 3) Pan & Tilt steering and zooming operation shall be carried out smoothly by means of suitable mechanism 4) Output terminal for chroma-key operation shall be provided 5) Camera system shall be operable with extended camera cable 6) The system shall be of professional quality for broadcast use
	2) Video signal control system	1	1) Video special effect operation such as chroma-key shall be capable 2) The system shall be of professional quality for broadcast use
(Continued on page 50)			

(Continued from page 49)	3) Audio signal control system	1	1) 16 input terminals and output terminals for recording and monitoring shall be provided 2) Output signal level indicator shall be provided within the system 3) The system shall be of professional quality for broadcast use
	4) Audio tape recorder & reproducer		1) The equipment shall be of professional quality for broadcast use
	a. Open reel type b. Cartridge type	2	
	5) Disc player	2	1) The same as above
	6) Echo machine	1	1) ditto
	7) Microphone & mike-stand	10	1) ditto
	8) Studio lighting system	1 set	1) The system shall be composed of lighting batten system and SCR dimmer system
	9) Audio & video signal monitoring system	1 set	1) The system shall be of professional quality for broadcast use

Location of installation	Name of equipment	Quantity	Outline of specification
TV Studio No.2 & 3	1) Camera system	2	1) The same as camera system for TV studio No.1
	2) Video signal control system	1	1) The same as video signal control system for TV studio No.1
	3) Audio signal control system	1	1) The same as audio signal control system for TV studio No.1 except number of input terminal is 12 or 16
	4) Audio tape recorder & reproducer		1) The equipment shall be of professional type for broadcast use
	a. Open reel type	2	
	b. Cartridge type	1	
	5) Disc player	2	1) The same as above
	6) Microphone & mike-stand	10	1) ditto
	7) Studio lighting system	1 set	1) The system shall be composed of of fixed lighting system and SCR light control system
	8) Audio & video signal monitoring	1 set	1) The system shall be of professional quality for broadcast use

Location of installation	Name of equipment	Quantity	Outline of specification
VTR Room	1) 1" Helical-scan VTR system	4	1) The system shall be capable of video recording and play-back as well as editing operation 2) The system shall be of professional quality for broadcast use
	2) 3/4" High-band U-matic VTR	4	1) The system shall be capable of video recording and play-back as well as editing operation 2) A T.B.C. shall be attached to a pair of same type VTRs 3) The equipment and system shall be professional quality for broadcast use
	3) Audio & video Signal monitoring System	1 set	1) The system shall be professional quality for broadcast use
Telecine Room	1) Telecine chain	2	1) The system shall be composed of 8 m/m & 16 m/m film projector and 35 m/m slide projector and a colour camera system 2) The system shall be professional quality for broadcast use
	2) Opaque Projector System	1-2	1) The same as above
	3) Audio & video signal monitoring	1 set	1) The system shall be of professional quality for broadcast use

Location of installation	Name of equipment	Quantity	Outline of specification
Central Apparatus Room	1) Synchronizing signal generation & distribution system	1 set	1) Sync signal system shall be met with PAL-B Colour TV standard system 2) Stand-by sync signal generator with automatic instant switch-over system shall be provided 3) The system shall be of professional quality for broadcast use
	2) Audio signal, video signal distribution system and switcher, phase adjustment system	1 set	1) The system shall be of professional quality for broadcast use
	3) Charactor Generator System	2 sets	1) The same as above
	4) Audio & video signal monitoring system	1 set	1) The same as above
Maintenance Room	1) Measurement Equipment	1 set	1) The same as above
	2) Spare Parts, Spare Units	1 set	

4-4 Building

4-4-1 Basic Conditions

(1) Office of Educational Technology (O.E.T.) is planned to be located generally in the Main Office Buildings (M.O.B.), and only such functions that are essential to broadcasting programme production are to be accommodated collectively in the Educational Broadcasting Production Centre (E.B.P.C.) building.

(2) Main space factors assigned to E.B.P.C. are as follows:

a) Radio studios with control rooms
b) TV studios with control rooms
c) VTR room
d) Tele-cine room
e) Common apparatus room
f) Equipment storage
g) Maintenance room
h) Tape storage
i) Editing room
j) Rehearsal room
k) Meeting and rest room for actors
l) Setting area and workshop
m) Dressing, costume, make-up room
n) Staff offices
o) Power and airconditioning equipment room
p) Other related rooms

(3) Staff offices shall be allocated to M.O.B. and E.B.P.C. respectively according to the following Table-5.

