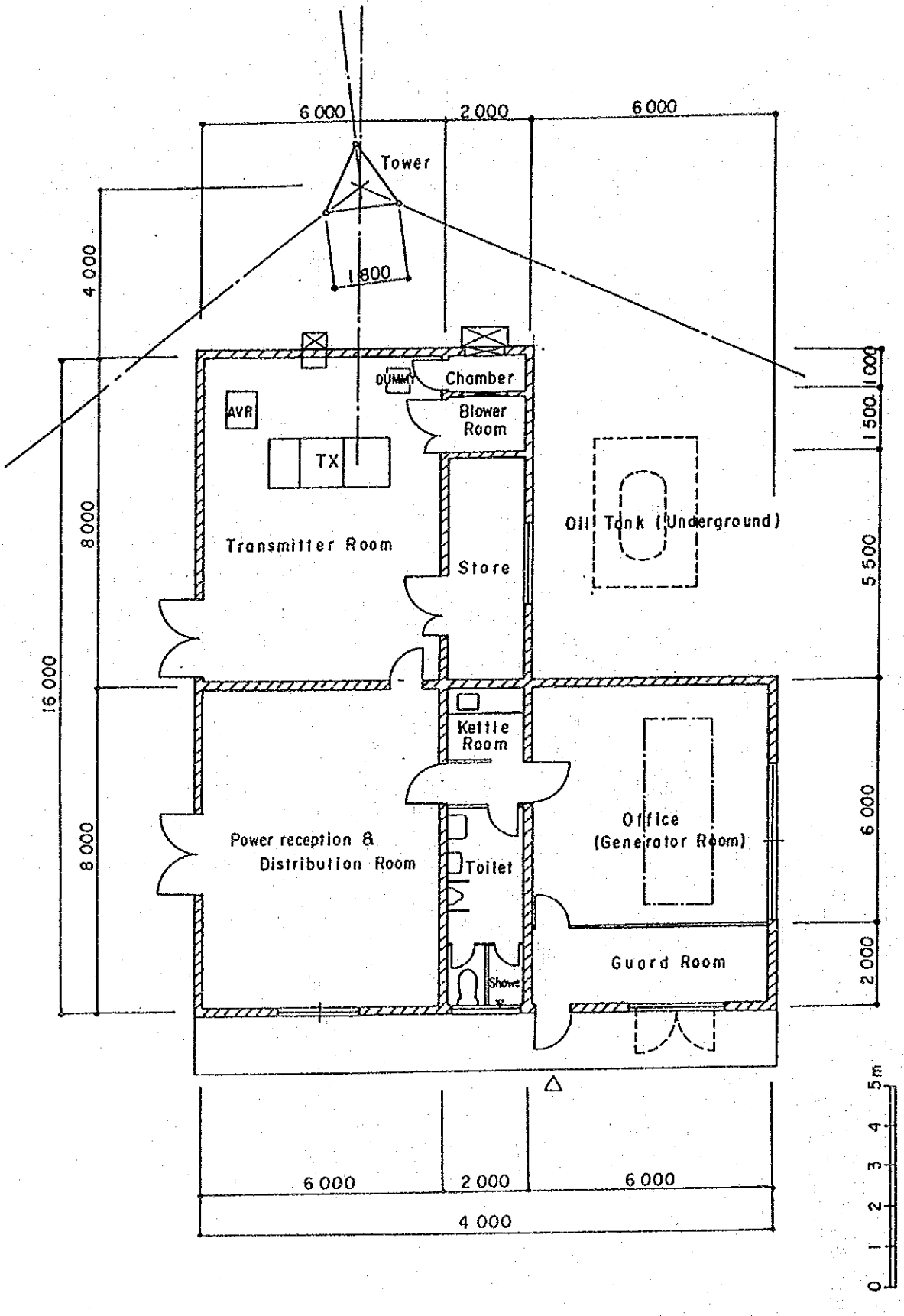
Figure 3.3.2 Floor Plan of Encarnacion Transmitting Station



(c) Antenna Tower

Since the existing antenna tower (113m high) has no margin of strength, guy wire type towers should be newly constructed. However, it should be constructed on the same site, and it is essential that the antenna towers should be built higher than existing tower so as to avoid the interference to the TV antenna pattern. The tower should be 116m high, and the width of one side of tower is 1.2m.

(d) TV Transmitter and Transmitting Antenna

The transmitter output is 10 kW (CH-18). The antenna gain in the maximum radiation direction is 9.6 dB, the ERP is 90 kW. The feeder uses 77D. Since the transmission target area. Encarnacion, is near the Argentine border, in order not to cause any TV frequency interference, a maximum radiated power to the direction of Argentine should be reducted by 5 dB. UHF transmitting antenna 3 stage 4D antenna for 3 faces and one stage, 4D antenna for 1 face,will be installed. Furthermore, a color system converter is insented at the input of transmitter.

(e) Electric Power Facilities

Since high tension reception (13 kV) electric power with single-phase line are currently used for the ANTELCO relay station, it should be converted to three phase-lines in consideration of power capacity, power transmission loss, and improvement of voltage variation. Since it would be possible to use existing electric poles all that would be required simply adding the single high voltage lines. A 100 kVA high tension transformer shall be installed. This construction would be the responsibility of ANDE (electric power company). Furthermore, an AVR should be installed to stabilize the voltage.

(f) Emergency Generator

It was decided not to install emergency generator since here is a branch station with no studio facilities.

(g) Individual Air Conditioning Equipment

In order to lower the temperature in the transmitter room below 25 degrees when the outside temperature is 40 degrees in the summer time, a single unit packaged style 26,000 kcal air conditioner should be installed.

3.4 Villarrica Station

(a) Transmitting Station Site

A site on Mount Cerro Naville (Altitude 291m) was selected in order to serve a wider area, geographically situated at the center of the eastern part in Paraguay. This is a small mountain about 850m from a national road. The top of the mountain is covered with large rocks, and the flat area is rather limited. Furthermore, there are a large number of tall trees, so that leveling of ground and removing the trees should be required. In addition, because the mountain has largely rock, consideration must be given to securing a low earth resistance for the lightning rod and broadcasting equipment. From the foot of the mountain, there is approximately a 120m difference in height. (See Figure 3.4.1)

(b) Station Building

Station building having 16m × 8m space shall be constructed below the antenna tower to make the antenna feeder length as short as possible as shown in Figure 3.3.2.9. Furthermore, rain water tanks to keep rain water should be installed at the top of the station building for ordinary-use water. Drainage water should be penetrated into underground. The layout and floor plan is shown in Figure 3.4.2~3.

Transmitter room	48 m^2
Office	40 m^2
Maintenance room	27.5 m^2
Restrooms, hot water heaters	7.5 m^2
Blower room	5.0 m^2
Total	128 m^2

Figure 3.4.1 Arrangement Plan of Villarrica Transmitting Station.

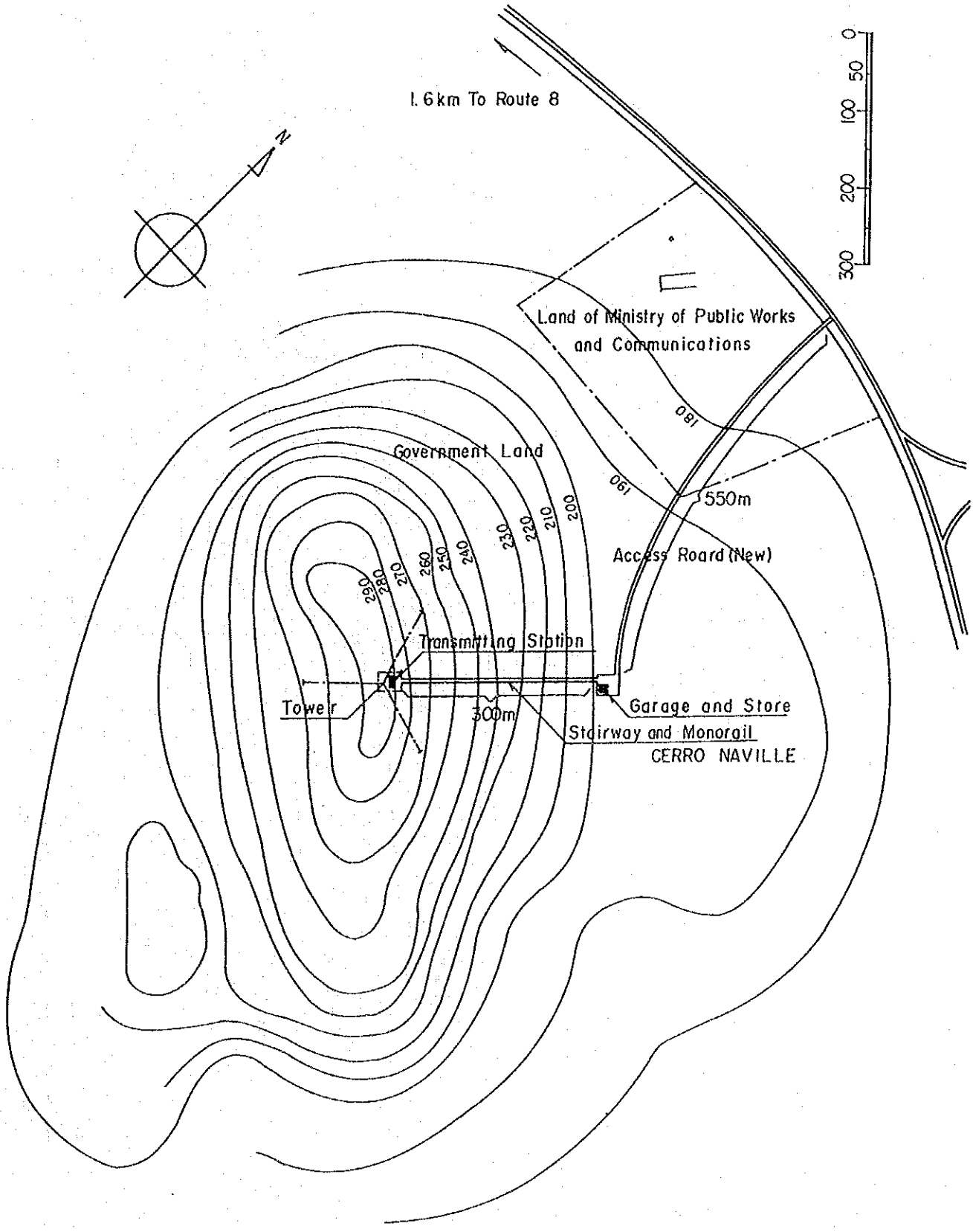


Figure 3.4.2 Layout Plan of Broadcasting Station in Villarrica.

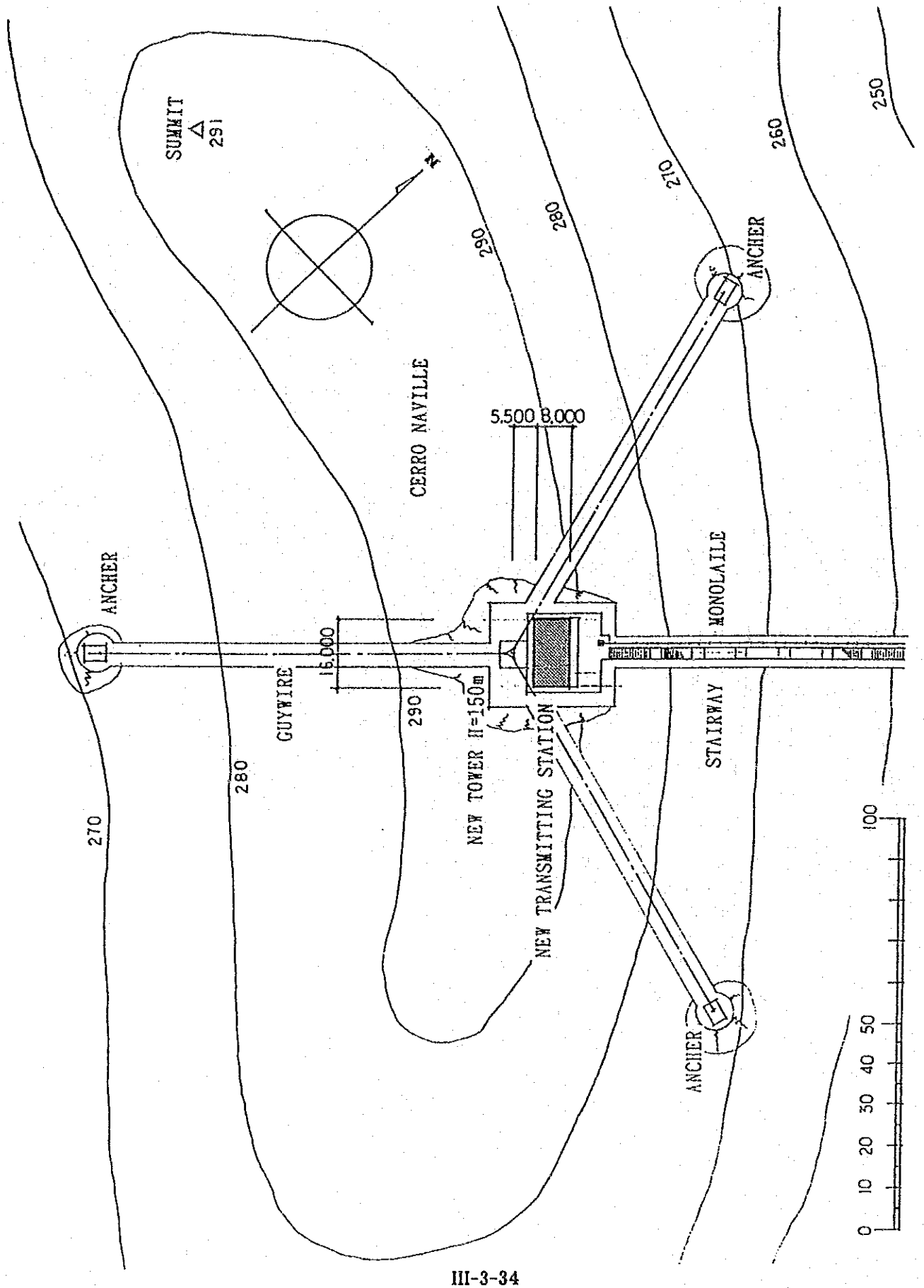
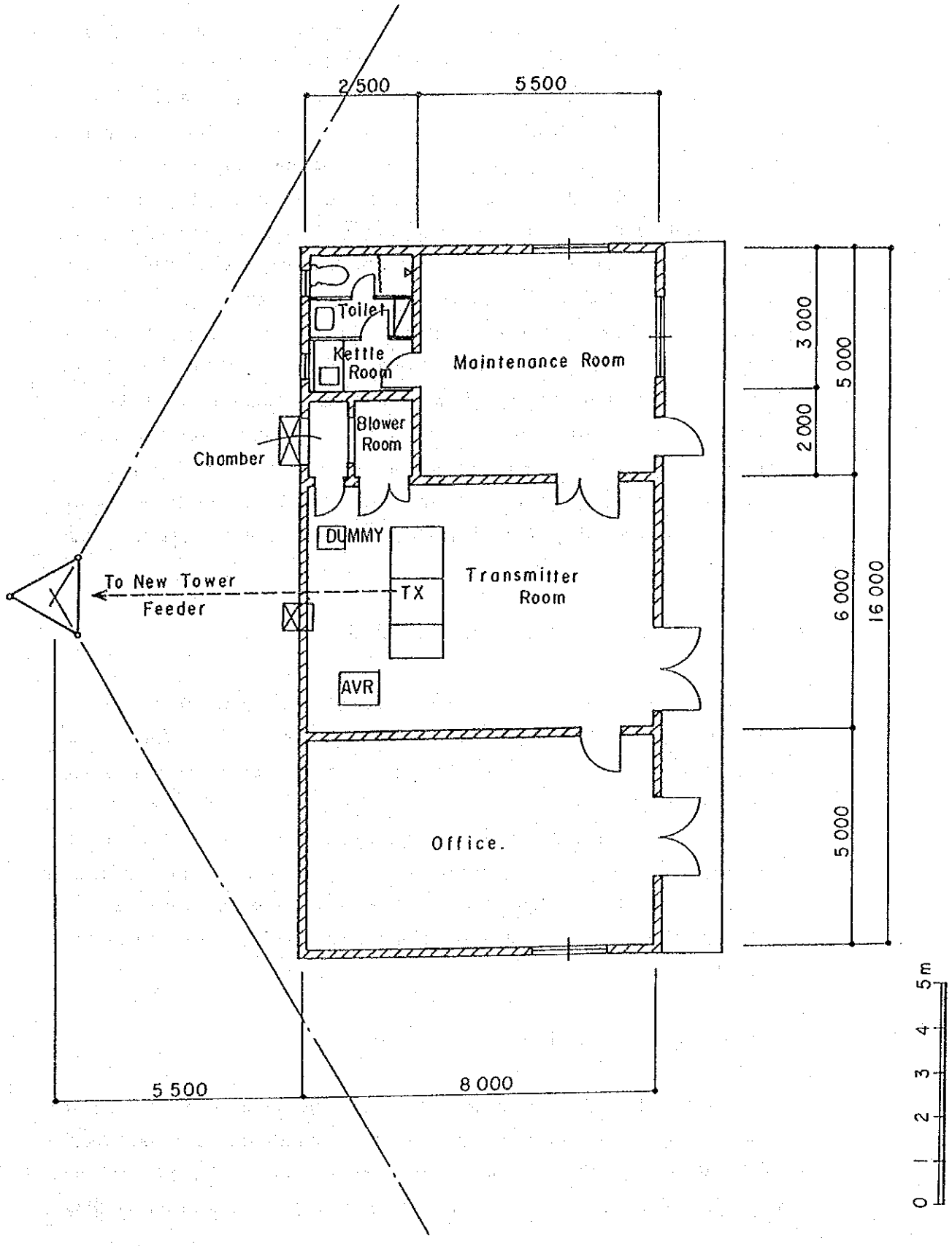


Figure 3.4.3 Floor Plan of Villarrica Transmitting Station



(c) Antenna Tower

The antenna tower should adopt guy wire type with triangular trusses. Height of antenna tower was determined 150m high so as to cover populous cities of Caaguazu, Caazapa, Dr. J.M. Frutos, and Juan E. Estigarribia. Furthermore, since the broadcast channel will be channel 2, the transmission antenna will be very large measuring about 4.2m × 22.8m, as a result, the width of the side of the antenna tower must be made 1.8m or more. Moreover, the guy wires just under the antenna group, must be installed with 2 wires in order to prevent the tower to twist. The tower's base and anchor section will require a distance of 123m. Since there is approximately a 20m difference in altitude between both point, about 1/10 of the antenna tower height, that is to say, 15m is needed by leveling of ground. For access to the top of the mountain, a vehicle road (width of 4m, gravel) will be constructed from the land of the Public works Ministry, along side of the highway, to the foot of the mountain. At this point, a simple warehouse will be built. From this point to the transmission station, a footpath and a monorail track for carrying heavy materials must be constructed.

(d) TV Transmitter and Transmitting Antenna

In order to secure a wide service area, the transmitter shall have an output power of 10 kW (CH-2), with maximum antenna gain of 7.8 dB, and ERP of 60 kW. The feeder uses 77D. Near this transmission site locate the tallest mountain in Paraguay, i.e. Mount Ybytruzu (altitude of 850m). As the population is small to this direction, the radiation power is set at -3 dB compared with the maximum radiated power. The antenna configuration shall be 4 stages of 2 Dipole for 3 faces and 2 stages of 2 Dipole. Furthermore, a color system converter shall be installed at the transmitter input.