Table-5

	OFFICES	M.O.B.	E.B.P.C.
1.	Director's Office Secretariat Office	o o	
2.	Media Design and Research Division	o	
3.	Production Engineering Division a. Radio b. Television c. Film	 o	 o o
4.	Production Administration Division (including Production Library)	o	Δ
5.	AV Centre a. Photography and Microfilm Unit b. Graphic Unit c. AV Services Unit d. Three Dimensional Media Unit e. Tutorial Media Production Unit	 o o o o o	 Δ
6.	Educational Radio Centre a. Programming b. Production	 o 	 o
7.	Educational TV Centre a. Programming b. Production c. Dresses and Make-Up	 o 	 o o
8.	Educational Film Centre a. Programming b. Production c. Dresses and Make-Up	 o o o	
9.	Information and Documentation Centre	o	
10.	University Press (in Separate Building)	x	

* o Permanent office

Δ Branch office

x Independent building

(4) Floor area requirements for offices and other staff rooms shall be based on the following estimated number of personnel.

a) Production administrative staff.	10
b) Radio programme production staff Producers/Directors Assistant Producers	20
c) TV programme production staff Producers/Directors Assistant Producers	25
d) Programme production tehcnical staff	50
e) Make-up and dressing staff	5
f) Building operation and maintenance staff	3
g) Building guard staff	2
h) Studio setting staff	10

*: Number of personnel who actually work in E.B.P.C. is foreseen to exceed the above estimate. However, most of them will not stay in offices all day, but will work at the respective working spots (studio etc.) by shifts. Therefore, considering that there is a certain percentage of common use of office space, the above numbers are to be used for working out of the office floor area.

(5) In order to secure proper operation of various delicate apparatus used in E.B.P.C., air-conditioning and cooling system shall be introduced.

The target condition of each room shall be 27°C and 60%. Capacity of the system is to be designed in consideration of the heat generation (or power consumption) tabulated below.

Floor	Room Names	Heat Source		Description
		Number of Personnel	Equipment	
1st Fl.	Studio TV No.1	20	100 KVA	
	Studio TV No.2	10	50 KVA	
	Studio TV No.3	10	50 KVA	
	Make-up/Dressing Rm.	20		
	Performer's Meeting Rm.	40		
	Rehearsal Room	20		
	Production Control Staffs	10		
	TV Programme Production Staffs	25		
	Building Maintenance Staffs	5		
	Setting Staffs and Workers	10		
2nd Fl.	Control Room TV No.1	6	5 KVA	
	Control Room TV No.2	6	5 KVA	
	Control Room TV No.3	6	5 KVA	
	Dimmer Rack		13 KW	=11,000 Kcal/Hr Average 70% = 7,700 Kcal/H
	Common Equipment	2	30 KVA	
	VTR	5	15 KVA	
	Tele-cine	2	15 KVA	
	Announce Booth	1	0.5 KVA	
	Technical Staffs of Programme Production	40		
	Maintenance Staffs	5	5 KVA	
	Video Tape Storage	2		

3rd Fl.	Studio Radio No.1	10		
	Studio Radio No.2	10		
	Studio Radio No.3	2		
	Studio Radio No.4	2		
	Studio Radio No.5	2		
	Studio Radio No.6	2		
	Control Room Radio No.1	2	2 KVA	
	Control Room Radio No.2	2	2 KVA	
	Control Room Radio No.3	2	2 KVA	
	Control Room Radio No.4	2	2 KVA	
	Control Room Radio No.5	2	2 KVA	
	Control Room Radio No.6	2	2 KVA	
	Performer's Meeting Rm.	40		
	Rehearsal Room	10		
	Radio Programme Production Staffs	20		
	Technical Staffs of Programme Production	10		
	Tape Storage	2		

(6) Storages for sound tapes and VTR tapes shall be provided. These rooms shall have enough space to stock raw tapes for one month consumption, but, need not cater for those already recorded.

7 inch open reel tape

5,430 programmes/12 months x spare factor (1.5) = 750 tapes

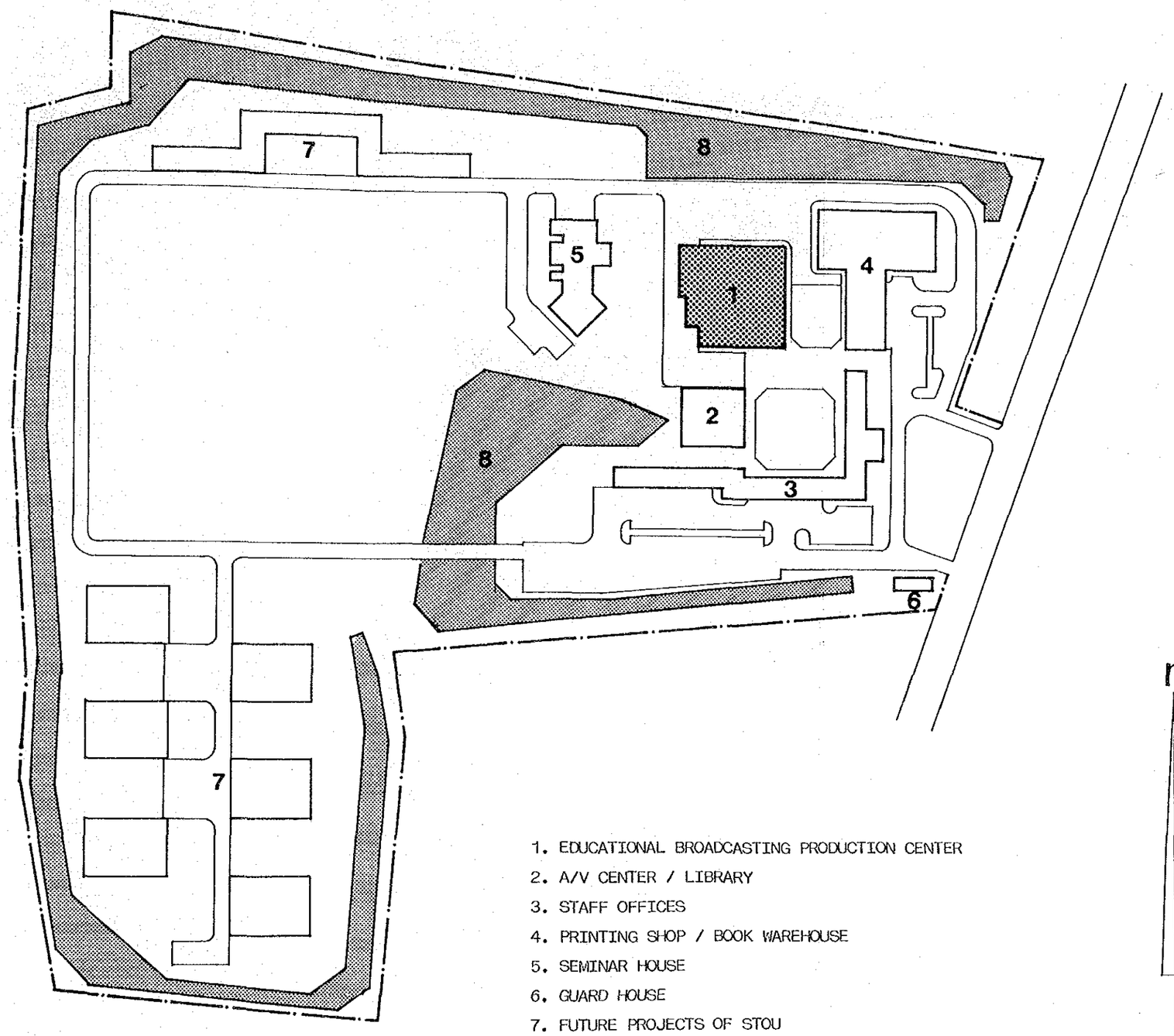
1 inch VTR tape

1,810 programme/12 months x spare factor (1.5) = 225 tapes

4-4-2 Building

(1) Plot Plan

The design for STOU Headquarters (HQ) to be constructed by STOU has been completed. In the design, the HQ is to be located in a part of the site which covers an area of 12 acres and borders on the public road. The HQ



1. EDUCATIONAL BROADCASTING PRODUCTION CENTER
2. A/V CENTER / LIBRARY
3. STAFF OFFICES
4. PRINTING SHOP / BOOK WAREHOUSE
5. SEMINAR HOUSE
6. GUARD HOUSE
7. FUTURE PROJECTS OF STOU
8. BUN & DYKE

n

EBPC STOU
EDUCATIONAL BROADCASTING PRODUCTION CENTER
SUKHOTHAI THAMMATHIRAT OPEN UNIVERSITY

consists of the building housing the Registration and Record Office, the Rector's Office and the Instructor's Office, the Book Warehouse, the Printing Shop, the building housing the AV Centre and the storage, which are located around the yard, and the building for Seminar Centre and Dining Hall, which is located north-west.

Location of the E.B.P.C. building should preferably be at the centre of the whole site in order to minimize possible negative influence of noise from public road and neighboring noisy factories which may be constructed in future. The location has been planned, as shown on the drawings, in consideration of the said noise, space for expansion of the E.B.P.C. building and functional connection with the other buildings of the HQ.

Design for the private internal circulation road and other facilities in the site has been completed as a part of the design for the Headquarters, and other part of the road are now under construction. The design will therefore be partially amended by S.T.O.U. in consideration of the preliminary design for E.B.P.C. proposed by the Japanese side.