(e) Electric Power Facilities

A 100 kVA high tension transformer should be installed on the top of the mountain, and high tension line of 850m in length should be laid from the 23 kV main line along side the national road to the top of the mountain. Furthermore, an AVR must be installed in the station building

to stabilize the incoming power voltage. A telephone line can be extended from the side of the highway to assure convenience of maintenance.

(f) Emergency Generator

It was decided not to install emergency generator since this is a branch station with no studio facilities.

(g) Individual Air Conditioning Equipment

In order to lower the temperature in the transmitter room below 25 degrees when the outside temperature is 40 degrees in the summer time, a single unit packaged style 26,000 kcal air conditioner will be installed.

3.5 Program Transmission Plan

(1) Program Transmission Between ETV Center and ANTELCO Central II.

1) Experimental Phase

In this period, program production and the master control room operation are conducted in MEC's (Don Bosco) provisional ETV center. The transmission to the TV transmitter at ISE site shall be done as bellow.

1st link. MEC to SNT (CH-9) station by FPU.

2nd link. SNT to ANTELCO Central II by STL utilizing existing parabolic antenna of SNT, which is now being used for SNT between ANTELCO Central II.

3rd link. ANTELCO Central II to Transmitter at ISE. by newly installed STL (Mini Micro) which can be continuously used in Full-scale phase for the purpose of receiving international programs.

Figure 3.5.1 shows the transmission system between MEC, SNT (CH-9) and ANTELCO Central II.

During the experimental broadcasting, the two STL (Mini Micro) transmitters and one receiver will be installed temporarily in a machine room at ANTELCO Central II, and one set of transmitter and receiver of 8TL (Mini Micro) will be installed temporarily in a machine room at SNT (CH-9). In addition, one set of FPU transmitter and receiver will be installed temporarily on the roof of SNT (CH-9), and one set of transmitter and receiver in a room adjacent to the MEC studio sub-control room of MEC.

These pieces of equipment used during the experimental broadcasting will be relocated to respective predetermined locations just before the full-scale broadcasting begins.

MEC (Don Bosco) is located in a low land near Paraguay River south-west to Asuncion City. The directions for the transmitter station (ISE) and ANTELCO Central II are passing through the center of the city where high-rise buildings stand together in large numbers and no line of sight is available. An investigation on views from a nearby building revealed that the land height rises toward the center of the city with many buildings obstructing the views. Judging making a detour route as a reasonable solution, a plan to go through SNT (CH-9) was adopted as an efficient and inexpensive method.

2) Full Scale Phase

Installation of STLs composed of

1. For transmission to regional stations
2. For transmission of out-going international line
3. For receiving of either international or domestic in coming signals

In ANTELCO Central II, the following equipment shall be installed.

One set of STL transmitter.

Two sets of STL receivers.

One parabolic antenna shall be mounted on the existing self-supporting tower.

(2) Program Transmission between Asuncion, Encarnacion, Giudad del Este and Villarrica

At present (April 1993), this digital circuit (140 Mb/s) is being used by a private production company in 140 Mb/s coded signal, but ANTELCO has an intention to adopt the world standard codec (34 Mb/s/45 Mb/s) regulated by CCITT. By adoption of this codec signal, it is possible to transmit the new educational programs by using this 140 Mb/s digital circuit and/or the spare circuit, together with other commercial TV station's signals and telephone signals in a form of multiple coded digital signals.

1) Encarnacion (Cap. Miranda)

Encarnacion area is covered by Cap. Miranda ETV station which is co-sited with a node transmission station of ANTELCO of the above 140 Mb/s digital circuit. Therefore, by the adoption of the 34 Mb/s or 45Mb/s, the ETV programs can be obtained here.

2) Ciudad del Este

Similar to the Encarnacion (Cap. Miranda), this station can get ETV programs from the digital circuit of ANTELCO.

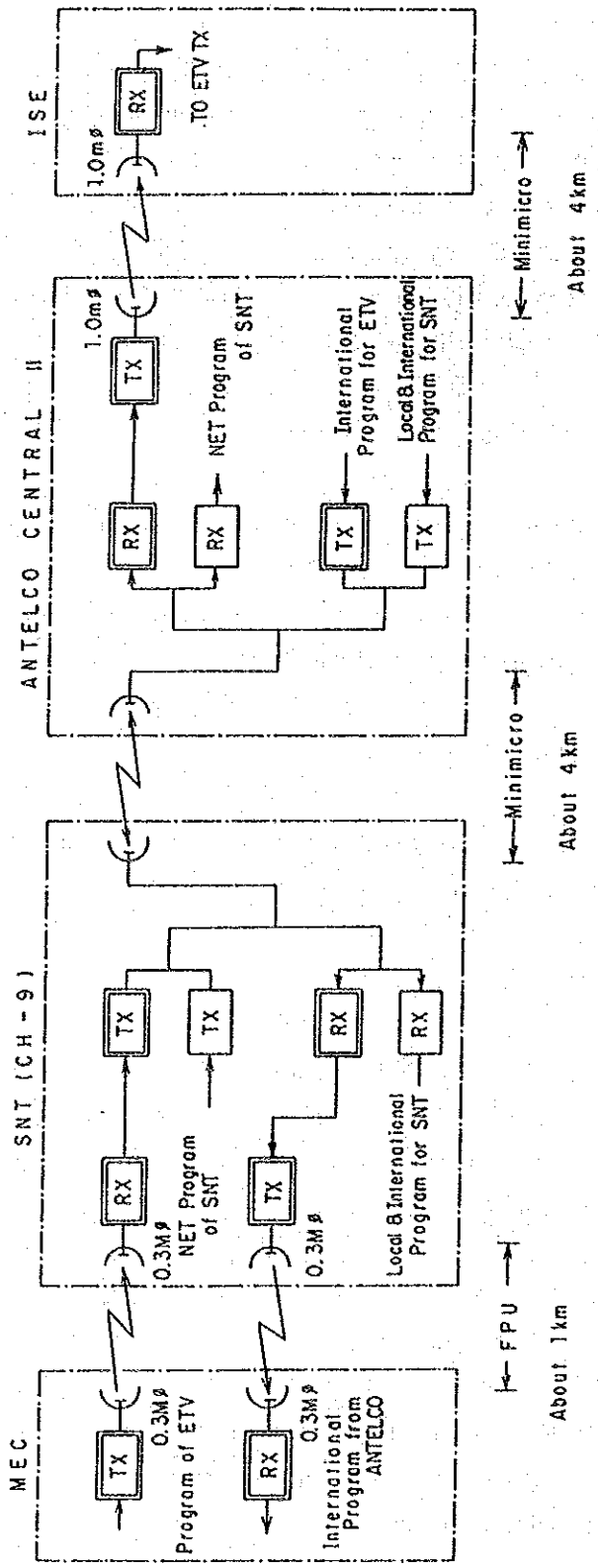
3) Villarrica

Since the ETV station scheduled to be constructed at Cerro Naville is apart from ANTELCO micro-wave relay station, the ETV programs shall be transmitted from near ANTELCO's Cnel. Oviedo station by a STL (Mini Micro) to this ETV station.

The Cnel. Oviedo relay station of ANTELCO is a node station of the 140 Mb/s digital circuit.

The STL (Mini Micro)'s transmitter shall be installed at Cnel. Oviedo station, and the parabolic antenna shall be attached to the existing tower of Cnel Oviedo station.

Figure 3.5.1 Circuit Diagram of Program Transmission for Introduction Plan.



CHAPTER 4 ORGANIZATION AND MANAGEMENT PLANS

4.1 Management Plan

4.1.1 General

The entity undertaking the educational TV broadcasting services planned is of a public corporation as proposed in the Master Plan Study, however, as a sufficient revenue cannot be foreseen to cover its expenditure by the end of the period of the Priority Project, an organization planned herein is recommendable to be an autonomous de-centralized government entity financially supported substantially by the National Account of the Government taking account of both scarce financial and man power resources commensurate to the required jobs as well as a necessity of having flexibility of financial management which is indispensable to operate TV broadcasting service effectively. An example of an autonomous de-centralized government entity in the education sector in Paraguay is the National University of Asuneion. As the major activities of the entity is of an educational TV program which forms a part of public education, an income generated by commercial TV advertisement is substantially restricted, therefore, it will need a considerable period until the magnitude of income reaches to meet a total expenditure of the entity.

In order to suffice a stability of the operation of the entity based on the government budget which is not sufficient in general, the number of public financial sources of the entity is planned not to be single but to double or triple i.e. the MEC, the ANTELCO and/or the MOPC, all concerns to education and/or broadcasting technology from different aspects. It is planned also that the entity is entitled to obtain a revenue by selling TV program space to various ministries, public corporations, private interests and others under a certain limitation in consideration of influence on education so as to minimize financial burden of the government as much as possible.

From the educational point of view, this entity is to be mandated to provide various effective educational TV programs to supplement school education and to serve as an important educational tools aiming at an improvement of quality of education in general as described in the previous chapter.

An incorporation of educational TV program into a conventional education system is, therefore, to be considered as the most important element to assure the success of the Priority Project. However, none of such system have existed in Paraguay until today except a trial production of educational TV program on spot basis and distance education using radio network in the past, because of non existence of government own or operating TV station unlike other South American countries.

From above point of views, an institutional development of both an administrative system to supervise and to control an education system utilizing TV programs in a conventional education system, and the entity itself which undertakes preparation and broadcasting of educational TV program, is planned to be proceeded simultaneously in accordance with synchronized and harmonized implementation schedule as proposed herein.

The programmed activities for institutional development are described in subsequent section in details.

4.1.2 Phased Management Program

As mentioned in the previous section, both the system development of the educational system utilizing TV programs and the institutional development of the organization and the management of the entity which undertakes the educational TV broadcasting services, are planned to be developed phase-by-phase basis in accordance with the proceed of the development of the Project so as to incorporate educational TV program into conventional education system gradually and definitely without excessive confusion and failure thereof.

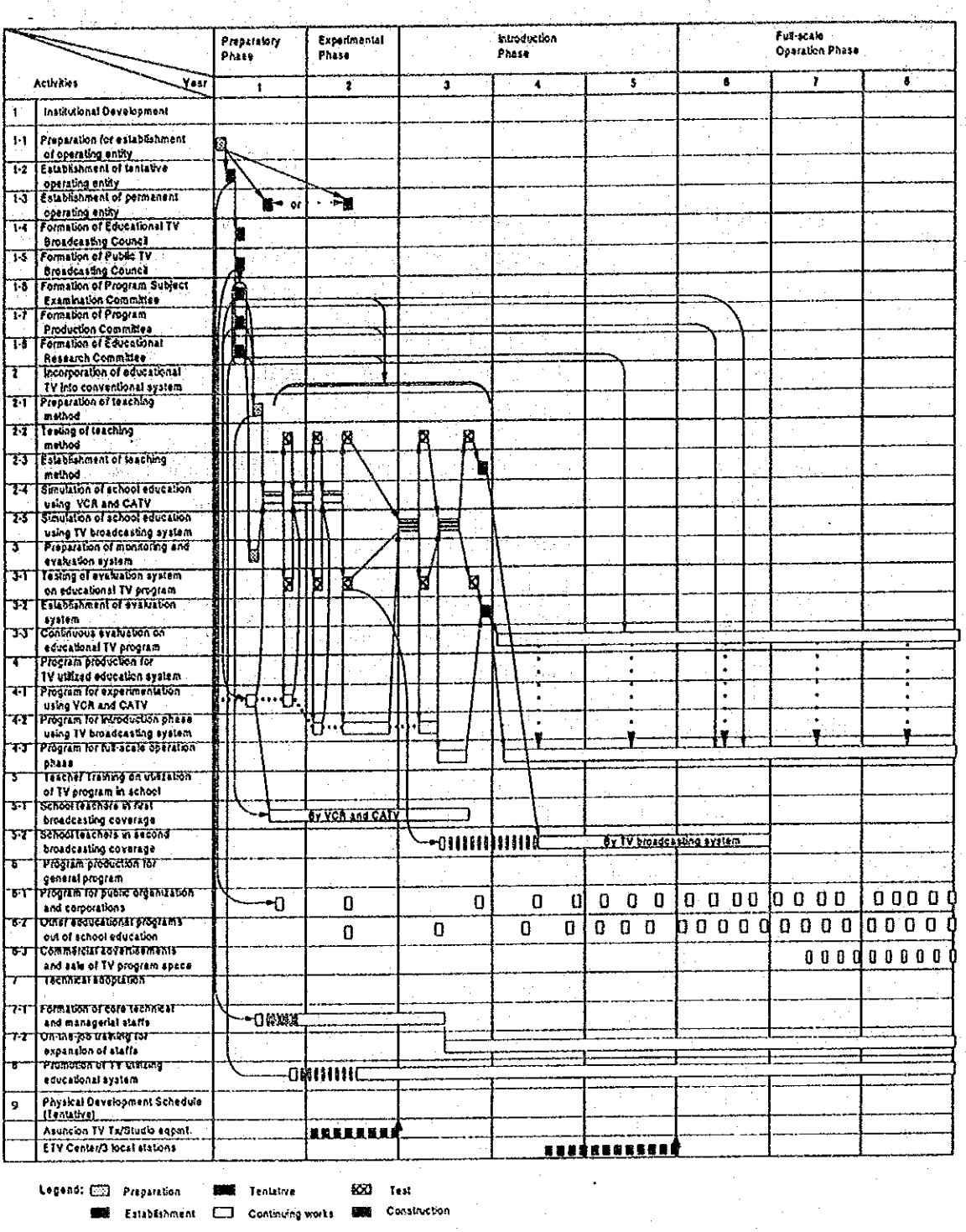
The phased development scheme planned for the time span determined for this feasibility study is divided briefly in 4 operation phases as follows:

1. Preparatory Phase
2. Experimental Phase
3. Introduction Phase
4. Full-scale Operation Phase

Figure 4.1.2.1 "Schematic Diagram of Phased Development" below illustrates an inter-relationship and a scheduled activities throughout the period of the Priority Project. As indicated therein, the nodes of these phases are as follow:

Phase	Node
1. Preparatory Phase	Completion of program production for experimental TV broadcasting services based on both preliminary teaching method and evaluation system prepared by the entity under the supervision of relevant committees and coucils.
2. Experimental Phase	Completion of TV transmitter and its antenna and starting of TV broadcasting service on experimental basis.
3. Introduction Phase	Establishment of teaching method, evaluation, and monitoring system. Accumulation of tested and evaluated educational TV programs.
4. Full-scale Phase	TV program time frame is filled completely.

Figure 4.1.2.1 Schematic Diagram of Phased Development



4.1.3 Management Program by Phase

Various activities required to build-up organization and to establish an educational system to incorporate educational TV broadcasting services into a conventional education system are programmed to be synchronized with skill development to prepare and provide appropriate educational and other programs. Followings are the descriptions of these programs planned herein.

Contents of major activities in respective phases are outlined below:

(1) Preparatory Phase

This preparatory phase is a quite important and indispensable period to form a concrete basis of institutional development and to realize a smooth implementation of the Project on long term basis as programmed herein.

This period is essential to arrange not only an operation entity but also an incorporation of educational TV broadcasting programs into a conventional school education system.

During this phase, a focal point of activity is to organize the entity, the councils and the committees mentioned below as a starting stage of an institutional development. Most of the human resource input during this phase is to be from the MEC. In such a way, the operating expenditure for this phase is to be kept as minimum as possible.

At the beginning of this phase, a tentative organization for the preparation of establishment of the entity as planned ; and said councils and committees of which details is described later part of this chapter will undertake the proceeds of below mentioned activities.

The major objectives of the activities scheduled during this phase are:

(a) to establish a concrete organization for operation of national educational TV broadcasting service;

(b) to form a number of councils and committees to supervise and administer the operation and management of the entity being created;

(c) to prepare a system to incorporate the educational TV programs into a conventional education system;

(d) to produce educational programs for broadcasting on experiment basis;

(e) to produce programs for the government public advertisement and information planned to be broadcast by the entity; and

(f) to promote utilization of educational TV broadcasting to a number of schools under the broadcasting coverage.

The contents of activities scheduled to realize above objectives are described below:

1) Establishment of a concrete operating entity for the national TV broadcasting services.

The operating entity shall be formally legalized and established through an authorization process of parliament and an approval of the President to be as an autonomous de-centralized government entity to undertake national education TV broadcasting services through an amalgamation of a part of the MEC and the MOPC. The part of these two ministries identified are Teleducation Department of the MEC and the ANTELCO which is under the administrative supervision of the MOPC. The details of organizational structures is to be referred to the succeeding chapter.

Until such entity is formally established a tentative operating organization is planned to be formed. This tentative organization will be an organization authorized by each ministries at ministrial decree of respective ministries. This tentative organization is to form a basis of prescribed autonolous de-centralized government entity.

Such tentative organization is planned to be transformed to the above mentioned entity by the commencement of introduction phase.

2) Formation of councils and committees

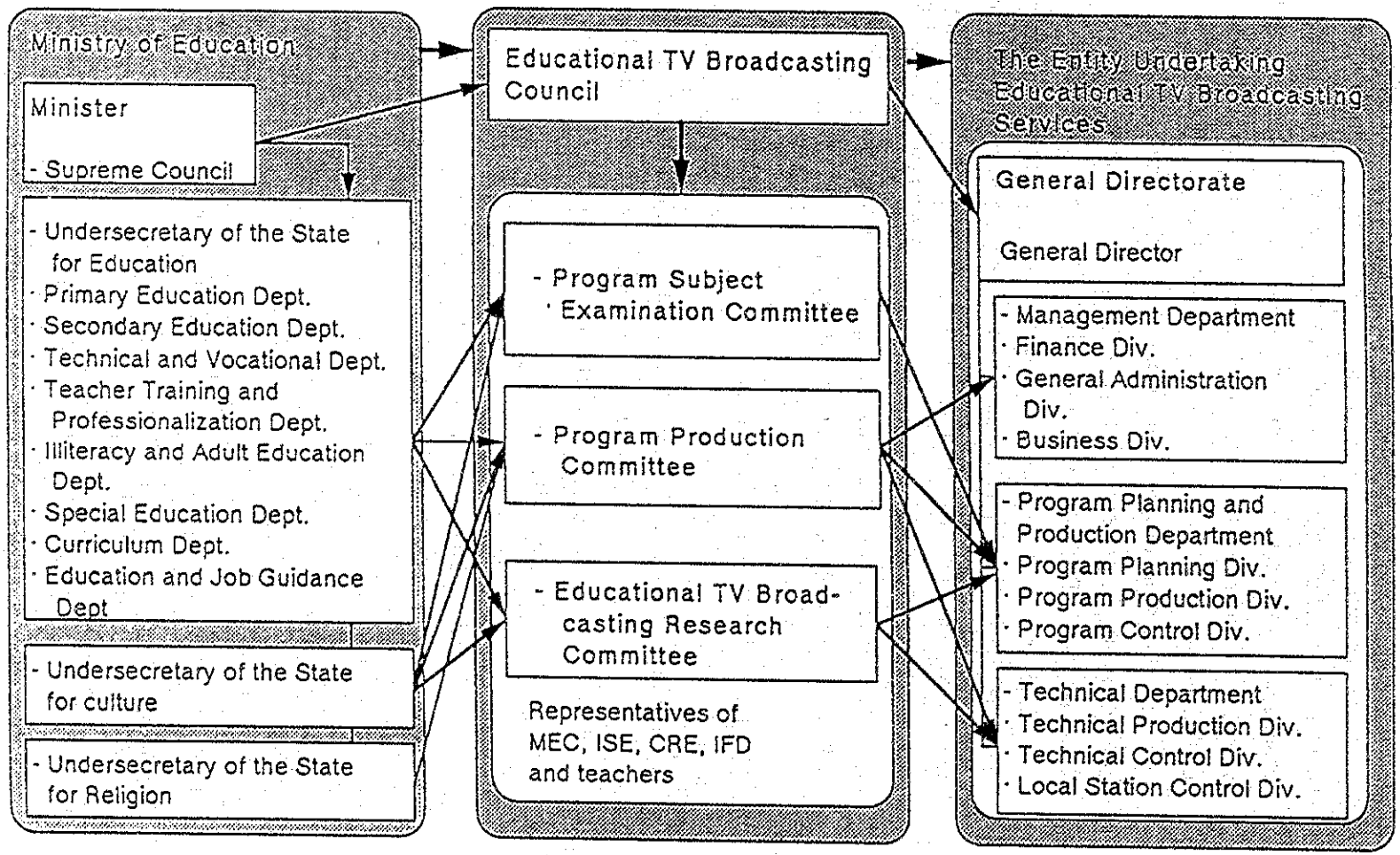
Two councils are to be formed aiming to conduct supervision and control of operating entity being established to undertake national TV broadcasting services from the view point of adjustment of its activities with the public education system. The one supervises such entity in view of whole activity with respect to public interest (namely, Public TV Broadcasting Council) and the other supervises such entity in view of education in more specific term than the former council (namely, Educational TV Broadcasting Council). The council concerned specifically for educational matter controls and manage 3 committees specialized to different type of activities concerned to the programming and production of educational TV programs. These 2 councils and 3 committees are outlined respectively as follows. Figure 4.1.3.1 "Relationship among MEC and the Entity" illustrates and indicates a conceptual relationship among MEC, councils, committees and the entity.