(2) Floor Plan

i) The following is considered in floor planning:

a. Necessary and sufficient function for radio and TV program production.

b. Functional connection with the other buildings of the HQ and

c. Possibility of future expansion of the E.B.P.C. building.

ii) Outline of the floor plan is as follows:

a. The building is three storied, facing the central yard.

b. First floor is for TV programme production and includes TV studios, rooms for settings, performers and production staffs as well as an entrance hall, second floor is for technical rooms of TV production and third floor is for radio production. The required rooms are divided into three categories and located on each floor respectively, in order to reasonably arrange and separate the circulation of the staff.

c. Workshop for set is separated from the main building to avoid transmission of noise and vibration generated by the work carried out.

iii) The drawings shown in Section 4-6 are the floor plans made with consideration to the conditions as described above.

On the first floor, rooms for performer and rooms for setting are located adjacently to the three TV studios, and the former are to the east and the latter are to the west of the studios, in consideration of traffic lines of the respective staffs. The entrance and rooms for production staff are located in the southern

part of the building.

On the second floor, control rooms of the TV studio are located adjacently to and east of the upper part of the TV studios, and technical apparatus room housing VTR, Tele-cine etc. is located close to the control rooms. Rooms for technical staff are located in the southern part of the building.

On the third floor, two large radio studios are located above the TV studios, and four small radio studios are located above the eastern part of the large TV studio. Control rooms of the radio studio are located adjacently to and east of the radio studio. Rooms for performers are located close to and east of the control rooms, in consideration of the traffic lines of the performer. Rooms for production staff are located at southern part of the building.

Air-conditioning equipment room is located closely to and west of the TV studios and large radio studios to minimize length of the air duct. Major air-conditioning equipment are gathered in the room for easy maintenance.

(3) Ceiling height of TV studio No.1 is approx. 9.5 m as the height of the "horizont" is to be 6 m and the height of the pipe grid is 7 m. Ceiling heights of TV studios No.1 and No.2 are approx. 6 m as the

"horizont" height is 4 m and the pipe grid height is 4.5 m. Ceiling heights of radio studios No.1 and No.2 are 3 m. The heights of the floors from slab to slab are to be approx. 4.25 m in consideration of the studio ceiling heights, ducting space for low speed air ducts and space for structural girders and beams.

ROOM AREA (Approx.)

Floor	Room Names	Area (m^2)	Description
1st	Studio TV No.1	240	Net Area 208.6 m^2
	Sound Lock	12	
	Camera Storage	34	
	Studio TV No.2	121	Net Area 98 m^2
	Sound Lock	10	
	Camera Storage	11	
	Studio TV No.3	121	Net Area 98 m^2
	Sound Lock	10	
	Camera Storage	11	
	Setting Storage	208	
	Setting Workshop	223	Separated Building
	Worker's Room	32	incl. Shower Room
	Entrance Hall	59	
	Reception	25	
	Lounge/Meeting Rm.	120	
	Rehearsal Room	95	
	Make-up/Dressing Rm.	53	
	Costume Storage	31	
	Washing/Shower Rm.	14	
	Service Room	8	
	Office	116	

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	Building Maintenance Rm.	22	
	Power Room	49	
	Pump Room	16	
	Storage	29	
	Staircase	39	
	Lavatory	32	
	Corridor etc.	221	
	Total	1962	
2nd Fl.	Control Rm of TV Studio No.1	63	
	TV Announce Studio	33	Net Area 26 m^2
	Dimmer Rack Room	33	
	Control Rm. of TV Studio No.2	63	
	Control Rm. of TV Studio No.3	63	
	Common Equipment Room	218	VTR, Tele-cine, Electronic Apparatus
	VTR Tape Storage	25	
	Maintenance Room	45	
	Office	152	
	AC Equipment Room	93	Air-Conditioning Equipment
	Staircase	39	
	Lavatory	20	
	Corridor Etc.	144	
	Total	991	

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3rd Fl.	Studio Radio No.1	65	Net Area 41.6 m^2
	Control Room	31	
	Sound Lock	10	
	Studio Radio No.2	65	Net Area 41.6 m^2
	Control Room	31	
	Sound Lock	10	
	Studio Radio No.3	15	Net Area 7 m^2
	Control Room	15	
	Studio Radio No.4	15	Net Area 7 m^2
	Control Room	15	
	Studio Radio No.5	15	Net Area 7 m^2
	Control Room	15	
	Studio Radio No.6	15	Net Area 7 m^2
	Control Room	15	
	Lounge/Meeting Rm.	89	
	Rehearsal Room	63	
	Editing Room	32	
	Office	178	
	Chief Engineer's Office	46	
	Advisor's Office	23	
	Conference Room	25	
	Tape Storage	33	
	Pantry	9	
	AC Equipment Room	323	
	Staircase	39	
	Lavatory	20	
	Corridor Etc.	210	
	Total	1422	
	Total	4375	

4-4-3 Acoustical Design

(1) Sound Control

Target value of air-conditioning noise are as follows;

Room Names	NC value
Radio Studio	20
TV Studio Control Room	25
Rehearsal Room Editing Room	30
Make-up Room Lounge/Meeting Rm. Technical Apparatus Rm. Office	35

Noise which enters into the studio from the outside shall be controlled, taking into account the masking effect from the air-conditioning noise, to a level not practically interfering with the recording of sound.
Where required to insulate noise from aircraft or adjoining studios, double wall of reinforced concrete and/or masonry shall be installed.
Floating structure shall preferably be employed for the radio studios against structure-borne noise caused by walking.
Sound-proof doors and sound-proof windows shall be installed in the studios.

(2) Room Acoustics

In the radio studio, dimentional ratio of the studio length, width and ceiling height shall be of a value

within the recommendable range. Target value of average sound absorptive rate shall be 0.35 to 0.45 at 500 Hz, in order to gain recommendable reverberation.

In the TV studio, about half of the inside wall surface is to be covered by a fixed "forizont" which is required of a TV studio.

Tentative approximate dimensions of the studio, which are to be further studied at detail designing, are shown on below table;

Dimensions	Length (m)	Width (m)	Height (m)	Floor Area (m^2)	Total Surface Area S(m^2)
Radio Studio No.1, No.2	7.3	5.7	3.3	41.6	169
Radio Studio No.3 to No.6	3.5	2.0	2.3	7.0	39
TV Studio No.1	17.1	12.3	9.0	208.6	948
TV Announce Studio	6.5	4.0	2.7	26.0	108
TV Studio No.2, No.3	8.1	12.3	6.5	98.0	463

Dimensions	Volume V(m^3)	V/S (m)	Reverberation Time at 500 Hz (sec.)
Radio Studio No.1, No.2	137	0.81	0.21 - 0.31
Radio Studio No.3 to No.6	16	0.41	0.11 - 0.16
TV Studio No.1	1883	1.99	0.53 - 0.74
TV Announce Studio	70	0.65	0.17 - 0.25
TV Studio No.2, No.3	640	1.38	0.37 - 0.52

(3) Acoustical condition shall be taken into consideration in designing of the control rooms and rehearsal rooms. Sound absorptive material shall be employed for inside finish of the air-conditioning equipment rooms to control noise level of the rooms.

4-4-4 Structural

(1) Design Standard

The Standards to be used for structural design and calculations shall be basically that of the Japanese Architectural Law and Code and various standards set by the Japan Architectural Institution. However structural and architectural standards established in Thailand shall also be refered to at time of structural design and calculations. The superimposed load for calculation of non-technical rooms shall be based on the figures that are given in the above standards. For the studios, control rooms, VTR/Tele-Cine Room and other technical rooms the superimposed loads shall be determined from those that are commonly used for structural design, calculation and evaluation at NHK (Japan Broadcasting Corporation). Seismic forces shall not be considered in the structural design.

(2) Structural Design

The building shall be rigid frame reinforced concrete structure. The roof of the main TV studio and the workshop shall be spanned with steel structural members.

The workshop shall be an independent structure in consideration of noise and vibration.

The structural elements such as the columns, beams and walls shall be, as far as the form dictated by the plan allows, of uniform alignment and well balanced.

(3) Foundation Structure

The foundation structure planned shall be of reinforced concrete.

From evaluation of the results of the subsoil investigation carried out for the S.T.O.U. complex, it is planned to support the Building with reinforced concrete piles. The pile head shall be embedded in a sand layer with an N value of over 50, which is located 22 meters beneath the ground surface. Load bearing test of the pile shall be carried out at time of construction in order to confirm the allowable load bearing capacity of the pile.

(4) Outline of the Building Structure

a) The main building shall be a 3 storied building of reinforced concrete. The roof of the Studio TV-1 shall be spanned by steel beams. The walls of the studio shall be of reinforced concrete and/or masonry and, where sound attenuation qualities are required, dual layer of wall shall be employed. The first floor shall be raised from the surrounding ground level and shall be a structural slab of reinforced concrete.

b) The workshop shall be of reinforced concrete structure with steel roof girder.

4-4-5 Air-conditioning and Ventilation

(1) Design shall be based on ambient conditions of the rooms as practiced in Japan and meeting the requirements of the respective rooms and programme production equipment, due to nonexistence of such specific codified conditions in Thailand.

(2) The studios, control rooms and tape storage shall be air-conditioned by means of a central system air-conditioning unit with cooling tower and duct system. The system shall reasonably be divided so that the system can be partially turned on and/or off according to the situations of the respective rooms to save an operating cost. The construction cost of the divided system must be higher than that of an integrated system. However, savings can be expected on operating cost and furthermore, the equipment can easily be replaced if so required in the future.