(i) Public TV Broadcasting Council

Role : This council administers and supervises mainly the operation plan and the activities of the general directorate of the entity so as to maximize the public benefits.

Function : The function of this council are:

Figure 4.1.3.1 Relationship among MEC and the Entity



(a) to supervise the activities and operation of the entity in general;

(b) to prepare and establish rules of operation, standards of program production, various stipulations and guidance to maintain a quality of program at certain level;

(c) to consult general directorate for a preparation of an annual programming plan, schedule, proportion of different type of programs etc. ;

(d) to supervise and control major financial matter concerned to operation of the entity.

Members : The members consisting of this council may be the representatives of following organizations:

- MEC
- MOPC
- ANTELCO
- Ministry of Health and Social Welfare
- Ministry of Agriculture and Livestock
- Ministry of Industry and Commerce
- Ministry of Justice and Labor
- Ministry of Interior
- Others

(ii) Educational TV Broadcasting Council

Role : This council administers and supervises mainly operation plan and the activities of the entity concerned to the education in specific terms so as to liaise the activity of the entity with the public education system.

Function : The function of this council are:

(a) to liaise the MEC and the entity whole matters related to the education;

(b) to formulate various policies concerned to broadcasting of educational programs directly related to the improvement of education;

(c) to prepare long, middle and short term plans on educational program production;

(d) to identify roles of educational TV broadcasting service;

(e) to establish a criteria with regard to program production;

(f) to supervise a preparation of program production through committees specifically formed for subject selection, program production and program evaluation; and

(g) to coordinate a preparation of text materials.

Members : The members consisting of this council may be the representatives of the MEC and relevant social organization related to the education.

(iii) Program Subject Examination Committee

Role : This committee supervises and consults with the department of entity in charge of preparation of program planning and production.

Function : The function of this committee are:

(a) to examine a selection of subjects to produce education programs;

(b) to supervise a preparation of program planning; and

(c) to examine a content of program from preparation of scenario to completion of program production.

Members : The member consisting of this committee may be the representatives of the MEC and personnel of following:

- MEC
- School teachers
- Distinguished persons of learning and experiences.

(iv) Program Production Committee

Role : This committee supervises and consults with the department of entity in charge of preparation of program planning and production.

Function : The objectives of this council are:

(a) to examine teaching subjects;

(b) to examine contents of programs planned to be produced;

(c) to give advice on program production; and

(d) to supervise preparation of scenario for production of educational programs.

Members : The members of this committee may be the representatives of the MEC and following personnel:

- MEC (department in charge)
- school teachers
- lecturer
- producer in charge
- technical staff for program production
- others

(v) Educational TV Research Committee

Role : This committee supervises and consults with the department of entity in charge of preparation of program planning and production to improve and maintain quality and effect of educational TV broadcasting programs in educational field in general as well as promotion of TV utilized education system.

Function : The objectives of this committee are:

(a) to prepare a system of collection of data and information, monitoring, analysis, evaluation, etc., on produced and broadcast programs;

(b) to conduct monitoring and evaluation on broadcast programs;

(c) to promote educational TV broadcasting services throughout the country;

(d) to conduct research on teaching method utilizing educational TV broadcasting services; and

(e) to prepare a plan on teacher training for promotion and incorporation of educational TV broadcasting services.

Members : The members consisting of this committee may be the representatives of the MEC, various educational and social development organizations and personnel of following:

- MEC
- School teachers
- CRE
- ISE
- Church
- Others

3) Preparation of a system to incorporate the educational TV programs into a conventional education system

The general directorate of the entity organized for educational TV broadcasting services, Educational TV Broadcasting Council, and members of committees will prepare in collaboration a system to incorporate the educational TV broadcasting service into a conventional education system aiming at improvement of quality of basic education. Such system may harmoniously be composed of following elements. The role of teachers is substantially important for incorporation of the educational TV broadcasting service into a conventional education system as the eduational TV program is planned to be utilized by the teachers in school education.

(a) Establishment of teaching method

The optimum effect of educational TV broadcasting cannot be attained by broadcasting of TV program alone but with the attendance and incorporation of school teachers into the school education using educational TV programs. Training of teachers to use and incorporate a televised educational program into conventional educational system is one of the most important and the indispensable matters prior to commencement of educationed TV broadcasting services envisioned in this project. Unless such teaching method is developed and established through repeated testing and evaluation, an incorporation of educational TV program into school education system cannot be effectively realized and an improvement of quality of education cannot be envisaged.

Such training method will be developed and established firmly by the MEC through the compilation of work cycles consisting of repeated examination, research, planning, formulation of plans, tests and evaluation which are undertaken by relevant committees under the supervision of the Educational TV Broadcasting Council.

(b) Training of teachers

Prior to enter into the following phase of exercising experimental transmitting of educational program, teaching subjects will be selected, and programs will be produced accordingly. In parallel with this work, a number of school and school teachers will be selected to use these experimental program(s) in the schools selected for experimental operation using VCRs and CATV in Asuncion. The school teachers selected should be trained at appropriate educational facilities such as the ISE in Asuncion. Through the process of training on teaching method to use TV programs in school education to school teachers, frequent evaluation of programs and modification of program content may be necessary.

The Program Subject Examination Committee selects subjects, and the Program Production Committee prepares a plan to produce programs of selected subject to conduct a teacher training. These plans will be compiled by the Educational TV Broadcasting Council and prepare a schedule for teacher training under the supervision of the MEC. In addition to these, the Educational TV Research Committee prepares a plan with regard to evaluation of program and teacher training method so as to be ready to carry out experimentation of teacher training.

(c) Coordination with conventional education system

An incorporation of educational TV broadcasting service into a conventional education system will require a coordination of schooling schedule, curriculum and a preparation of supplemental textbooks. The broadcasting schedule will be prepared and coordinated with conventional school education in such manner.

The Educational TV Broadcasting Council undertakes to plan and to supervise such coordination of systems under the supervision of the MEC.

4) Production of programs for experimentation.

Necessity of following activities are foreseen to produce programs for experimentation of educational TV broadcasting service which will form a foundation of systematized activities not only of the department and divisions in charge of the operating entity but also of councils and committees concerned. The personnel concerned to the below mentioned works will be trained through on-the-job training of which the instructors are the core members of department and divisions in charge of program planning and production as well as technical operation for program production who are available from existing manpower source in the MEC and the ANTELCO.

(a) Preparation of program scheduling and planning including a coordination works with curriculum in consultation with the council/committee concerned.

(b) Preparation of scenario for program production of selected subjects.

(c) Detailed planning for production of selected program.

(d) Formation of task-force composed of production director, technical staff, other necessary professional staff.

(e) Procurement of necessary materials to prepare a specifically designed set and visual effects.

(f) Preparation of titles by Art Section and post-production technical staff.

(g) Final checking of completed program.

(h) Final preparation to commence an experimental program in accordance with predetermined schedule.

During the process of above mentioned activities, a small scale experimentation of TV utilized education is planned to be conducted at

selected school using VCRs or CATV network available. This aims at testing of incorporation of educational TV program into conventional school education system and to improve skills relative to planning and production of program as well as contents of program on try and error basis .

5) Production of programs for the government public advertisement and information:

The public advertisement using TV related to various ministries and public corporations will be planned and the production of advertisement program or skit will be carried out. Prior to the program production a production criteria and quality standards are to be formulated by the Public TV Broadcasting Council. The broadcasting time schedule for public advertisement and information will be planned accordingly taking into consideration of progress of program production. Production of programs and their accumulation can be conducted during this phase, however, the broadcasting of these accumulated programs will be commenced from the introduction phase.

Following activities are foreseen to produce programs for public advertisement which will form a foundation of systematized process of activities not only of the department and divisions in charge of the operating entity but also of the Public TV Broadcasting Council. The personnel concerned to the below mentioned works will be trained through on-the-job training of which instructors are core members of department and divisions in charge of program planning and production as well as technical operation for program production.

(a) Preparation of program scheduling and basic planning in consultation with the Public TV Broadcasting Council.

(b) Preparation of scenario for program production of selected subjects approved by the government organization or public corporation who order to the entity to produce such programs.

(c) Formation of task-force composed of production director, technical staff, other necessary professional staffs planned to be accustomed to produce public advertisement or similar program.

(d) Preparation of title or visual effects by post-production technical staff.

(e) Final checking of completed program.

(f) Final preparation to commence broadcasting of program in accordance with pre-determined broadcasting schedule.

6) Promotion of educational TV broadcasting services to the objective schools and other educational related facilities as well as organization under the first broadcasting coverage.

Various type of explanatory promotion materials are planned to be produced which include a text showing mechanism, teaching method, educational development plans by utilization of educational TV broadcasting services and sample programs appropriately designed to promote TV utilized teaching method.

After the completion of these teaching or promotional materials, promotional activity can be commenced and scheduled campaign will be held at various educational facilities appropriate for such purpose as the ISE, CREs, major schools, etc.

This promotion campaign will include a preparation of TV sets in the schools and the educational facilities by means of vitalization of collecting donation, fund raising activity, charity, etc., to enabling the schools to procure necessary number of TV sets and antenna.

(2) Experimental Phase

After the completion of necessary arrangement to start an incorporation of educational TV programs into a conventional school education to realize objectives of the Project spelled out elsewhere in this report, an experimentation of those produced programs and testing of viability of the

system will be conducted using VCRs and CATV network so as to enter into following introduction phase operation.

The educational TV programs produced for experimental purpose will be tested when specific program production of selected subject is completed according to a preset program production procedure mentioned above.

During this phase a focal point of activity is to conduct experimentation on utilization of education TV program in school education by means of VCRs and CATV network to check a viability of an incorporation of educational TV program into a conventional educational system. Major man power input during this phase is a number of selected teachers. Department in charge of the MEC and the Educational TV Broadcasting Council and relevant committees should concentrate their efforts to conduct repeated simulation of school teaching at selected schools and the educational facilities. The operating expenditure for this phase is to be kept as minimum as possible and avoid additional budget to carry out simulation of school education utilizing existing financial resource of the MEC including the ISE, the CREs etc. It is preferable that the use of CATV is free of charge.

The major objectives of the activities scheduled during this experimental phase are:

(a) to check viability and effectiveness of incorporation of educational TV program into school education;

(b) to test the monitoring and evaluation systems prepared using program produced;

(c) to test teaching method using educational TV programs in school education; and

(d) to familiarize further with the techniques required for program production and program planning.

The contents of activities scheduled to realize above objectives are described below:

1) Checking viability and effectiveness of incorporation of educational TV programs into school education.

A certain volume but a small scale experiments on TV utilized school education using VCRs and CATV network is scheduled to be carried out during the course of preparatory period as mentioned in above paragraph. At experimental phase, such experimental activities will be carried out in much larger scale. Accordingly a number of objective school is increased substantially and deployed to important locations in the first plan broadcasting coverage area. In such a way, a concrete foundation for introduction of educational TV broadcasting services are created. During such experimental activities taken place using VCRs and CATV network at larger scale than the same of preparatory stage, teaching method of using educational TV programs in school education and method of system evaluation will be elaborated in details. Until the ETV Center would become available to the entity, checking and testing of viability and effectiveness of incorporation of educational TV program into school education should be completed. In addition to this, sufficient number of programs should be prepared and accumulated to commence succeeding introduction phase of operation.

2) Testing of system for monitoring and evaluation on produced program.

During the course of experimental operation using VCRs and CATV network, monitoring and evaluation system of educational program will be tested and elaborated further until the commencement of succeeding introduction phase using actual TV broadcasting system. To test such systems, preparation of questionnaire form, sorting of educational data to be used as a bench mark for evaluation, selection of objective school, etc., should be conducted. An experimented monitoring and evaluation systems will be used during introduction phase of operation by means of TV broadcasting system to complete such systems.

3) Testing of teaching method using TV programs in school education.

The effectiveness of educational TV broadcasting is affected by teaching skills of teachers substantially. Training of teachers on how to utilize educational TV program in school education is quite important to

ensure the effectiveness of whole system. It is planned to conduct repeated simulation of school teaching using VCRs or CATV network at most appropriate educational facilities and institutions for teacher training such as the ISE in Asuncion, the CREs at nearest location from Asuncion, and other selected places. Through repeated simulation of school teaching using VCRs and CATV network for educational program both teacher training and testing of teaching method can be realized at same time.

4) Familiarization of program planning and production.

During the course of experimental phase repeated simulation of school teaching enable a feedback of various data and information with regard to the program planning and production. In such a way, the contents of program will be improved and determined. In order to commence the introduction phase of operation using actual TV broadcasting system, enough number of programs for broadcasting is to be accumulated according to the program production plan. Through intensive program production processes, staff-in-charge will be familiarized further with program planning and production so as to be ready not only for introduction phase but also for full-scale operation phase. This period can be regarded as a technical adoption period for a core members of both technical and managerial staffs.

(3) Introduction Phase

Broadcasting of accumulated educational TV programs and other programs produced, tested and accumulated during previous stage of operation will be commenced immediately after completion of installation of TV transmitter, TV transmitting antenna, main control equipment, Studio Transmitter Link (STL) and their appurtenant facilities. Broadcasting coverage is approximately 40% of total population at this phase.

This period is thought to be a substantial technical adoption period in terms of skill development of both technical and managerial staff. Tested and evaluated system to incorporate educational TV broadcasting service into conventional school education system would be elaborated further during this phase.

In addition to this, a broadcasting of public advertisement and private commercial advertisement would be introduced into the program planned on Saturday and Sunday. However, the public advertisement will dominate most of time frame available for advertisement at the beginning of this phase. Contents of such advertisement planned to be supervised and consulted by the Public TV Broadcasting Council as mentioned previously. Through the broadcasting such advertisement, relative fees are planned to be examined.

During this phase, a focal point is a substantial adoption of technical and managerial manpower and evaluation of educational system utilizing TV program into school education. A basic frame work of incorporation of educational TV program into school education created during a proceed of previous phase would be elaborated further applying educational TV programs of various subjects. Increased volume of program production and operation of newly installed equipment such as transmitter will require an expansion of technical and managerial personnel.

Existing manpower resources of the ANTELCO will be utilized to meet such demand. The MEC will provide most of additional manpower in-charge of managerial works. In such a way, the operational expenditure will be minimized as much as possible.

The major objectives of scheduled introduction phase are:

(a) to introduce educational system using TV broadcasting into school education definitely;

(b) to reinforce the ability of production staff and to increase a number of staff; and

(c) to test broadcasting of public and private advertisements.

The contents of activities scheduled to realize such objectives are described below:

1) Introduction of educational system TV broadcasting system into school education.

Tested and accumulated educational TV programs during the course of previous phases will be broadcast actually to introduce such programs in school education at fairly large scale. Until entering into this phase following matters should have been completed as a prerequisite condition to commence educational TV broadcasting services:

(a) Various programs have already been produced under the supervisions of the Educational TV Broadcasting Council and different type of Committees mentioned in the aforementioned paragraph in accordance with program criteria and standards established.

(b) Technical staff concerned to transmission and broadcasting operation have received necessary training on operation and maintenance in the manufacturers' factory and ready to commence broadcasting service.

(c) Testing of educational TV program teaching method has been completed through simulated school education using VCRs and CATV network.

(d) Enough number of teachers have already received a training on the use of educational TV programs according to the predetermined schedule.

(e) Trained teachers are deployed to the selected schools and educational facilities within the broadcasting coverage to be ready to commence an utilization of educational TV programs into school teaching system.

(f) Teaching text or materials deemed necessary have already been prepared.

(g) TV sets and antennas have been furnished as much as possible to the selected schools and educational facilities within the

broadcasting coverage to be ready to receive broadcasted programs.

(h) Tested monitoring and evaluation method on educational system using TV broadcasting have already propagated among selected organization such as the ISE, the CRE,the IFDs etc.

Upon completion of above matters, an actual TV broadcasting operation will start to introduce educational TV broadcasting services. Development of coordination among 3 sides (transmitting, receiving and supervising) in utilization of educational TV broadcasting services for education will proceed. Through periodical and scheduled monitoring and evaluation of the functioning of the system, quality and level of program planning and production will be improved and developed further.

2) Reinforcement of ability of production staff and increasing a number of professionalized staff to adopt necessary technical skills.

Number of core member staff both technical and managerial fields would have been trained and formed to be as a basis of future manpower development through the preparation and exercise of various activities during experimental phase mentioned previously. This core staff will not only to produce programs necessary for the experimental operation to start introduction phase but to conduct on-the-job training of potential selected staff thoroughly to increase the number of trained professional staff in various fields of activities so as to meet the requirements of manpower for ever increasing volume of production of programs.

3) Testing of broadcasting of public and private advertisements.

Broadcasting of public and private advertisement is planned to be commenced during this phase. Public advertisement may be programmed for appropriate time frame through the week and commercial advertisement are planned to be attached mainly to the programs broadcast on Saturdays and Sundays. Production of public advertisement programs have been also commenced when number of program production staff is increased and their skills are developed sufficiently and ready to produce such programs. Management system will be tested on collection

of orders of such advertisements and fees of such program production and program broadcasting as a revenue of the operation entity.

(4) Full-scale Phase

The full-scale phase is deemed to be as a period to enrich the quality and variety of educational programs based upon the established, tested and evaluated system of educational TV broadcasting services in relation to its incorporation into a conventional school education system. This means that the fundamentals of system operation has been completed at the termination of previous introduction phase but program time frame is not fully occupied at the commencement of this phase. The completion of full-scale phase means that the program time frame is completely filled or occupied by scheduled broadcasting programs. During this phase, TV sets will be furnished to each school and educational facilities. Promotion of VCR installation will also be carried out.

When the institutional development of the members consisting of not only operating entity but also external organizations such as Educational TV Broadcasting Council, various committees related thereto, and the Public TV Broadcasting Council would reach to sufficient level with respect to volume and a quality of program planning; program production; program transmission; operation and maintenance of facilities; increased number and variety of broadcasting program can be realized to fill the program time frame fully.