(3) Both supply and return air-duct system shall be installed for the central system described in 2. above. Where criteria of noise level is severely determined, such as the studios and control rooms, the duct system shall be designed with the utmost care for prevention of noise and vibration.

(4) No air-conditioning system is installed for the other rooms than above. If installed, split condenser unit type, without duct, is recommendable. This system may be turned on and/or off one by one to minimize operating cost and can be maintained easily as the system is widely used in Thailand.

(5) Mechanical ventilation system shall be installed for lavatories, storages for general use and building equipment rooms but not installed for rooms for setting, corridor and staircase.

(6) No heating system shall be installed.

4-4-6 Plumbing and Sanitary

(1) The design shall be carried out in accordance with common practice in Japan, since no particular stipulation is provided in the Bye-laws of the Metropolis.

(2) In the plan for S.T.O.U. Headquarters as no city water facility is available at the site, the water supply system consisting of the borehole, the well pump, the reservoir tank, the booster pump and the main line of water distribution system in the site are to be provided by S.T.O.U., and the receiving tank, the lift pump and the elevated tank are to be installed in each building. Construction work from the borehole to the main line has been nearly completed except installation of the pumps.

As per the said plan, the receiving tank which receive the water from the main line and the subsequent facilities from the tank shall be included in the scope of the E.B.P.C. building.

(3) The well water from the said borehole can be used for general use and as cooling water without peculiar treatment, as the Results of Chemical Analysis of the water shows that the quality of the water is good and meets the drinking water standard. The well water, however, shall not be used for drinking as the water is not treated as drinking water, and the bottled water, which is on the market as drinking water, shall be used for drinking. No distribution pipe system shall be provided for the bottled water. This is common in Bangkok.

(4) Lavatories for men and for women shall separately be provided as many female employees and performers will be housed. The design for toilet facilities viz. sanitary wares, cosmetic shelves, mirrors etc., shall be as those common in Japan. The closets shall be of Thai type.

(5) Wash basins, toilet tables, mirrors and shower sets shall be installed in the make-up room for performers. Hot water supply system shall not be installed.

(6) A kitchen sink shall be installed in the pantry. No hot water supply system shall be installed.

(7) In the plan for S.T.O.U. Headquarters as no city drainage system is available, the septic tank and cesspool (soakway) is to be installed for each major building to dispose of waste water and sewage. This is common in the suburban areas of Bangkok.
As per the said plan, the construction of septic tank and the cesspool shall be included in E.B.P.C. project. In the E.B.P.C. building, the drainage and the vent system shall separately be installed for waste water and sewage respectively, which shall join at the outdoor manhole and flow into septic tank.

(8) In the plan for S.T.O.U. Headquarters, storm water is to be disposed into the pond through the main lines of the storm sewer. When the water level of the pond ascends due to heavy rain, the water of the pond is to be pumped up and disposed to public storm sewer line installed along the public road. The bund, having a height exceeding the level of public road, is to be constructed around the site, to prevent inflow of the water from outside of the site in the event of flood during the rainy season. The pond, the main lines and the bund have been completed except installation of the pump.

As per the said plan, in the design for E.B.P.C., storm water shall be disposed into existing main line.

(9) The hydrant with fire hose and nozzle shall be installed at each floor. Water source shall be the elevated tank and the booster pump shall be installed.

(10) Fire extinguishers having proper peculiarities necessary for the extinguishing purpose of the respective rooms shall be installed for the corridors, studios, setting rooms etc. No automatic fire extinguishing system shall be installed.

4-4-7 Electrical Installations

(1) No stipulation concerning electrical installations including fire alarms is provided in the Bye-laws of Bangkok Metropolis. The Notification of the Ministry of Interior, Re: Safety in connection with Electricity is in force on electrical installations, wiring in a building, lightning arresters and electrical works. It is considered, however, that the design carried out in conformity with BS shall meet the stipulations of the Notification.

(2) Power source of 50 Hz, 3 phases, 3 wires, 12 kilovolts (KV), supplied by the Metropolitan Electricity Authority (MEA) is available on the the public road in front of the site. In the plan for S.T.O.U. Headquarters, the

12 KV power is to be introduced into the site and distributed to each major building through the overhead wires supported by the precast concrete poles.

The power is to be transformed to 3 phases 4 wires 380/220 volts by the four transformers to be installed in each major building. This method shall also be employed in the design for E.B.P.C. because the method is reasonable, economical and common practice, and also because the overhead wiring on the site has been complete Existing overhead trunk line will be partially modified and connected by S.T.O.U. to the main breaker to be installed in E.B.P.C.

The transformers to be installed in E.B.P.C. shall be of indoor type as per design for Headquarters.

(3) The main distribution board shall have terminals of power source for the following;

a) Programme production equipment (with automatic voltage regulator)

b) Studio lightings

c) General use (general lighting, socket outlet etc.)

d) Motors of building equipment

(4) Lighting fixtures shall mainly be of fluorescent lamp type in consideration of economy of power consumption and durability,and arranged to achieve average illumination of400 lx. for the offices, the meeting

rooms, the rehearsal rooms, the control rooms, the technical apparatus room, the maintenance room, the make-up room and the radio studios, 200 lx. for the setting storage, the workshop, the tape storages and the video tape storage, the camera storages and the building equipment room, and 100 lx. for the TV studios, the corridors, the staircases, the lavatories, the costume storage and the storages for general use.

Emergency lighting fixtures for safety at the time of power failure shall be of battery built-in type and arranged to achieve illumination of approx.10 lx. on the floor level of strategic points of evacuation.

(5) The socket outlets shall be provided in each room for general use, and in proper points for cleaners, water-coolers, water-heaters, time-recorders, copy machines etc.

(6) Though no stipulation concerned is provided in the regulations, such automatic fire alarm system as differential acting spot type heat detector shall preferably be installed in potentially dangerous rooms such as in which a lot of combustible materials may be accumulated, and manual push button shall be installed in the corridor on the each floor. The alarm bells shall be installed in the corridor on the each floor, and receiving panel shall be installed in the room at which personnel are always in attendance.

(7) The conduit pipes and wires, the main terminal box and the outlet terminal boxes shall be installed so that the telephone sets can be set as required. Introduction of public telephoen lines, installation of private exchange equipment and trunk lines in the site and connection into the main terminal box of E.B.P.C. will be carried out by S.T.O.U.

(8) Lightning arrester system shall be installed in conformity with the Notification of the Ministry of Interior.

(9) The earthing systems shall be installed in conformity with the Notification. The earthing system for broadcasting equipment shall be separately installed from that for general electrical equipment.

4-4-8 Construction Materials and Methods

It is planned to use as much locally produced construction materials as possible, since most of construction materials are available locally and it would make maintenance relatively easy if the materials to be replaced can be obtained on the domestic market. However, when materials, to be used in the studios, requiring certain specific physical characteristics or properties, cannot be found or prove to be of uncertain quality, such materials shall be brought from Japan. The aforementioned holds basically true for construction methods.

(1) Main Structural Elements

For cement and steel reinforcing bars there are TIS standarized products on the domestic market. As the standards for cement are based on ASTM and BS and the steel bars are based on JIS, there should be no problem to its compatibility with the structural design. Piles of various sectional configurations are manufactured domestically and judging from the soil condition of the proposed site it should be possible to select one from the above to fulfil the planned purposes.

The long span beams for Studio TV-1 is planned to be of steel structure. Domestic materials shall be used, if possible, but this decision must wait the results of the detailed structional analysis and calculations.

(2) Walls

Since walls of cast-in-site reinforced concrete is not a common construction method in Thailand and bearing in mind that, due to negligibility of seismic forces, it is not necessary to consider a wall to bear horizontal stress, the walls shall be of masonry construction.

However, for the E.B.P.C. building, especially around the studios and control rooms, some of the walls shall be required to have sound isolating qualities. The

specific value of isolation required of walls shall be determined by acoustic analysis.

As it is not usual, in common construction practice, to specify such isolation values quantitatively, it will be necessary to specify the isolation and required construction methods in as much detail as possible in the Specification.

(3) Roof

Considering the amount of solar radiation accumulated and the necessity for waterproofing, it would be best to allow for as much air space as possible over the structural roof slab by covering it with asbestos slate sheets. The sheets and thus installation methods are widely available in Thailand.

(4) Interior Finishes

Non technical rooms shall have in principle regular finishes using locally manufactured materials, but for areas where the internal traffic may become causes of undue noise, laying of carpets or other cushioning materials, shall be considered.