During this phase, the focal point is an enrichment of quality and variety of programs and increased number of programs. Until the termination of previous introduction phase, a preparation of education system utilizing educational TV program is completed. As to fill the program time frame, numerous number of program is needed to maximize an effective utilization of investment on construction of studios and broadcasting network.

The core technical staff created in the previous phase will conduct intensive training of additional technical staff required to produce sufficient number of programs. Operating expenditure and other expenditure will increase substantially in comparison with previous phases due to sharp increase of program production. However, the revenue generated by selling TV time space not only to public entity but also to private interest will start to be collected.

In such a way, the revenue is planned to trade off the operation expenditure as early as possible.

The major objectives of full-scale phase are:

(a) to increase variety of educational program and other type of programs;

(b) to conduct a live broadcasting;

(c) to expand the value and volume of production and broadcast of public and private advertisements; and

(d) to incorporate foreign educational program at appropriate degree.

The contents of activities scheduled to realize above objectives are described below:

1) Increase of a variety of educational program and other type of programs.

As technical skills to produce and programming quality educational program develop and progress, variety of program can be increased in the field of education and other field appropriate for broadcasting.

2) Conduct live broadcasting.

As technical skill is developed and improved on conventional program production, then, a live broadcasting such as news program and relay program (Outside Broadcast, field work) will be conducted and introduced into the TV broadcasting services.

3) Expansion of value and volume of production and broadcasting charges of public and private advertisements.

As the number of programs scheduled to be broadcast on Saturdays and Sundays increased and developed further, a number of time frame can be allocated for advertisement purpose would be increased. Accordingly volume and value of advertisements would be increased. Management system would be developed and effectuated to collect orders of advertisement from public agency and corporations or private companies. An increased revenue from such fees and charges would cover major operating expenditure of operating entity gradually.

4) Incorporation of foreign educational program at appropriate degree.

As revenue from advertisement increases an incorporation of foreign educational programs would become available on own account. Such foreign program should be checked and selected by relevant council and committees. The overseas broadcasting services of IBEROAMERICA is one of the example for such foreign educational program.

4.2 Organization Plan

4.2.1 Administrative Structure

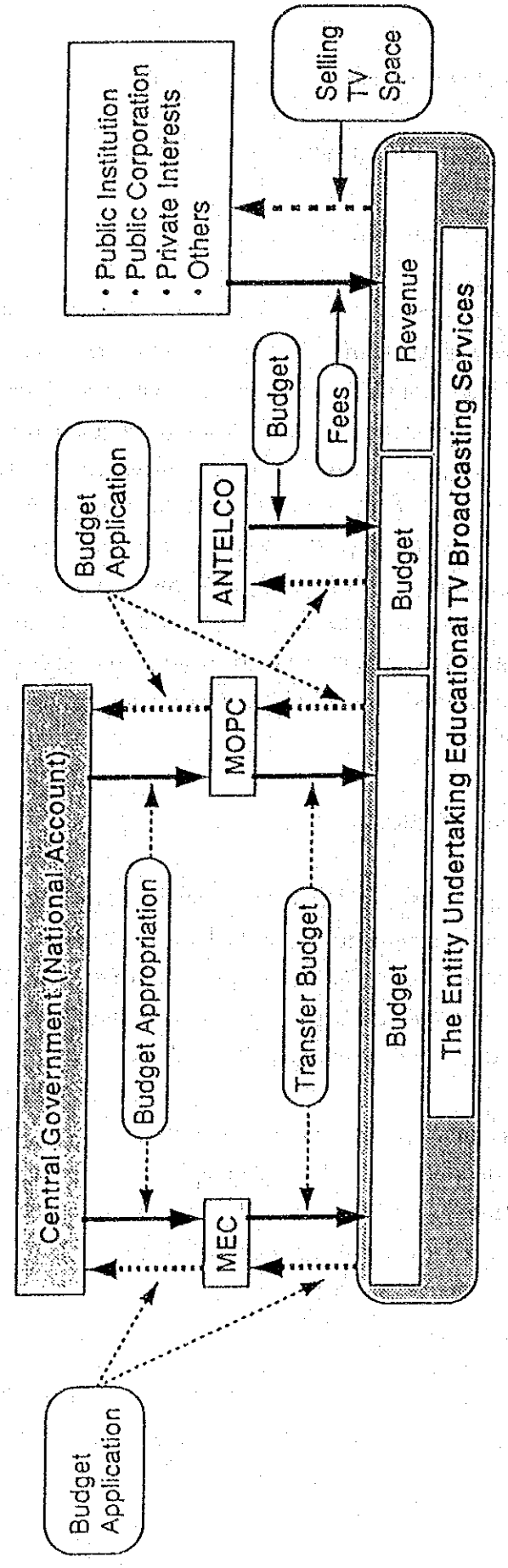
(1) Type of Organization

Type of organization planned is an autonomous de-centralized government entity newly established under the authorization of the Government to undertake educational TV broadcasting services. This entity will be evolved to the status of the public corporation when the amount of revenue generated from selling TV program space to private interests is increased to cover all the expenditure fully. The government administrations concerned and supervise this entity are the MEC and the MOPC. The general directorate of this public corporation (administration body of the entity) to operate and manage this organization planned to be formed is consisted of number of representatives of the MEC and the MOPC. The representative of the MOPC will include the representatives of the ANTELCO in view of government administrative structure.

(2) Financial Structure

The major part of the entity's budget consisting of operation expenditure and financial expenditure is planned to be financed out of the national budget via the MEC and/or the MOPC as their transfer budget. A part of the budget of the entity is planned to be financed out of the own budget of the ANTELCO as an independent public corporation. As development progresses, a revenue generated by selling of TV program space to public institutions, public corporations and private interests will increase. However, amount of such revenue from selling of TV program space to private interests will not trade off the operating expenditure within a period covered by this feasibility study. Figure 4.2.1.1 "Financial Flow" illustrates and indicates the flow of national budget and financial structure of the entity.

Figure 4.2.1.1 Financial Flow



(3) Government Administrative Structure

The organization planned to be formed is of an autonomous de-centralized government entity, therefore, its operation and management are autonomously conducted and independent from the direct government administration. The unique feature of this organization is to form a part of national education system. In this government administrative point of view, it is planned that special councils formed by relevant government administrative organization will supervise this organization in view of public education as mentioned previous sub-chapter.

The production of educational programs is to be supervised and control by special committees mentioned below which will be formed and these committees are mandated to liaise this organization and government administration relative to education.

(4) Councils and committees

The outline of councils and committees are described in previous Chapter 4.1 "Management Plan". A conceptual relationship among councils, committees and operating entity is illustrated copnceptually in Figure. 4.1.3.1 "Relationship among Councils, Committees, and the Entity". These councils and committees supervise and control the program planning and production process so as to coordinate and maintain institutional link with the government public education system.

4.2.2 Organization Structure

(1) Management System

The managerial administrative structure of organization for the operation of the educational TV broadcasting services can be divided in 4 managerial functions as follow:

1. Top management function

2. Program production management function

3. Technical management function

4. Administrative management function

Top management controls other 3 management functions as mentioned above, one controller controls three controllers which is a principal of designing of organization adopted as prescribed in the Master Plan.

Top management function is represented by General Director which is directed by general directorate (Member of the board). Program production management is represented by Department Chief of Program Planning and Production Department. Technical management function is represented by Department Chief of Technical Department. And administrative management is represented by Department Chief of Management Department.

(2) Organization Development Plan

The implementation of the Project is planned to be proceeded on phased development scheme and the organization is planned to be developed and expanded year by year.

The descriptions of the organization mentioned below is based on the outline of the organization at the time of full-scale operation phase which is the final shape of developed organization as illustrated in Figure 4.2.2.1 "Organization Chart".

The outline of the organization at starting period is much smaller than this final shape of organization in terms of number of personnel and number of divisions or sections. The organization chart at preparatory and experimental phase is shown as per Figure 4.2.2.2.

(3) Detailed Job Structure and Descriptions

Relevant job descriptions of each department, division and section are outlined below:

1) General Directorate

General Directorate is composed of representatives of the MEC, the ANTELCO and the MOPC. The Public TV Broadcasting Council and the Educational TV Broadcasting Council organized externally are mandated to supervise and control the General Directorate when necessary for directing its operation in specific issues and matters.

General Directorate manages, supervises and controls whole organizational activities of the organization at a top management level with external support of external councils mentioned above formed under the supervision of relevant ministries and agencies. Advisory committee composed with professionals and advisors of different fields is planned to be attached to the General Directorate to support a top management of the organization periodically. This General Directorate supervises (I) Program Planning and Production Department, (2) Technical Department, and (3) Management Department. Structural outline, functions, responsibilities, job description etc. of these department are described below.

Figure 4.2.2.1 Organization Chart at Full-scale Phase

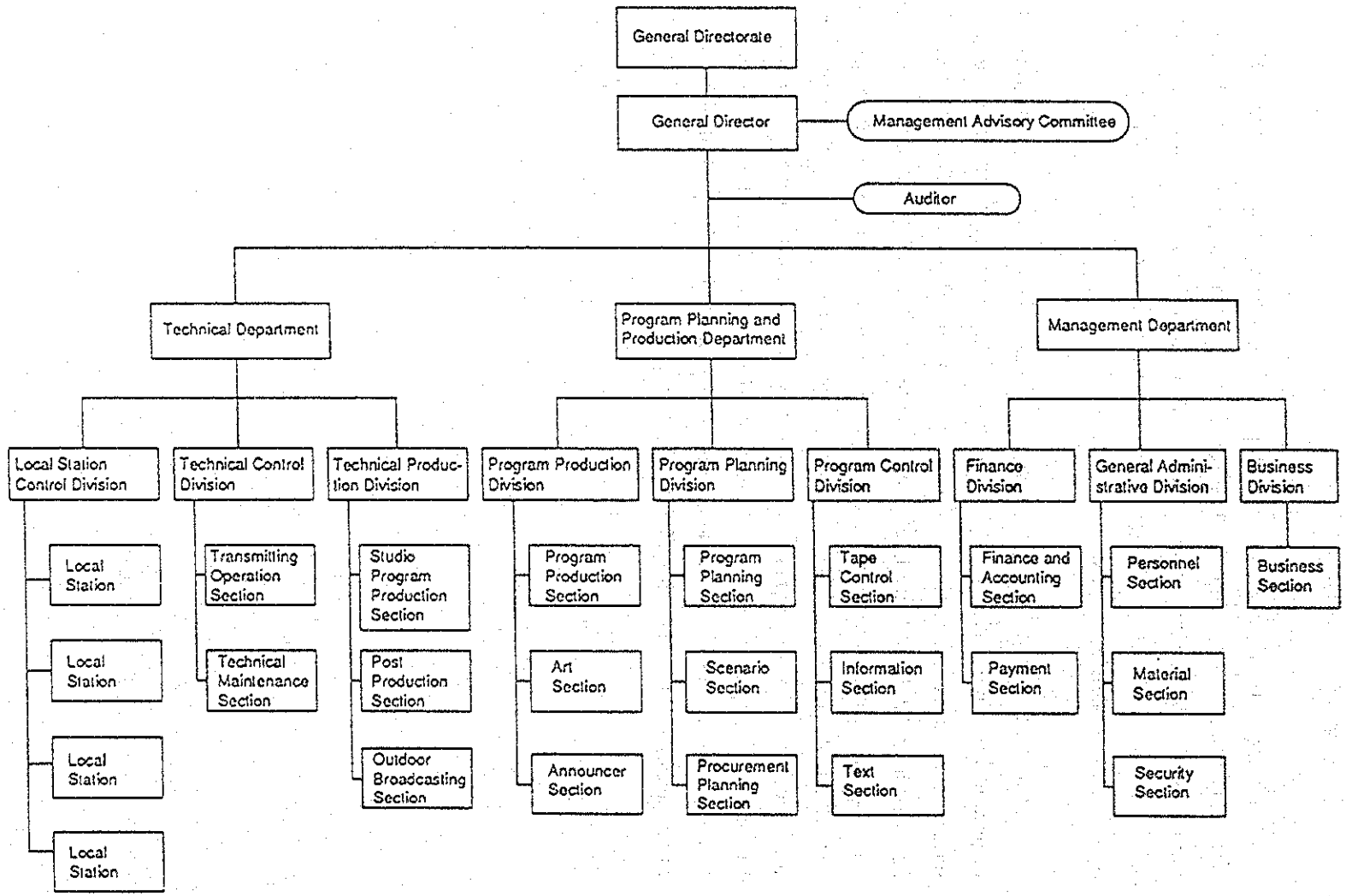
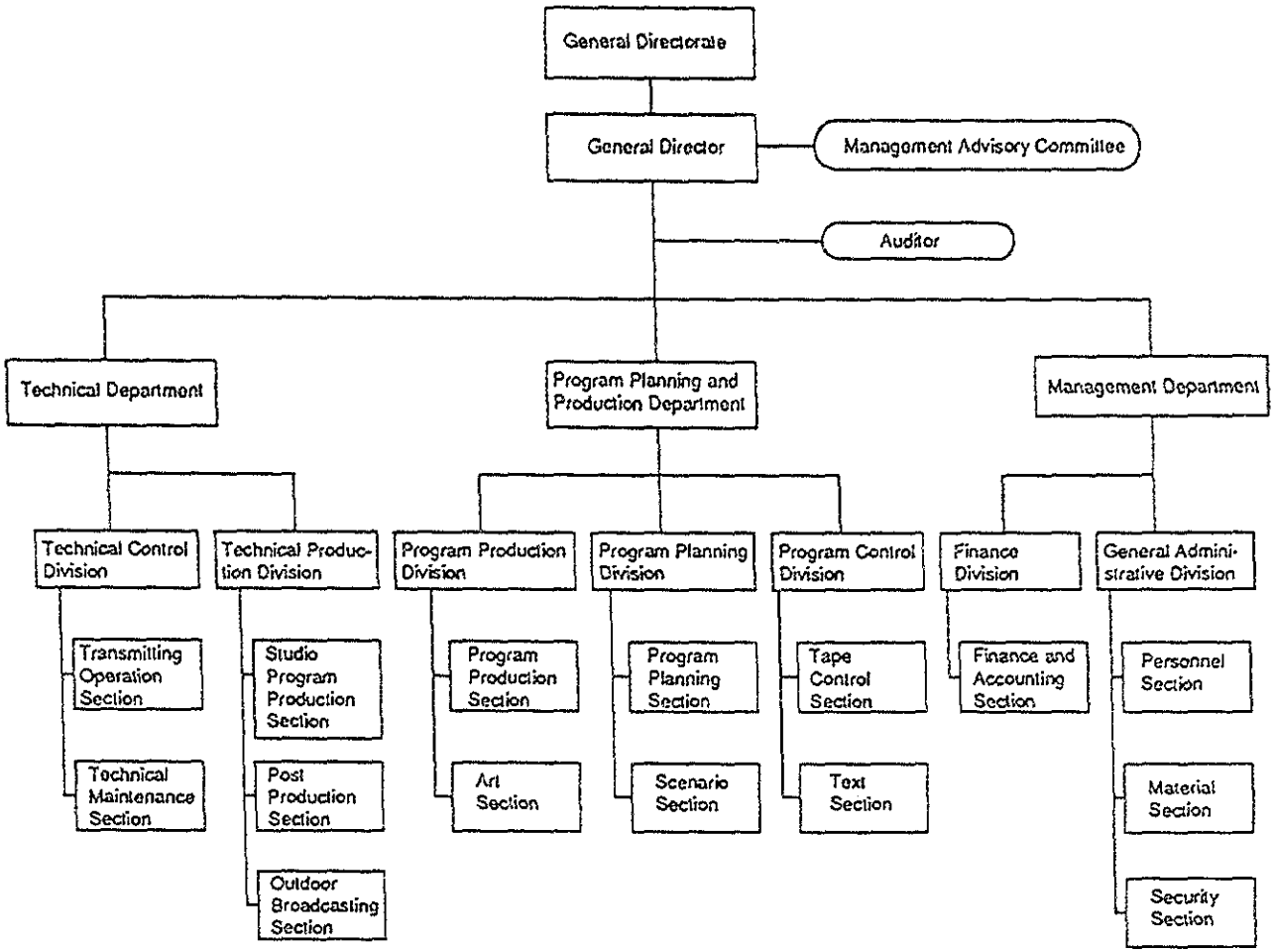


Figure 4.2.2.2 Organization Chart at Preparatory and Experimental Phase



2) Program Programming and Production Department

This department is responsible for production of programs and composed of following divisions:

1. Program Production Division

2. Program Planning Division

3. Program Control Division

A brief description of jobs undertaken by each divisions mentioned above are as follows:

(2-1) Program Production Division

This division is formed with 3 specialized sections as (a) Program Production Section, (b) Announcer Section, and (c) Art Section.

This division undertakes production of programs by teams of different professionals under a supervision and control of Department Chief. The roles and functions of the above mentioned sections are as follows:

(a) Program Production Section

This section is composed of number of Program Directors and their assistant directors who are directly responsible to direct production of programs including detailed planing of program production.

Each Program Director assigned to a specific program production assumes full responsibility for the production of program, involving himself in the entire process of program production from beginning to the end. The Floor Director, assistant director and assistant for performer all assist Program Director to complete the program planned to be produced exactly as Program Director intends. While the Program Director is responsible for the entire program, the Floor Director is in charge of the studio floor. The assistant director and

assistant for performers, who are both under the direction of the Floor Director, prepare and check various materials such as the diagrams to be used for the program or prepare equipment for studio experiments. The assistant for performers should have understanding, specific knowledge and skills regarding the subject of the program.

(b) Announcer Section

This section is composed of announcers who may appear as moderators or interviewers as TV station's regular employees. Performers appear in the program may be specialists, teachers and/or actors.

Specialists are professors, staff at research institutes, opinion leaders in various fields, etc., whose views are distinguished and respected due to their status and expertise. Teachers are preferably be of leadership quality who are well versed in education and able to narrate to students of level of education designated to be a subject of educational program. Actors are not only indispensable in skits but are also useful as interviewers, having facial expressions and ways of talking that can appeal to viewers. Actors sometime may even take the role of teachers for young students.

Performers in the program who are not regular employ will belong for necessary period to this section and will be under the direction of Section Chief of this section.

(c) Art Section

This section is composed of staff to prepare set and graphics for program production supported by professionals for make-up of announcers, casters and other persons who appear in the program, and staff to plan and procure necessary materials for program production. The members of this section are professionals in different fields such as studio set, make-up, costume, computer assisted graphic designer, sound effect specialist, etc., all under the direction of the Art Director.

The Art Director is responsible for the general planning of arts and crafts used in the program, consulting various experts in the subject field. The area of art is quite wide, as it includes determination of title lettering, studio sets, locations, costumes of performer, props, pictures and captions needed for explanations of the program, puppets for puppet shows, etc.

The creator of effects directs the audio part of the program by using sound effects and music, so that the image is conveyed more effectively to the audience.

The Title C. G. is responsible to create titles using computer graphic equipment as directed by Art Director.

(2-2) Program Planning Division

This division is responsible for and undertake program planning, programming and preparation of scenario of the programs in accordance with the intention of Program Directors of Program Production Section designated to work for production of planned programs.

This division is formed with 3 specialized sections such as (a) Program Planning and Programming Section, (b) Scenario Section, and (c) Procurement Planning Section. The brief job descriptions of these sections are as follows:

(a) Program Planning and Programming Section

This section is responsible for a preparation of master schedule for the production of programs.

This section prepares annual broadcasting plan and upon this annual plan a detailed program schedule is prepared taking account of target viewers, contents of programs, educational goal, etc. The program planning is directed by the General Directorate and its process includes and based on consultation with committees externally organized to supervise and control of principal of program

content and schedule taking account of strategically selected viewers, contents to be taught, and educational goal of the subject year.

(b) Scenario Section

This section is responsible for preparation of scenario and editing of programs planned to be produced by Program Planning and Programming Section. This section places orders to a number of scenario writers out of the organization and responsible for promotion of their skills and professionality. The contents of scenario for educational program is to be inspected and checked by the Educational TV Broadcasting Council.

This section is composed of editors who control and supervise the preparation of scenario done by the Program Directors and the scenario writers out of the organization. Scenario of program planned to be produced will be handed over to Program Production Divisions, then, the program will be produced based on such scenario but directed by Program Director of Program Production Section.

In some cases, the Program Director participates into scenario preparation or Program Director himself prepares draft of scenario and Scenario Section elaborates and complete them to use for program production.

(c) Procurement Planning Section

This section is responsible for preparation of procurement plan and procurement of materials required for the program production. Materials to be procured are planned and demanded by Program Planning Section and Scenario Section in association with Program Directors assigned for the program planned to be produced. Procurement plan will be instructed to Material Section, General Administrative Division, Management Department for actual procurement.

(2-3) Program Control Division

This division is responsible for and undertaking management of storing and pick out stored program for broadcasting as well as collection of information and materials necessary for program production. This division undertakes also preparation and printing of text materials for educational TV broadcasting program.

This division is formed with (a) Tape Control Section, (b) Information Section, and (c) Text Preparation Section. The brief job descriptions of these sections are as follows:

(a) Tape Control Section

This section stores produced programs in order to be used for broadcasting in accordance with pre-determined schedule for broadcasting. Collected recorded video tapes which will be used to produce program is also stored and recorded on store keeping record to be sorted out when necessary.

(b) Information Section

This section collects information, data and useful materials to be utilized for program production. Such information in shape of scenario, computer graphics in diskette, picture, book, film, video tape, etc., are sorted out to be ready to use when demanded by the Program Director, Program Production Division.

(c) Text Preparation Section

This section prepares various type of texts of which drafts are prepared in conjunction with Program Planning and Production Department. Draft of text prepared in this section will be printed, produced and distributed by concerned organization such as the MEC and other government agencies.

3) Technical Department

This department is responsible for production of programs technically and transmitting produced program. This department is composed of following divisions.

1. Program Production Technical Division

2. Operation and Maintenance Division

3. Local Stations Control Division

A brief description of jobs undertaken by each division mentioned above are as follows:

(3-1) Program Production Technical Division

This division is formed with 3 specialized sections as (a) Studio Production Section, (b) Post Production Section, and (c) Outdoor Broadcasting Section.

This division is responsible for production of programs in technical point of view by teams of different professionals under the direction and the supervision of Program Director, Program Production Section of Program Production Division. The roles and functions of the above mentioned respective sections are as follows:

(a) Studio Production Section

This section is formed by a number of groups consisting of professional technical personnel required to produce program under the direction and supervision of Program Director who is assisted by Floor Director both of whom belong to Program Production Section.

A group of professional technical personnel is basically composed of following experts:

- TD switcher
- Cameraman
- Sound mixer
- VT Operator
- Lightman
- Assistant technical staff

TD Switcher is in charge of the program production from technical aspect with cameraman, lightman, sound mixer, etc. TD Switcher is deemed as Technical Director who is a leader of the group and the works in cooperation with Program Director but under his direction. In ordinary lecture-style program in a studio, composition of group of experts may be as follows:

Nos.	Experts
1	TD switcher (Technical Director)
2 -3	Cameraman
1	Sound mixer
1	VTR Operator
1 -2	Lightman
1	Assistant technical staff

Number of staff for different jobs may be flexibly exchanged among groups to meet with the requirement of different type of program production. Basic formation of group is maintained always to keep an effective technical performance created from a team work spirit.

(b) Post Production Section

This section is responsible for post-production of program when necessary under the supervision of Program Director, Program Production Section, Program Production Division.

This section is formed with a number of experts of operating different type of equipment and fields. A basic formation of expert as a group is as follow:

Nos.	Experts
1	TD Switcher (Technical Director)
1	Sound Mixer
1	VTR Operator

TD Switcher is deemed as a leader of the group and works in cooperation with Program Director but under his direction.

(c) Outdoor Broadcasting Section

This section is responsible for production of program in technical aspect for outdoor broadcasting using Outside Broadcasting Van and outside production equipment.

This section is formed by a number of groups consisting of professional technical personnel required to produce program elsewhere outside of the studio under the direction and supervision of Program Director of Program Production Section.

A group of professional technical personnel is basically composed of following experts:

- Electronic Field Pick-up, Cameraman
- Electronic Field-Pick-up, Sound mixer
- Lightman
- Assistant technical staff

This group of experts works in cooperation with Program Director but under his direction.

(3-2) Operation and Maintenance Division

This division is formed with 3 specialized sections as (a) Transmitting Operation Section, (b) Maintenance Center, and (c) Local Station Control Section.

This division undertakes transmitting programs and maintain whole equipment composing a broadcasting network. The roles and functions of above mentioned sections are as follows:

(a) Transmitting Operation Section

This section is responsible for transmitting of programs through control process in accordance with definitely scheduled broadcasting program.

This section is composed of professional staff for operation of transmitter and mixing process.

(b) Maintenance Center

This section is composed of professional staffs for repair and maintenance of different group of equipment for transmission, program production in studio and outdoor operation, as well as video taper recording. This center covers the maintenance requirement of whole equipment and facilities of TV station. The equipment of local stations and repeaters are maintained by group of engineers and technicians assigned to local stations, however, they are centrally controlled by this center.

In the future, when the local stations are established, this section would become as a center to control the maintenance activity of local stations.

(3-3) Local Station Control Division

This division is responsible on supervision and control of operation and maintenance of local stations and repeater stations throughout the country.

4) Management Department

This department is responsible for administration and management of organization under the direction of top management and is composed of following divisions.

1. Finance Division

2. Administration Division

3. Business Promotion Division

A brief description of jobs undertaken by each divisions mentioned above are as follows:

(4-1) Finance Division

This division is formed with 3 specialized sections as (a) Finance Section and (b) Accounting Section, and (c) Procurement Section.

This division undertakes financial management, accounting, taxation, contract management etc. The roles and functions of the above sections are as follows:

(a) Finance Section

This division is composed of financial management specialists, contract management specialist and financial controller. The roles of this division is to estimate financial needs and establish financial schedules and control the financial matters for operation of the organization.

(b) Accounting Section

This division is responsible for accounting, collection and payment of moneys for operation of the organization. Accounting report is recorded and payment for routine works will be handled by this division.

(c) Procurement Section

This section is responsible for procurement of necessary materials for program production, any materials to be procured for operation of the entity.

(4-2) Administration Division

This division is composed of (a) Personnel Section, (b) Material Section and (c) Security Section; and undertakes all general administrative matter of the organization. The roles and functions of these sections are as follows:

(a) Personnel Section

This section administers all matter concerned employment and training of staffs and manages an insurance of employees.

(b) Material Section

This section prepares a periodical procurement schedule for major materials required to produce planned programs. The contents of materials to be procured is planned and coordinated with persons in charge of program production. Materials planned to be procured are procured by Procurement Section mentioned above.

(c) Security Section

This section is responsible for security of building, facilities, personnel, etc., attached to the entity.

4.2.3 Tentative Operation Entity

As described in the Master Plan, until the establishment of the organization planned above in terms of authorization of the government, a tentative organization is planned to be formed jointly with the MEC and the ANTELCO to represent the MOPC. However, until the commencement of an experimental phase or at latest an introductory phase planned permanent organization should be established to have legal status.

CHAPTER 5 OPERATION AND MAINTENANCE PLANS

5.1 Operational Plan for Production and Transmission

The period of the Priority Project is from the 1st year to 8th year of the total developmental 16 years of the Master Plan. Since it is started from nearly "O" status in terms of school education program production together with various necessary systems which are essential to conduct a continuous and developmental operations, such as establishing committees and meetings as well as preparation of text books etc., this period is very important to assure or consolidate a firm foundation for establishment of the nationwide educational TV broadcasting network in this country.

In the following pages, it will be described that how to conduct the each developmental year's practical operations and maintenance of the broadcasting equipment on the basis of plans for programing and facilities. Here, what is to be taken into consideration is that the planning should be based on the actual conditions in Paraguay and how to develop it smoothly and effectively.

(1) Preparation Phase (1st year)

Since the present technical staff number is 8, a few new staff shall be recruited in order to fill the required number of staff and at the same time, to foster additional staff for the succeeding developmental year. Some of those staff at present in "Teleducación Departamento" are working on half day contract basis, so that the working condition of those technical staff shall be changed to full day working.

In the first year, as mentioned above, the number of programs to be produced is 50 using 2 studios at MEC and old IPT. The capacity of the studios for production is 200 days × 2 studios = 400 days·studios which is more than enough for the 50 program productions. In this case, although 400 ÷ 50 = 8 days can be assigned for one program production, but the studio crew is only one, so that actually available studio days will be 8 ÷ 2 = 4 days for each studio production work. Therefore, each PD shall try to make his/her program within 4 days. Since it is the beginning year to produce formal educational TV programs for which they are not accustomed to, they must try to train themselves to

complete one program production within one day working. By doing this, the crew can be more accustomed to the production works and further more, the team-work of the crew will be more consolidated.

Thus, after one year of 50 program productions, they can be a core experts to train the succeeding new comers.

The duties of those studio experts are, not only for the studio production works, but also for assisting works for producers' works such as demonstration in actual school classes by bringing the demonstration equipment there and setting up the monitoring devices in the classes.

All of those core experts are preferable to be trained during the first year by some adequate training organization, either in domestic (such as SNPP etc.) or in foreign countries at the cost of "Teleducatcón Dep. of MEC", on, not only practical skills, but also on theoretical knowledge of TV engineering. Normally this kind of training for ETV both on PDs and technical engineers will take at least 3 months, so that additional staff number of 25% (3 months ÷ 12 months = 0.25) shall be taken into consideration for the new staff recruitment.

Summarizing the above, the required number of production staff are as follows:

Chief Producer	2 (To be trained)
PDs	6 (To be trained)
Studio Technical Crews	10 (To be trained)
Technical Director-Switcher (TD-SW)	
Video Engineer	
Cameramen	
Lighting Director	
Audio Mixer	
Art Designer	3 (To be trained)
Production Assistant (OJT)	4

(2) Experimental Phase (2nd year)

From this year, distribution of educational programs produced and evaluated during the 1st year together with newly made programs of this year will be regularly started through Asunción citie's CATV to some designated primary schools and educational organizations for teachers and for illiterates.

In order to promote the provision of TV receivers together with VCRs for schools as many and as quickly as possible, such promotion programs shall also be made and transmitted by the CATV. Because, provision of VCR with TV receiver will eliminate the definitive week point of TV broadcast education which is that TV is always passive receiving and not repeatable, in other words volatile. In the case of VCR prepared, it can record the educational programs and can be replayed at any time and any part when necessary for the users.

According to the programing plan stated in 3.2.3 (4) 3), the actually workable number of PDs are 8 and the average production span (= S) will be reduced to 10 days so that the producible program number (Prog. NO. = P) is calculated by this formula;

P = PDs × 200 day/year ÷ S days, namely
8 PDs × 200 day/year ÷ 10 days = 160 programs/year

As to the studio production capacity, the 160 production/year is far below the limit of 2 studios' capacity which is 400 program productions/Year (200 usable days/year × 2 studios) at a condition of 1 production per one day studio work. However, in comparison with the previous year, the production span of each PD is shortened from 20 days to 10 days in this year which can be achieved through the previous 1 st year's self training.

As for the training of the production staff, newly recruited 5 PDs shall be trained on OJT basis as well as in foreign training institutes.

With regard to the studio experts crew of 10 persons, it can cope with the 160 program productions per year, because it is less than their workable days of 200 days per year. But, for preparation for increase of program production of the 3rd year, another crew of 10 persons shall be gradually recruited during this year, and trained as production assistants, so that smooth development to the next year can be achieved.

Those new comers shall work also for ETV monitoring set arrangement at some designated classes conducted by PDs.

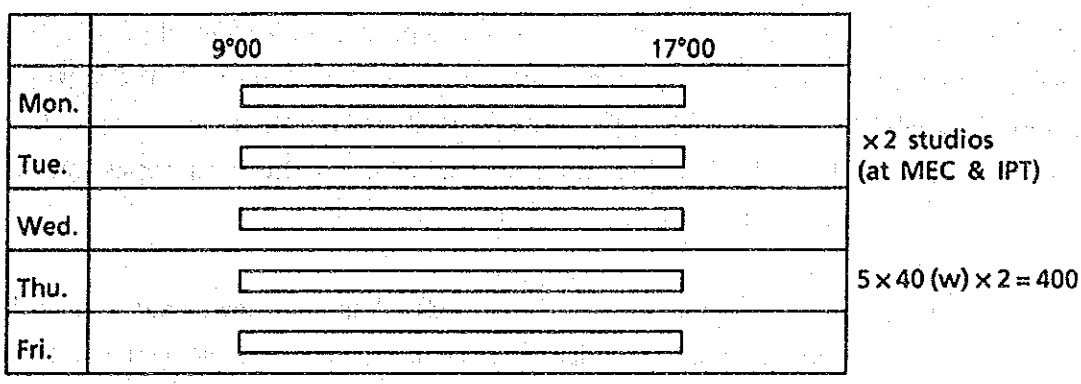
In addition to that, during the 2nd year, an installation work of TV transmitter at ISE site will be carried out. This is a good chance to train the transmitter engineers by associating the installation engineers coming from abroad. Likewise for studio engineers, cooperation with foreign studio engineers for installation works of tentative master control equipment at Don Bosco ETV Head Quarter together with STL (Studio-Transmitter Link, micro wave link) installation and adjustment, will be indispensable.

Summarizing the above, at the end of the 2nd year, total number of the production and transmitting engineers are amounted as follows:

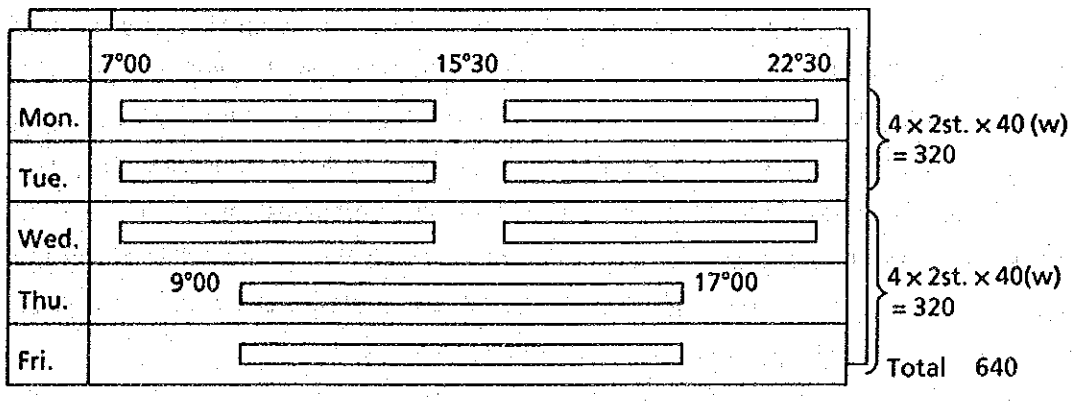
	1st year		2nd	
PDs (including chief PDs)	(8)	→	11	
Studio Technical Crews (including studio chief engineers)	(10)	→	20	(surplus are for training and installation work)
Art Designer	(3)	→	5	
Production Assistants (OJT)	(4)	→	6	
TV Transmitter Engineers	(0)	→	2	

(3) Introduction Phase (3rd year)

By completion of the TV transmitter construction at ISE site and reinforcement of studio facilities during the 2nd year, the 3rd year operation becomes much more busy. From this year, with the new facilities, the operations will become an Introduction Phase. Actual TV broadcasting from the transmitter starts the operation and practically workable PDs are increased to 12 according to the programing plan. Since the production staff will have been engaged for already 2 years' daily operation, they will be much experienced in the production. From this year, the average production span of each PD will be further shortened to 5 days (1 week). According to the formula P = PDs × 200 days/year ÷ S (P. span); 12 PDs × 200 days/year ÷ 5 = 480 programs/year will be produced. As this 480 production/year exceeds the afore-mentioned 2 studios' capacity of 400 production/year, at the condition of one program production per one weekday, as shown bellow.



The production capacity shall be increased to 2 productions per some working day as shown bellow.



In the above case, the capacity of the 2 studios increase up to 480 productions/year. In order to cope with this, at the same time, the number of crew shall also be increased. Because, in the previous year, 2 studio expert crews have been prepared which can maximum cope with 400 productions/year. The excessive 80 (480 - 400 = 80) productions have to be done by an addition of production crew for some working day operation. (In this case 3 working days operation with 2 shifts productions a day)

In order to proceed to the next 4th year operation, during this year, the number of the production crew shall be increased to 3 crews, so that it can cope with maximum 600 productions/year; (200 production/year × 3 crews). The surplus crews can work for EFP (Electronic Field Production; using Camera-VTR outside of the studio), so that program contents will be much enriched.

Likewise the previous year, evaluation of the produced programs at the designated schools shall be continuously conducted. From this year, a multiple VCR cassette dubbing equipment be provided in the Master Control Room of the Don Bosco ETV H.Q. This can dub the evaluated programs (recorded on 1/2 inch component professional VTR) on·to a number of consumer type VCR tapes which can be delivered to regional cities and distributed by CATVs there, or even in a far remote schools such as in Amambay or Chaco area, the VCR tapes can be used as educational TV in the classes.

The operation of Master Control Room (MCR) is also newly added in this year. The functions of the MCR are to send programs in a continuous time sequence by switching various program sources such as VTR play back pictures and pictures of the studio camera which takes news caster and/or weather information board etc. in the studio, on live.

Since this operation is on line operation without any vacation and holiday. The technical staff of the MCR are 3 with 2 shifts a day including T.D., VTR operators and operator of the studio at the beginning, then, with development of the broadcast programs, the staff will be increased to 5 for the next 4th year's operation. In addition to that, an operator/monitoring staff of the TV transmitter shall be assigned to the ISE Transmitting site. Since it is an on line operation with 2 shift working a day in the separate place, the required number of the operators shall be 4 (2per. × 365 ÷ 200 = 3.7 ≒ 4).

Since the new ETV transmission is on a frequency of Channel 6 which is in low band of VHF channels, a new receiver's antenna covering the low band is necessary to be installed. The transmitter engineers shall guide the viewers how to receive good pictures of the EVT signal, by using the broadcast programs or practical advice on the spot such as correct directioning of the receiving antenna, feeder arrangement etc. Therefore, the transmitter engineers shall also master TV receiver's theory.