In rooms such as the Workshop or the Air-conditioning Rooms where generation of loud noises is expected, the noise shall be suppressed by applying sound absorbing materials to the walls and ceiling. For the Studios and Control Rooms, where a controlled acoustic environment is necessary, various sound

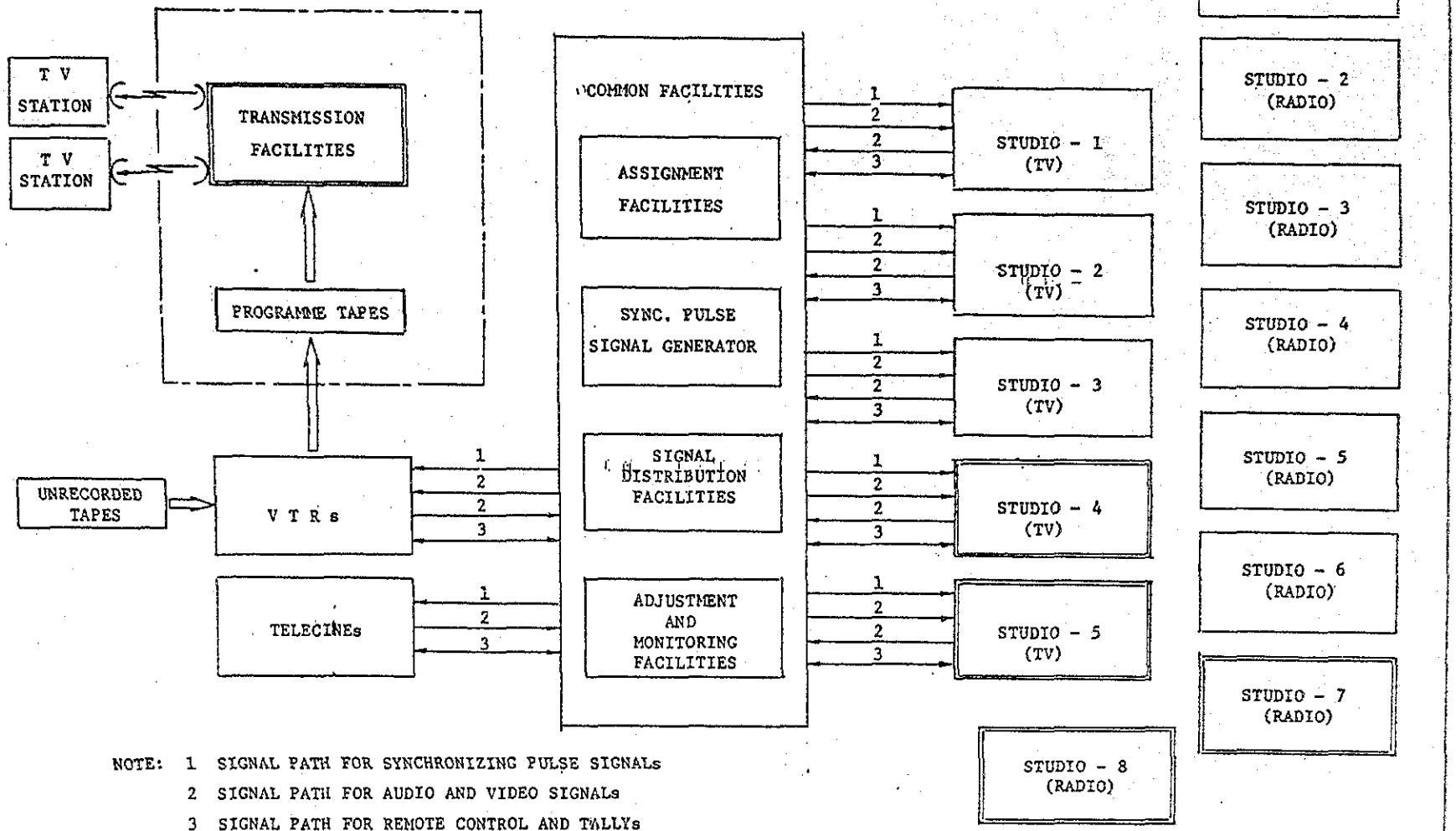
insulative and absorptive materials must be applied. These shall be, to the extent allowable, of local manufacture but may be brought from Japan if their acoustical quality can not be proved.

(5) Miscellaneous

Most of the doors glazing and frames shall be of domestic manufacture or fabrication but for the sound proof doors and studio observation windows and their hardwares, in respect of performance, durability and reliability, Japanese products might prove the better choice. Air-conditioning equipments shall be considered for their noise generating characteristics and if proved to be within allowable limits those of local manufacture shall be employed. Other materials or equipment for building equipment use shall be of local manufacture.

However, acoustical quality of materials of air-duct shall be confirmed as acoustic calculation is required to design the air-duct.

4-5 System Diagram of Programme Production Facilities



NOTE: 1 SIGNAL PATH FOR SYNCHRONIZING PULSE SIGNALs
2 SIGNAL PATH FOR AUDIO AND VIDEO SIGNALs
3 SIGNAL PATH FOR REMOTE CONTROL AND TALLYs
FUTURE PLAN

E B P C STOU	
SYSTEM DIAGRAM OF EDUCATIONAL BROADCASTING PROGRAMME PRODUCTION CENTRE	MARCH, 1982