Summarizing the above, at the end of the 3rd year, total number of the production and the transmitting staff are amounted as follows:

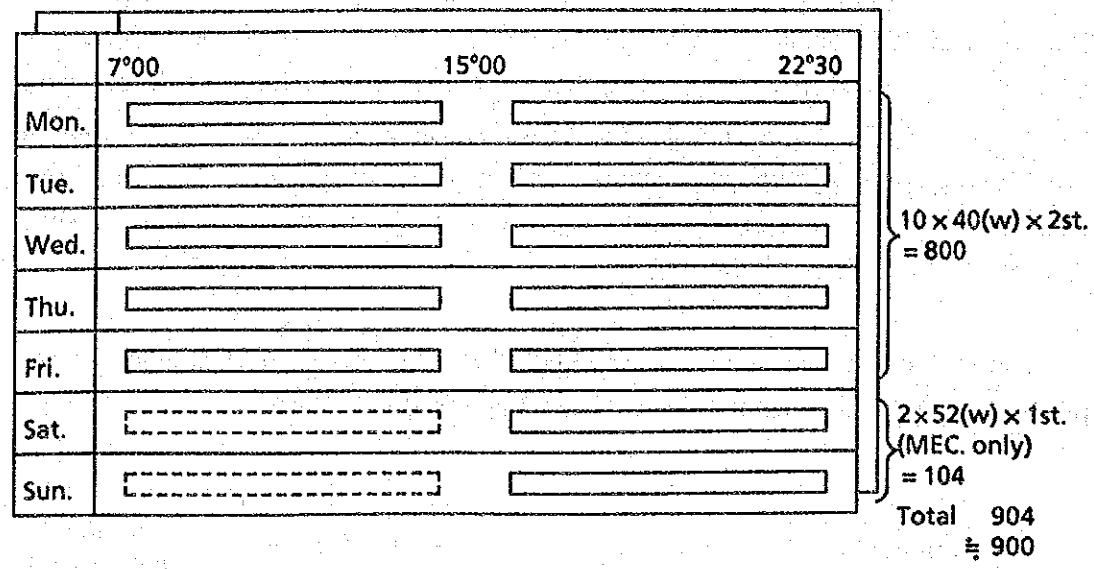
	1st		2nd		3rd	
PDs (including chief PDs)	(8)	→	(11)	→	15	(including 3 additional)
Studio Technical Crews	(10)	→	(20)	→	30	
Art Designers	(3)	→	(5)	→	7	
Production Assistants (OJT)	(4)	→	(6)	→	6	
TV Transmitter Engineers	(0)	→	(2)	→	4	
MCR 6 (3 × 2) × 365 ÷ 200	(0)	→	(2)	→	11	

(4) Introduction Phase (4th year)

The objective of this year is to promote the production capability in terms of quantity and quality of the programs, and at the same time, to accumulate the educational programs so that to enter smoothly to the succeeding practical full-scaled phase. When the practical regular broadcasting of the ETV programs is started, the number of the accumulated programs is at least 1,400. In order to realize this, during the later 2 years (4th and 5th of the introduction phase), the produced programs shall exceed the above 1,400 programs.

According to the programing plan shown in Table 3.2.5 of this report, the required program number is 640 in the 4th year and 800 in the 5th year, so that total 1,440 programs are to be made.

In the 4th year, for the required program number of 640, and the each PD's production span is 5 days (1 week), so that the required practical PD's number is 16 (640 prog. × 5 day ÷ 200 day/year). The weekly allocations of the 2 studios are required to be as follows.



During the previous phases, the production was limited only for 5 weekdays (Mon.~Fri.) and 40 week a year, namely 2 shifts × 5 day × 40 week/year × 2 studios = 800 programs. However, in this year, for producing News and Live-wide programs on every day including Saturday and Sunday shall be conducted in an experimental way. Since these live programs are not able to be accumulated, the actually required program productions are to be added on the above 640 program productions. And the PDs for these live programs shall also be added. Assuming that each live program produce's production span is 7 days, the additional live PD number is 7 × 365 ÷ 200 ≒ 12. But in the 4th year, since it is in an experimental operation, it is not necessary to prepare the full number of 12 from the beginning. Here, it is preferable to prepare about 10 PDs for the live program production.

The studio production expert crews shall be assigned to those live productions in studio, the number of crews shall correspond to the above 640 + 156 (3 days a week × 52 weeks) totaling 796, almost 800 program productions. To cope with these 800 productions, the necessary number of crews are to be 800 ÷ 200 = 4. It means that the total number of each expert of the studio production will be about 10 per. × 4 = 40 persons.

Summarizing the above, at the end of the 4th year, total number of the production and the transmitting staff of the production and the transmitting staff are increased as follows:

	1st		2nd		3rd		4th
PDs (for Package)	(8)	→	(11)	→	(15)	→	16
PDs (for Live)	(0)	→	(0)	→	(0)	→	10
Studio Technical Crews	(10)	→	(20)	→	(30)	→	40
Art Designers	(3)	→	(5)	→	(7)	→	9
Production Assistants (OJT)	(4)	→	(6)	→	(6)	→	8
TV Transmitter Engineers	(0)	→	(2)	→	(4)	→	5
MCR	(0)	→	(0)	→	(11)	→	18

(5) Introduction Phase (5th year)

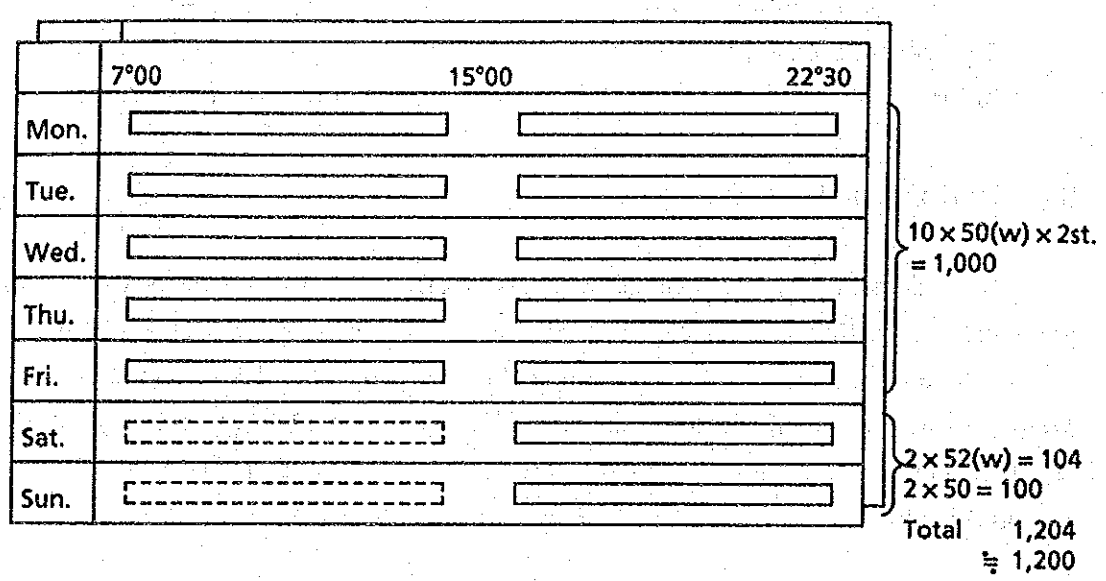
As mentioned in the preceding section (4), the required programs to be accumulated in this year is 800 with 20 PDs. (800 prog. = 20 PDs × 200days ÷ 5days) In addition to that, for practicing the live programs (News and Live-wide programs on everyday), further addition of live program PDs is necessary. Since the full number of PDs for such live production is 12 and already 10 PDs are engaged in the previous 4th year, 2 more PDs shall be added in this year.

In order to shift smoothly to the next Full-scale phase (6th year onward) in terms of the live programs which require daily practicing of the staff, the live program production shall be made and broadcast everyday (365 days production), so that the total number of studio in this year is 800 + 365 = 1,165. This requires the studio allocation almost in full capacity with no resting days on Saturday and Sunday and even in summer vacation season, which means also for the studio crews that they have to work in on-line working condition taking their vacations in turn.

Regarding the studio crews, since the required productions of this year are 1,165 and the maximum capacity of the 5 crews' working days are 5 crews × 200 days/year = 1,000 crews·days, it seems to be in short for the 1,165 productions of this year, however the actually needed studio crew number is 8~9 persons as mentioned in the previous section of (1), so that 10 - (8~9) = 1 or 2 persons are in surplus, of which working days are (1~2) per. × 5 crews × 200days/year = 1,000~2,000 per·days/year.

Therefore, for the surplus production of 165 (1,165 - 1,000), it can be done by the surplus number of studio staff working days of 1,000~2,000 per·days/year, because in the case of 8 persons for one crew, the surplus 2,000 per·days ÷ 8 per. = 250 productions can cope with the surplus productions of 165/year.

The full studio allocation is shown below.



As shown above, the maximum production capacity of the 2 studios is 1,200 which covers the above mentioned 1,165 productions of this year.

Although the required PDs for 800 package programs are 20 PDs and for the live programs, 12 PDs, total 32 PDs, 13 more new addition of PD is necessary, because, in the next Full-scale phase, PDs for General Programs on Saturday and Sunday become necessary, who have to be recruited in advance and be trained on OJT.

During this 5th year, installation works of studio equipment of the new EVT Center at ISE will be carried out by foreign engineers. Therefore, the studio engineers included in the studio expert crews shall be associated with the installation and adjustment works of the foreign engineers as far as possible, so that they will learn how to install and adjust the new studio equipment.

Also, in this year, some of the studio engineers and technicians will be trained during factory inspection period at the equipment manufactures. Therefore, 20 additional engineers and/or technicians shall be recruited for covering the reduction of crew's member and also for preparation of the next year's requirement of new staff for the new production facilities of the ETV center.

	1st		2nd		3rd		4th		5th
PDs (for Package)	(8)	→	(11)	→	(15)	→	(16)	→	20
PDs (for Live)	(0)	→	(0)	→	(0)	→	(10)	→	12
Studio Technical Crews	(10)	→	(20)	→	(30)	→	(40)	→	50
Art Designers	(3)	→	(5)	→	(7)	→	(9)	→	11
Production Assistants (OJT)	(4)	→	(6)	→	(6)	→	(8)	→	13
TV Transmitter Engineers	(0)	→	(2)	→	(4)	→	(5)	→	5
MCR	(0)	→	(0)	→	(11)	→	(18)	→	18
New Engineers & Technicians	(0)	→	(0)	→	(0)	→	(0)	→	20

(6) Full-scale Phase (6th year)

This year is the first operation of newly constructed ETV center at ISE site, so that various new practical operations of an Educational TV Station will be started such as productions of general programs on Saturday and Sundays using post production rooms and TV OB Van etc.

As mentioned in the Master Plan, Chapter 3 (Programming Plan), Table 3.4.8, Yearly Development Plan of Production and Necessary No. of PDs, the required total studio productions (or programs) in the 6th year is 965 with the 24 PDs (965 × 5 days ÷ 200 days/year). And the live program PDs for news and the "Wide Live" programs on every day are 12 PDs in addition to that, total 36 PDs are necessary for regular program productions. Since, up to the end of the previous 5th year 32 PDs (20 PDs for Package + 12 PDs for Live) and 13 assistant PDs, total 45 PDs are able to work as practically available PDs in this 6th year. The surplus 9 PDs (45 - 36 PDs) can be assigned for the general program productions by using the 2 post production rooms. Supposing that the production span of those PDs for general programs which will be broadcast mainly on Saturday and Sunday, is 5 days (1 week) although it seems to be short, as those production are utilizing already made programs such as Iberoamerica educational programs obtained from the TVRO, so that some simple post

productions required and/or some live programs of sport events taken by TV OB Van, etc., the productions do not take many days for the PDs.

(7) Full-scale Phase (7th year)

The operation of this year is almost the same with the previous 6th year in terms of the program production and the transmission as can be seen in the Table 4.4.1, since the operation in the ETV center will be in full scale.

One thing which differs from the previous year is that from this year, pre-production of programs for the succeeding Phase 2 according to the Programming Plan of the master plan shall be started, because by pre-producing the 2nd Phase programs in advance, the total production requirement can be kept evenly in a full operational manner, so that a smooth shift to the next phase 2 can be achieved.

(8) Full-scale Phase (8th year)

This year is the last year of the period of the Priority Project. The operations of this year will be almost constant for the program production as well as transmission. But, for the further development to more enriched programing for the succeeding phase, 5 more new PDs shall be recruited and also the number of the technical staff shall be gradually increased little by little as shown in the Table 5.1.2.

Table 5.1.1 Technical Staff Plan for the Full Scale Phase 1

	1~5th	6th	7th	8th
Director	1	1	1	1
Director (Production)	1	1	1	1
Director (Maintenance)	1	1	1	1
Master Control Room	(×2)	(×4)		
T. D. ×1 / Technicians ×3 / Operation of TX ×1 } 5	18 5	20	20	20
Studio Prod. (2 studios)	(×5)	(×5)		
T. D SW ×1 / Vi Engineer ×1 / Sound Mixer ×1 / Cameramen ×3 / Assist S. Mix ×1 / Assist Lighting ×1 } 9	10~50 (includin'g EFP & Edit. Maint. etc)	45	45	45
Post Production Room (2 Rooms)		(×2×1)	(×2×1.5)	
T. D SW ×1 / Sound Mixer ×1 } 2	(2)	4 →(+2) 6	→(+2) 8	
VTR Edit (2 Rooms)		(×2)		
VE ×1	(2)	2 →(+2) 4	4	
EFP Crew (4 Crews)	(×2)	(×2)	(×3)	(×4)
Cameramen ×1 / Light man ×1 } 2	(2)	4 →(+2) 6	→(+2) 8	
TV OB Staff				
T. D SW ×1 / VE ×1 / Cameramen ×3 / S ×1 L ×1 2 } 7	(7)	5 →(+1) 6	→(+1) 7	
Maintenance Staff				
Centerized M. (Prod) ×1	(1)	1	1	1
Centerized M. (TX) ×1	(1)	1	1	(+1) 2
Building facilities ×3	(3)	3	3	3
Local stations staff 3~4/station		8	8	8
Ciudad del Este, Encarnacion production 2×2				
	8→76 (+20)	96 (+7)	103	109

5.2 Maintenance Plans

Recent broadcasting equipment, particularly those used for the program production in the studios, have become remarkably compact as a result of adoption of ICs, and their reliability has been improved significantly. As for the transmitters, too, the replacement of the vacuum-tube system with full solid-state system using semiconductor elements has progressed, with the result that the transmitters have generally become extremely failure-free. However, even though the frequency of failures has become extremely low, once a failure occurs, the repair of electronic equipment requires extremely restricted and high-level know-how and repair techniques, making it considerably out of control of maintenance engineers of the users.

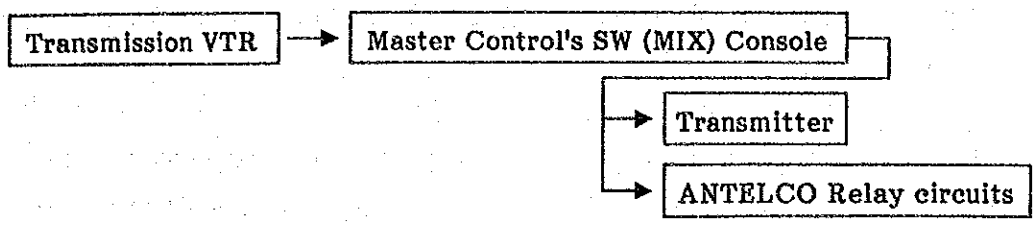
Generally speaking, in the industrialized countries including Japan, the range of failure repairs that can be coped with by the engineers of broadcasting stations is confined to the search for the units in trouble or the cause of the failure; the repairing of the failed units or equipment itself is actually commissioned to either the specialized agents or the equipment makers. This situation has already been going on for about 15 years, and this trend has been further accelerated as the broadcasting equipment continue to become more and more densely mounted and digitized.

Under these circumstances, it is of utmost importance to consider the best means of ensuring effective maintenance of broadcasting equipment relating to the educational TV broadcasting network in Paraguay so that high-quality programs may always be delivered to the nationwide viewers.

The first thing that needs to be constantly kept in mind is that interruption on suspension of broadcasting of programs in mid-course should never be permitted to occur. So, should such a suspension of service occur owing to equipment failure or any other reason, those in charge of transmission of programs should immediately take emergency measures, such as exchanging the failed equipment or unit with good ones or temporarily bypassing the failed sections of the equipment, to ensure that the cause of the trouble will be removed as soon as possible. Since such back-up operations by the operators in charge differ according to the actual content of the failure itself, it is of primary importance to consider all possible types of failures and to make sure

that those in charge of transmission work are routinely trained to become able to cope with any emergency case.

In the case of the present educational TV network in Paraguay, the transmission systems of the ETV Center in Asuncion in charge of transmissions operate as follows:



In coping with possible failures in the transmission VTRs, a single-VTR playback will be planned this time instead of the two-VTRs parallel playbacks, the system once adopted in the past, however, the reliability of the transmission VTRs has recently been enhanced remarkably. As a result, the need arises for very strict maintenance and reliability of the transmission VTRs together with the packaged VTR tapes. As the electronic broadcasting equipment have come to use semiconductors (LSIs or other solid-state circuits), the overall reliability of the broadcasting equipment is more and more uplevelled. Even so, it is very important for the engineers to be fully aware of the fact that the abrasion of the tips of VTR heads and the rubbing of the tapes by the head tips are still the few but major causes of deterioration in performance and reliability in the daily operation.

The life of VTR head tip is influenced significantly by the humidity of the room in which the equipment is used. Since the life of a VTR head-tip is sharply shortened by high humidity in the room, it is necessary to ensure that the room humidity is always held down below 60%. The life of a head tip is said to be 700-800 hours when the room humidity is 60%. The tips that have reached these hours of usage are required to be replaced with a new one. Since the exchanging of VTR head tips require jigs, measuring instrument and special techniques, commissioning of some outside specialist firms in Asuncion to undertake the exchanging work will be the method to be adopted by the broadcasting station. However, it is the responsibility of the engineer in charge to constantly keep an eye on the abrasion condition of the head tips and to ensure that an exchange

order is placed without fail with the outside repair firm as soon as a head tip is found to have approached the end of its life.

This applies also to the VTR tapes. Since the standard number of repetitive recording or playback uses of tape for a 1/2' component VTR is said to be 100 times, it is necessary for the engineer in charge to keep the records of the repeated uses of each VTR tape and to take such maintenance measures as excluding those tapes that have reached the limit in their usage from the stock for broadcast use.

With regard to the above-described transmission system, an emergency measure, such as directly patching inputs and outputs, may be considered to cope with a failure occurring within a transmission circuits.

As for the transmitters, there are possibilities of failures occurred owing to malfunctioning of various sections including the power source and the transmitter itself. Among these equipment, the TV transmitter was used to be with the lowest reliability in the past, but now the reliability has improved remarkably as a result of the shift; from those using vacuum tubes to those of solid-state composition. Hence, it is proposed that a single-transmitter system be adopted.

In the case of a recent solid-state transmitter, because of parallel composition of a number of transmitter amplifier unit, the total of outputs of all the units becomes the output of that transmitter. Therefore, in the case of a failure of one of the units, the trouble can be recovered by replacing that unit with a new one, as the failure is indicated by a lamp on the monitoring panel.

With regard to the managing of failures other than those mentioned above but are sometimes complicated or serious, it is extremely important for engineers in charge to be always prepared to cope with any emergency by getting immediately in contact with the consultants or the makers who have taken charge of this project.

For that purpose, it is essential to set up a centralized maintenance managing system. In this project, two 2-3 member groups -- one centralized maintenance manager group mainly in charge of the transmission system and one other centralized maintenance manager group in charge of studio production

and transmission system equipment -- will be organized. Both of these two groups have sufficiently high-level and wide-ranging skills and knowledge concerning their respective fields, so that they may always have a firm grasp of the overall operational conditions of the nation-wide network; in case of emergency including the occurrence of an equipment failure, they are constantly prepared to respond to the needs of going out to the regions to take emergency measures and, for that purpose, they also maintain close contact with foreign engineering organizations in charge of offering technical assistance.

The foregoing has been the outline of the on-line failure measures to be taken in relation to the transmission work. Besides the above, managements for the maintenance of the studio facilities that require periodical maintenance, such as the lighting equipment and studio floors, will also be conducted by the personnel in charge, in addition to taking measures to cope with the equipment failures that may occur at the time of production or videotaping of programs in the studio.

The items that require periodical maintenance or repair measures include the following:

- Repairing of the studio floors (once in 2-3 years, 2 weeks being required to complete a round of repairs)
- Cleaning and replacements of studio lighting equipment (once a year; taking a week each time)
- Repainting of the outdoor steel tower (once in 3 years)
- Maintenance of emergency power generation system for power failure -- to be checked once a month (once a year)
- Maintenance of the batteries (for use in Interrupted Power Supply) (once a year)
- Overhauling of the TV OB van (once in 2 years)

With regard to the above, it is of course of prime importance to secure the budget required for the maintenance works. But in addition to such budget, it is of absolute necessity for sustainable operation of a broadcasting station to secure the maintenance expense budget payable in foreign currencies, such as, in the case of damage of production equipment (such as EFP cameras, VTRs and outside-broadcast equipment), the expenses required in communicating with

outside firms including the foreign makers for the repairing of failed equipment, purchasing of spare parts and additional equipment units.

Generally speaking, the amounts of annual budgets to be secured to cover those maintenance expenses are said to be 3.0% of the total costs of the entire electronic equipment.

It is of utmost importance for the maintenance to ensure that repair expenses in such amounts as budgetted above will be ready to be disbursed anytime according to needs so as to enable taking necessary financial measures. Equally important is the fact that the broadcasting station should always be prepared to take necessary measures for execution of the budget, voluntarily and speedily, including payments in foreign currencies.

In Paraguay, the after-sales service system has not yet been sufficiently established by broadcasting equipment makers. Consequently, as mentioned in the section concerning the Facility Plan, full consideration should be given to ensure that maintenance and operation of broadcasting equipment can be conducted both efficiently and easily by purchasing the equipment as much as possible from the same maker and of the same model.

Such equipment makers normally have an after-sale service center in Paraguay and so the afore-mentioned centralized maintenance officers should conduct their maintenance work with full support of those service centers.

Supply of VTR Tapes

The VTR tapes packaged of complete programs for use in the educational TV broadcasts are to be stored in preparation for future rebroadcasts. Therefore, it is one of the important duties of the maintenance personnel to ensure, that enough number of raw VTR tapes are supplied and maintained properly to cope with the needs of recording the necessary number of programs to be produced each year.

CHAPTER 6 IMPLEMENTATION PLAN OF THE PRIORITY PROJECT

6.1 Target Date: end of Year 2001

Since the period of the Priority Project is from the 1st year to 8th year when Full-scale Phase 1 is completed. When the Project starts in 1994, the target date will be the end of year 2001.

6.2 Project Outline and Implementation Schedule

(1) In the 2nd year (1995), a transmitter station will be constructed on the premises of ISE in Asuncion. In the meantime, the existing studios at MEC and former IPT 3F will be provided with necessary supplement equipment.

(2) The period of five years before the commencement of Full-scale broadcasting (Phase 1) will be assigned for preparatory, experimental and introduction phases. At first, various councils and committees shall be set up, during this preparation period, and the production staff will be recruited and trained. Programs for Full-scale phase 1 will be produced in advance during the Introduction phase (4th and 5th year), enabling smooth transition to Full-scale broadcasting.

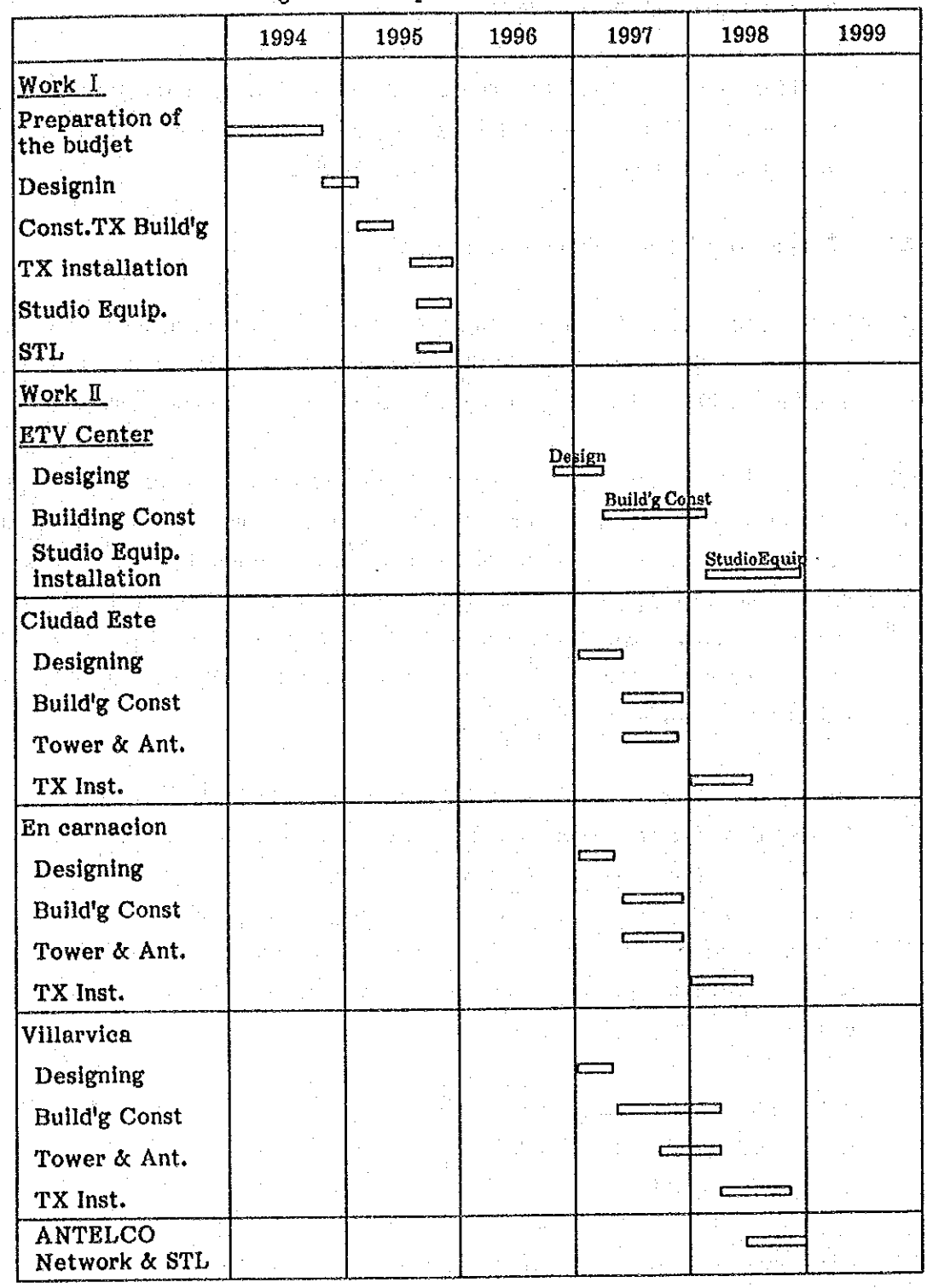
(3) During the introduction phase (4th and 5th year, 1997-1998), the new ETV Center (Educational TV Broadcasting Center) will be constructed on the ISE site. Regional transmitting stations will also be constructed in three major regional cities (Ciudad del Este, Encarnacion, Villarica).
In the meantime, it is necessary to get an agreement on the equitable usage of UHF Lower Band Channels (14ch ~ 20ch) with the neighboring countries.

(4) Full-scale broadcasting (Phase 1) will be operated at the ETV Center. By this stage, production and transmission arrangements will have been consolidated firmly.

(5) Broadcasts will cover 40% of the entire population after the construction work 1 during the 2nd year, and increased to 62% by the work 2 scheduled to be implemented during 4th to 5th year.

(6) Figure 6.1 shows the Construction work with the Implementation Schedule.

Figure 6.1 Implementation Schedule



6.3 Priority Project Implementation Body

A Joint corporation of MEC and ANTELCO.

6.4 Management Body

The management body of the educational Television Network is proposed to be a joint corporation of MEC and ANTELCO, with the legal status of an independent non-central government organization, eligible for substantial national funding. One of its example is National Asuncion University.

6.5 Costs of the Project

(1) Construction costs

The cost is estimated in a fixed price at 1993 based on the following conditions.

- Currency exchange rates of this estimation ;
  1 US $ = 120 yen = 1,700 Guraneis (Gs)
- Import tax of 10% of foreign portion is added to local portion.
- Engineering fees are 8% for civil work cost and 6% for broadcast equipment and electric equipment cost.
- Physical contingency of 10% is included in the building and tower construction costs.
- Price contingency is estimated 15% for local portion and 5% for foreign currency portion.

The estimated construction cost on the basis of above conditions, the costs of Work 1 and Work 2 necessary for the Priority project are shown is Table 6.1.

Table 6.1 Construction Cost of the Priority Project

Uunit : million Gs
: million US$

	Work 1	Work 2	Total
Local Portion	1,348.1 MGs (0.793M$)	13,083.2 MGs (6.667+1.029M$)	14,431.3 MGs (8.489M$)
Foreign Portion	6,585.8 MGs (3.874M$)	20,253.8 MGs (0.421+11.493M$)	26,839.6 MGs (15.788M$)
Total	7,933.9 MGs (4.667M$)	12,049.6MGs + 21,287.4MGs (7.088+12.522M$)	41,270.9 MGs (24.277M$)

(2) Investment Schedule

Table 6.2 shows Annual Investment Schedule of the Work 1 and Work 2 in detail.

Table 6.2 Annual Investment Schedule

	Year / Site	1994		1995		1996		1997		1998		1999		2000		2001	
		Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign
WORK I	Transmitter (Asuncion)																
	Building for TX			92													
	Tower			267													
	Ant. Feeder,Inst.				208												
	Power Supply				83												
	Transmitter (V10Kw)				500												
	Mini.Micro (SYL)×3				667												
	Production Equipment				1,917												
	VCR & Moni, etc.				67												
	IMPORT TAX			371													
	Engineering Fee				239												
	Physical Confingency			36	21												
	Price Contingency			27	172												
	(4,667)			(793)	(3,874)												
WORK II	ETV Center																
	Building							4,167									
	Engive Generator										542						
	Air-conditions,etc.							408									
	Studio Facility										6,250						
	TV OB van										750						
	(12,117)							(4,575)			(7,542)						
	Ciudad del Este																
	Building							50									
	Tower							8									
	Ant. Feeder,Inst.										208						
	Power Supply										83						
	Transmitter (U10Kw)										583						
	(932)							(58)			(874)						
	Encarnacion																
	Building							33									
	Tower							200									
	Ant. Feeder,Inst.										208						
	Power Supply										83						
	Transmitter (U10Kw)										583						
	(1,107)							(233)			(874)						
	Villarrica																
	Building							200									
	Tower							292									
	Ant. Feeder,Inst.										167						
	Power Supply							8			83						
	Transmitter (U10Kw)										500						
	Mini Micro (STL)										250						
	(1,500)							(500)			(1,000)						
	Import Tax							363		1,029							
	Engineering Fee								421		636						
	Physical Confingency							495			58						
	Price Contingency							443			515						
	(3,995)							(1,301)	(421)	(1,029)	(1,203)						
TOTAL	(24,277)			793	3,374			6,667	421	1,029	11,493						

CHAPTER 7 PROJECT EVALUATION

7.1 Economic Viability of the Priority Project

7.1.1 Target of the Analysis

The main pillar of the Project is the utilization of television broadcasting in the Government's efforts to improve education. Assuming that educational broadcasting will significantly contribute to the improvement of the current educational situation in Paraguay and to the achievement of a desirable learning level for various types of education, the analysis has been conducted on the educational efficiency of television broadcasting compared to the present level of efficiency.

The target of the analysis is set on school education broadcasting for primary schools, which is the major part of the Priority Project.

7.1.2 Objective and Method of the Analysis

The objective of this analysis is to figure out the monetary portion of school education broadcasting as a method of raising up the efficiency in the Primary school education.

Currently there are substantial numbers of drop-outs and repeaters in the primary level education, and cause additional cost to produce graduates.

The analysis is an examination of cost and contribution of school education broadcasting as utilized in the improvement of school education.

The concept of the analyst is illustrated in Figure 7.1.2.1, and analysis flow is shown in Figure 7.1.2.2.

Figure 7.1.2.1 Concept of the Analysis

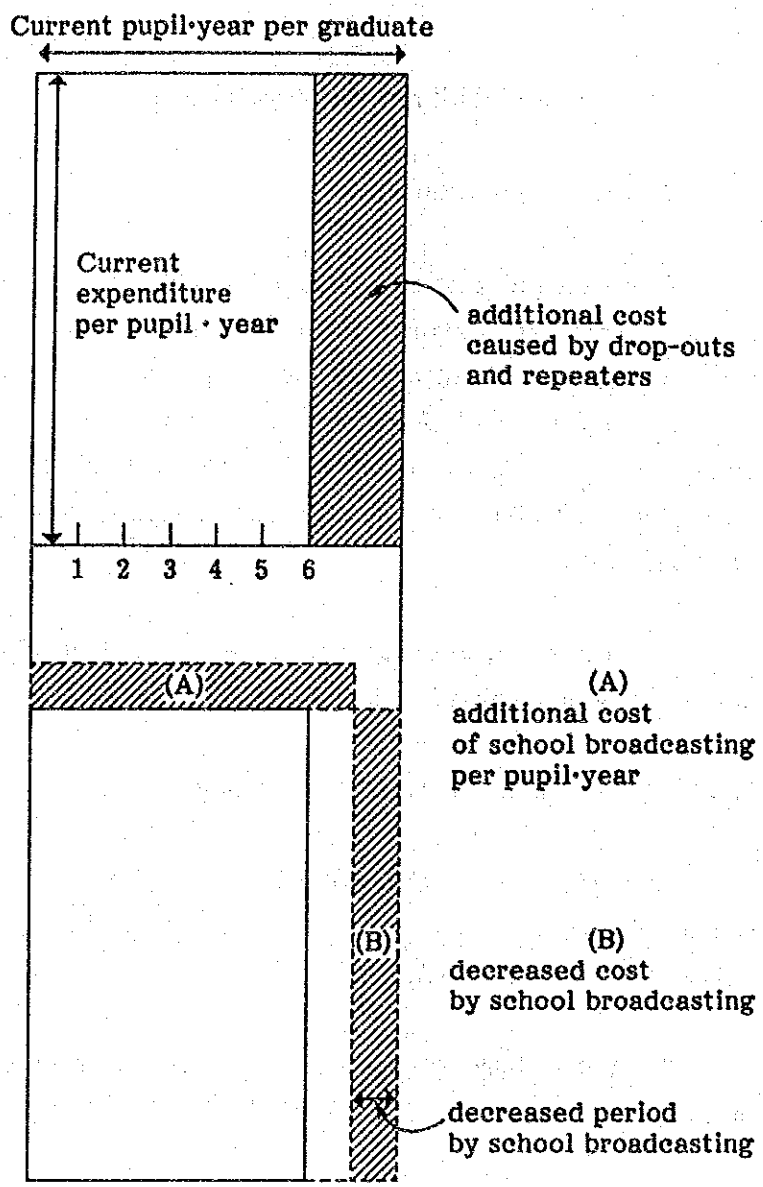
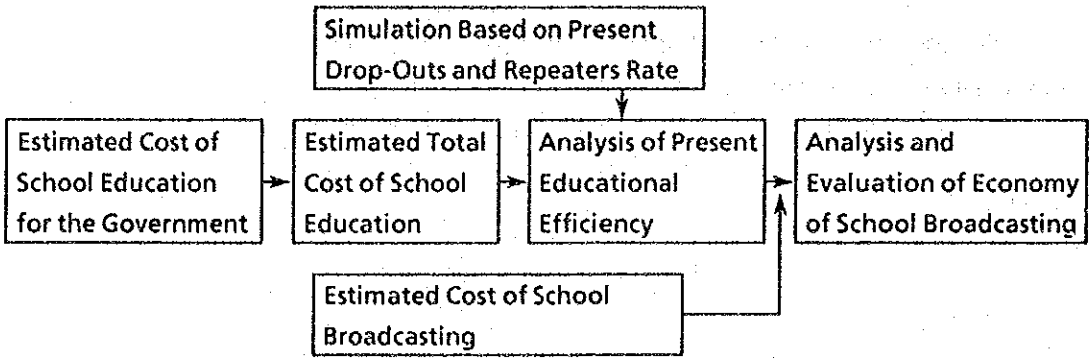


Figure 7.1.2.1 Analysis Flow



7.1.3 Estimate of Present Educational Cost

The present educational cost consists of public education expenditure from the government budget and the private cost required for the use of public education services. Public expenditure on education includes wages for teachers and other staff, the maintenance cost and the cost of teaching equipment and materials, etc., while the private cost includes the cost of school items, transport cost, meal cost and others.

(1) Estimate of Public Education Expenditure

The public education expenditure per pupil for one year in official schools is US$87 as shown in Table 7.1.3.1 which is calculated on the basis of the budgetary appropriation by the MEC. The conditions for calculation are as follows.

Number of Pupils : 720,983 (620,000 at official schools)
Average Number of Pupils/Classroom : 45

Table 7.1.3.1 Unit Cost of Public Education Expenditure for the Primary Level in Official School (1991)

MEC's budget for primary education	66,988	million Guarani
Share of administration cost of MEC	2,118	
Transfer to private schools	7	
Number of students enrolled	620	thousands persons
MEC's budget for teacher training	1,321	distributed at the portion number of
Share of administration cost of MEC	42	students in teacher training institutes
Ratio of public school students to the total	0.86	
MEC's budget per student-year	113,341	Guarani
	87	US$, $1=Gs.1300

(2) Estimate of Household Education Expenditure

There is currently no accurate data on household education expenditure except for the findings of a survey conducted in 1975 on the total education expenditure. The report for the said survey listed the items of household education expenditure as school items, transport and meals, etc. As these costs are still, in principle, met by the families of pupils, the current ratio of the private funding of the educational cost in the total cost and the actual amount of expenditure are seemed to be similar to those in 1975. As a result, data contained in the above report were used for the present analysis.

Table 7.1.3.2 Household Expenditure and Total cost for the Primary Level in Official School (1991)

Cost of school building & facility per class	24	million Guarani
Number of students per class	45	persons
Cost of school building & facility per student·year	17,630	Guarani, 30 years duration are supposed
Share of private contribution to total cost	0.50	according to the study in 1975
Private contribution per student·year	130,970	
Total cost per student·year	261,940	Guarani
	201	US$, $1=Gs.1300

(3) Total Cost of Education

Assuming that the cost of education at private schools vis-a-vis state schools has not changed since 1975, the per capita cost of education at private schools was calculated. The weighted average cost of school education per pupil·year is given in Table 7.1.3.3.

Table 7.1.3.3 Unit Cost of Education for the Primary Level (1991)

	Primary	
Ratio of unit cost for student in private school to that for student in official schools	1.48	according to the study in 1975
Total cost per student·year in private schools	387,672	Guarani
	298	US$, $1=Gs.1300
Total cost per student·hour in private schools	541	Guarani
	0.416	US$, $1=Gs.1300
Average unit cost per student·year	279,543	Guarani
	215	US$, $1=Gs.1300

7.1.4 Current Efficiency

The low level of educational efficiency, a prominent problem of primary education in Paraguay, is largely caused by the high drop-out rates and high repetition rates. Table 7.1.4.1 shows the promotion, repetition and drop-out ratios for primary and secondary education estimated by the UNESCO office for the period between 1990 and 1991.

Table 7.1.4.1 Current Educational Indicators at the Primary Level

	Promotion Ratio	Repetition Ratio	Drop-out Ratio
1st Grade	69.7%	26.4%	3.9%
2nd Grade	70.6%	22.5%	6.9%
3rd Grade	69.4%	23.3%	7.3%
4th Grade	65.2%	22.9%	11.9%
5th Grade	54.5%	26.9%	18.6%
6th Grade		40.5%	14.9%

The results of the simulation using the figures given in Table 7.1.4.2 indicate that educational resources equivalent to 6,448 pupils·year, i.e. the amount of educational resources required to educate 6,448 pupils for one year, are required to produce 827 successful primary school leavers from the original 1,000 (the educational resources required to educate 1,000 pupils for a period of 6 years amount to 6,000 pupil·year which is the ideal figure indicating that all 1,000 pupils have completed 6 years of primary education). This also means that one successful primary school leaver requires 7.80 year equivalent of educational investment instead of 6 years. The additional cost of education to cover the extra learning is calculated below.

$$\$215/\text{year} \times (7.80 \text{ years} - 6 \text{ years}) = \$387/\text{successful school leaver}$$

On average, an additional cost of $387 is required to ensure one successful primary school leaver (Figure 7.1.6.1).

Table 7.1.4.2 Theoretical Students Flow at the Primary Level with Historical Tendency

Year	Age	New Pupil							Total
		Pupils	1st grade	2nd grade	3rd grade	4th grade	5th grade	6th grade	
1993	7	1,000	1,000	0	0	0	0	0	1,000
1994	8	0	264	697	0	0	0	0	961
1995	9	0	70	341	492	0	0	0	903
1996	10	0	18	125	355	342	0	0	840
1997	11	0	5	41	171	325	223	0	765
1998	12	0	1	13	69	193	272	121	669
1999	13	0	0	4	25	92	199	197	517
2000	14	0	0	1	8	38	114	188	350
2001	15	0	0	0	3	15	56	138	211
2002	16	0	0	0	1	5	25	86	117
2003	17	0	0	0	0	2	10	48	60
2004	18	0	0	0	0	1	4	25	30
2005	19	0	0	0	0	0	1	12	14
2006	20	0	0	0	0	0	1	6	6
2007	21	0	0	0	0	0	0	3	3
2008	22	0	0	0	0	0	0	1	1
2009	23	0	0	0	0	0	0	0	1
	Total		1,359	1,222	1,125	1,012	903	827	6,448

7.1.5 Estimate of School Broadcasting Cost

In order to compare the additional cost of education (387$) discussed in (3) above, the educational cost at primary school was calculated as follows.

a) The personnel cost, equipment repair cost, electricity cost, microwave network service charge and administrative cost were proportionally determined based on the ratio of broadcasting hours for primary schools in the total number of broadcasting hours.

b) The program production cost for school broadcasting for the primary level were calculated independently.

c) The ratio of the school broadcasting hours in the total number of broadcasting hours is shown in Table 7.1.5.1.

d) The number of the pupils benefiting from educational broadcasting was determined based on data provided by UNESCO and by multiplying the coverage rate of population.

e) Although the Project assumes the provision of a TV set at every school as a precondition for school broadcasting, the cost of such provision must be calculated as part of the overall school education broadcasting cost. The basis for calculation is the provision of 1.5 TV sets at each school costing 1,000 US dollars for 10 years use, including the cost of installation, and maintenance (3% annually). Based on the assumption that the number of pupil in a school in the future will be the same as present, the number of schools provided with a television set was calculated by multiplying the total number of schools by the ratio of pupils subject to school broadcasting.

Table 7.1.5.1 Weekly Broadcasting Hours by Program Plan

(In minutes)

	Week Days	Sat.&Sun.	Weekly	Weekly Share
Primary School Broadcasting	200	180	1,180	36.8%
for Teacher Training	40		200	6.2%
for Socially Weak	90	150	600	18.7%
Public Information	60	90	390	12.1%
for General Public	120	240	840	26.2%
Total	510	660	3,210	100.0%

Table 7.1.5.2 Annual Cost of School Broadcasting for Primary School (in thousand US$)

Production Cost	210
Share of Other Cost	2,314
Total	2,524

Table 7.1.5.3 Broadcasting Coverage (Enrollment: in thousand)

Coverage	62%
Total Enrollment	942
Coverad Pupils	584

Table 7.1.5.4 Annual Cost of TV Installation (in thousand US$)

Covered Pupils	584
Covered Schools	3,666
Number of TV installed	5,499
TV Installation Cost	715

Table 7.1.5.5 Unit Cost of School Broadcasting for Primary Schools

Annual Cost	3,239	thousand US$
Covered Pupils	584	thousand
per Pupil · Year (US$)	5.5	US$

The annual cost for utilization of broadcasting for primary schools are US$ 3,239 thousand. The unit cost of school broadcasting calculated on the basis of the above assumption is estimated US$ 5.5.

7.1.6 Analysis Results

The analysis results are summarized below.

a. The current input of educational resources to produce one successful primary school leaver is 7.80 pupils·year which is 1.8 pupil·year above the ideal situation in which everyone completed primary school in 6 years. The educational cost to cover 7.80 pupils·year is $1,677 ($215/year × 7.80 years). (Figure 7.1.6.1)

b. The cost of school broadcasting is expected to be approximately $5.5/pupil·year in 2001.

The addition of a new measure to the educational system with the purpose of making all pupils complete primary education in the standard 6 years has the following economic significance. The figure of $1,677 indicates the maximum level of investment permissible under the Project. Any excess above this level under the Project means that other measures are economically more advantageous.

Based on the following equation, the annual cost of improvement must be up to $64.5/pupil year.

(Annual Cost of Improvement/Pupil) × 6 years ≦ $387

As the annual school broadcasting cost is $5.3/pupil, it satisfies the above condition. However, correlation between the input and effect (degree of target attainment) is unclear. To clarify the situation, the longest period permissible with additional investment of $5.5/pupil year is calculated as follows.

$$(\$215 + \$5.5)\,(6 + \alpha) \leqq \$1,677$$

$$\alpha = 1.61$$

The investment of $5.5/pupil·year may not make all pupils complete primary education in 6 years, but should improve 2.5% ((7.80 - 7.61) / 7.61 = 2.5%, Figure 7.1.6.2)

An efficiency level of 7.61 pupil·year can be achieved by lowering the repetition ratio by 4 points for all grade or by lowering the drop-out ratio by a mere 0.35 points.

Some data shows that 10 minutes session of computer assisted instruction (CAI) in every day added 12% of annual achievement of conventional education in arithmetic or 23% in reading capability to pupils in primary schools in the United State in late 1970's.

Data on quantitative analysis of effect comparison among educational media or method are quite limited and cannot be easily generalized because the effect of educational media is different depending upon each tradition and social environment. Moreover, quality of arrangement, such as quality of program or enthusiasm of teachers who utilize each media will give large impact on the effect

With educational television broadcasting 2.5% of improvement can be achieved where teaching materials and equipment is not sufficient, learning hours are not enough if well-prepared programs broadcast and systematic assist for utilization by teacher who might not have required professional skills.

Even though this analysis, having many preconditions and Assumptions, might not draw a definitive conclusion, the introduction of school broadcasting at primary level could be regard as valid from economic viewpoint.

Figure 7.1.6.1 Current Additional Cost for a Graduates in Primary School

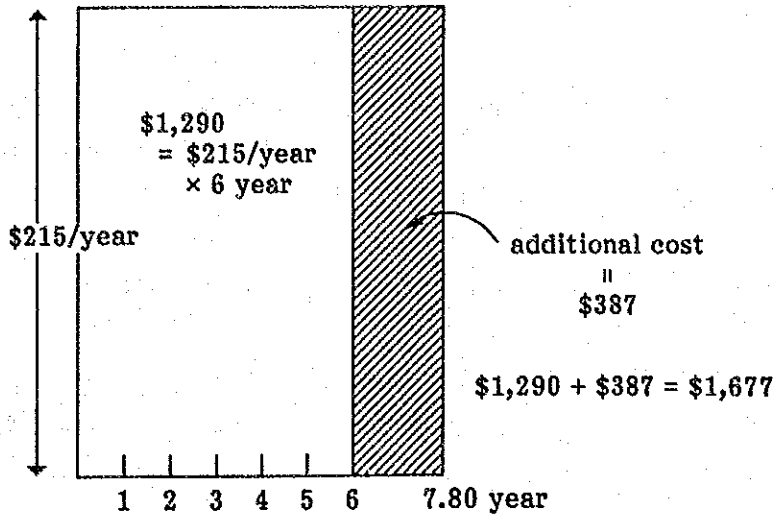
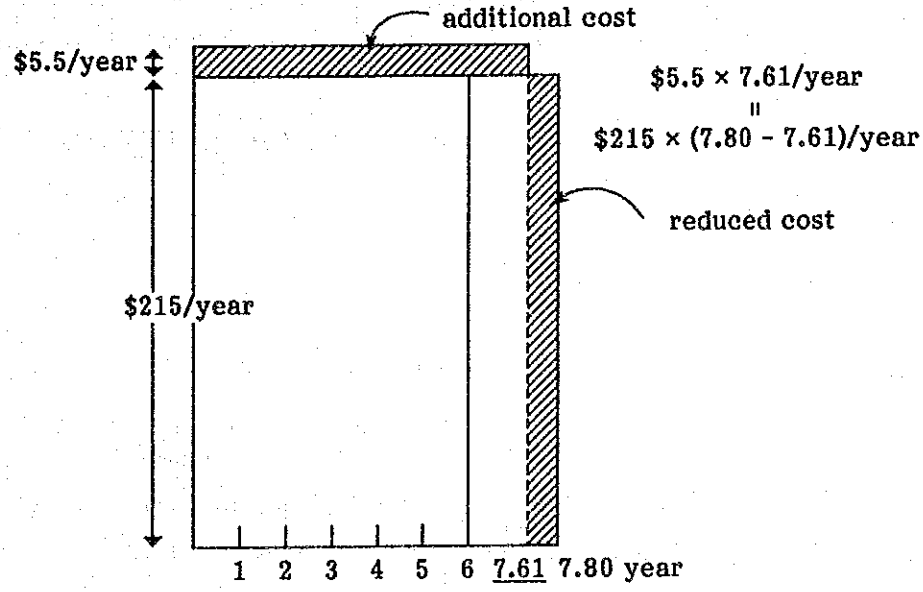


Figure 7.1.6.2 Permissible Longest Year with School Broadcasting



7.2 Financial Analysis

7.2.1 Introduction

In the financial analysis of the Master Plan, the scale of advertisement income is estimated and required subsidy from National Treasury is estimated for filling the gap between the expense and advertisement income. Appropriateness and possibility are assessed on subsidizing from National Treasury for financing the educational broadcasting entity.

The Priority Project is selected as the first step to implement the Master Plan. The Priority Project cannot be financially assessed apart from the whole of the Master Plan.

Target period of the analysis is the period of execution of the Priority Project, form preparatory phase to full-scale phase 1. The analytical flow of the analysis is as follows.

- To arrange the financial plan for the broadcasting entity.
- To clarify the financial condition based on the estimated advertisement income and cost for construction, operation and financing.
- To estimate the amount of the subsidy (transfer budget) from National Treasury.

7.2.2 Revenue and Cost

(1) Budget of the Government (Transfer Budget)

The transfer budget is a part of the government budget applied and appropriated though the MEC and the MOPC to the broadcasting entity. The budget is allocated in single fiscal year of the Government.

(2) Advertisement Income

Advertisement income consists of public advertisement and commercial advertisement. Revenue from advertisement is estimated in the financial analysis of the Master Plan under the condition set on broadcasting hours and

unit charge of advertisement. The amount of advertisement income estimated for Full-Scale 1 in the Master Plan study is applied in this analysis.

(3) Total Investment Cost

Conditions and the result of estimated investment cost are described in the previous chapter.

(4) Conditions of Financing for Investment

For the analysis, foreign currency portion of the construction cost, 65% of the total investment, is assumed to be financed with long term loan. For local currency portion, 35% of the total the government budget (transfer budget) is supposed to be appropriated though the MEC and the MOPC.

Loan conditions for the long term loans are supposed as 25 years' repayment, including 5-yera grace-period and equal repayment for the principal. As for interest rate, two cases, Case-1; 5% and Case-2; 10%, are applied in the analysis.

7.2.3 Implement Entity and Its Financial Plan

(1) Implementing Entity

Implementing body is to be a national broadcasting entity established with fund from the Government and operated as an autonomous decentralized entity with subsidy from the Government.

The entity, an example of this type of organization is National University of Asuncion, is independents in operation. Financial characteristics of the entity are, unlike directorates or departments of ministries, to have a certain revenue. Budget appropriation for the entity is conducted after estimation of its revenue and operation expense and calculation of the gap between revenue and expense. Transfer budget is appropriated to fill the gap.

Another possible type of organization for the broadcasting entity might be a public corporation, an example of this type of organization is ANTELCO. Public corporation is a self-financing body for its investment, operation and

reinvestment. A public cooptation formulates its budget by its own judgment and receives no subsidy as a rule, although the budget should be submitted for the approval of the congress and in case of a change of the approved budget, an important change such as in capital investment is subject to be approved.

The broadcasting body cannot be a public corporation during the target period of this analysis with the advertisement income estimated in the financial analysis of the Master Plan, even though there will be some merits for its operation if the broadcasting body becomes a public corporation.

(2) Financial Plan and Development Phase

1) Preparatory Phase

In this phase, the preparation for the establishment of the broadcasting body is to be carried out mainly by the MEC. For this period, financial source is the budget of the MEC.

2) Experimental and Introduction Phase

After legal arrangement, established broadcasting entity will depend its financial structure upon transfer budget of the Government thorough MEC and MOPC. Investment from ANTELECO is another possible source of finance.

3) Full-Scale Phase

Revenue from advertisement broadcasting will be one of the financial soureses from this phase. Since advertisement income will not grow enough to meet all operating expense and financial cost for long term loan, deficits in balance will be filled by budget transfer through the above two ministries or investment by ANTELCO.

7.2.4 Financial Analysis

(1) Financial Projections

Based on the above conditions and the financial plan, the following financial have been prepared for the target period of the analysis.

a. Profit/Loss Statements

b. Source and Application Statements (Chase Flow)

Cases for the analysis are summed as follows.

Table 7.2.4.1 Cases set for the Analysis

	Interest of Long Term Loan	Annual Advertisement Income (thousand US$)
Case 1-A	5%	3,217
Case 1-B	5%	5,361
Case 2-A	10%	3,217
Case 2-B	10%	5,361

(2) Profit/Loss Statements

Profit/Loss Statements are prepared for the target period of the analysis as Table 7.2.4.2~Table 7.2.4.5. Only operating income appears in the statements to show the financial conditions of the broadcasting entity.

(3) Source and Application Statements

Source and Application Statements are projected during the period as Table 7.2.4.6~7.2.4.9. In the statements, sources of fund comprise net profit, depreciation, long term loan for foreign currency portion of construction cost, government fund for local currency portion of construction cost and subsidy from the Government to balance the flow. On the other hand, application of funds consist of construction cost, repayment of principal of foreign loan.

Table 7.2.4.2 Profit/Loss Statements of the Broadcasting Entity
(Unit: thousand US$) (Case 1-A)

	1994	1995	1996	1997	1998	1999	2000	2001
1. Operating Income								
Advertisement Charge						3,217	3,217	3,217
2. Operating Expense								
- Personnel Expenditure	219	386	726	1,015	1,310	1,586	1,586	1,586
- Program Production Cost	20	64	192	412	605	1,587	1,631	1,631
- VTR Tape Cost	4	13	38	51	48	60	67	67
- Microwave Network Tarff						124	124	124
- Electricity Charge			4	4	4	10	10	10
- Maintenance Cost			96	96	96	381	381	381
- Administration Cost	24	89	148	223	393	562	571	655
Total	268	552	1,204	1,801	2,455	4,309	4,370	4,453
3. Profit/Loss before depreciation	Δ 268	Δ 552	Δ 1,204	Δ 1,801	Δ 2,455	Δ 1,092	Δ 1,153	Δ 1,236
4. Depreciation								
- Buildings and Towers		25	25	245	270	270	270	270
- Machinery, Equipment		7	7	40	104	104	104	104
- Electric Equipment		381	381	381	1,460	1,460	1,460	1,460
Subtotal		413	413	666	1,835	1,835	1,835	1,835
5. Operating Profit/Loss	Δ 268	Δ 965	Δ 1,617	Δ 2,467	Δ 4,290	Δ 2,927	Δ 2,988	Δ 3,071
6. Interest on Long Term Loan		194	194	215	789	789	780	770
7. Net Profit/Loss	Δ 268	Δ 1,159	Δ 1,811	Δ 2,682	Δ 5,079	Δ 3,717	Δ 3,768	Δ 3,841

Table 7.2.4.3 Profit/Loss Statements of the Broadcasting Entity
(Unit: thousand US$) (Case 1-B)

	1994	1995	1996	1997	1998	1999	2000	2001
1. Operating Income								
Advertisement Charge						5,361	5,361	5,361
2. Operating Expense								
- Personnel Expenditure	219	386	726	1,015	1,310	1,586	1,586	1,586
- Program Production Cost	20	64	192	412	605	1,587	1,631	1,631
- VTR Tape Cost	4	13	38	51	48	60	67	67
- Microwave Network Tariff						124	124	124
- Electricity Charge			4	4	4	10	10	10
- Maintenance Cost			96	96	96	381	381	381
- Administration Cost	24	89	148	223	393	562	571	655
Total	268	552	1,204	1,801	2,455	4,309	4,370	4,453
3. Profit/Loss before depreciation	Δ 268	Δ 552	Δ 1,204	Δ 1,801	Δ 2,455	1,052	991	908
4. Depreciation								
- Buildings and Towers		25	25	245	270	270	270	270
- Machinery, Equipment		7	7	40	104	104	104	104
- Electric Equipment		381	381	381	1,460	1,460	1,460	1,460
Subtotal		413	413	666	1,835	1,835	1,835	1,835
5. Operating Profit/Loss	Δ 268	Δ 965	Δ 1,617	Δ 2,467	Δ 4,290	Δ 783	Δ 844	Δ 927
6. Interest on Long Term Loan		194	194	215	789	789	780	770
7. Net Profit/Loss	Δ 268	Δ 1,159	Δ 1,811	Δ 2,682	Δ 5,079	Δ 1,573	Δ 1,624	Δ 1,697

Table 7.2.4.4 Profit/Loss Statements of the Broadcasting Entity
(Unit: thousand US$) (Case 2-A)

	1994	1995	1996	1997	1998	1999	2000	2001
1. Operating Income								
Advertisement Charge						3,217	3,217	3,217
2. Operating Expense								
- Personnel Expenditure	219	386	726	1,015	1,310	1,586	1,586	1,586
- Program Production Cost	20	64	192	412	605	1,587	1,631	1,631
- VTR Tape Cost	4	13	38	51	48	60	67	67
- Microwave Network Tariff						124	124	124
- Electricity Charge			4	4	4	10	10	10
- Maintenance Cost			96	96	96	381	381	381
- Administration Cost	24	89	148	223	393	562	571	655
Total	268	552	1,204	1,801	2,455	4,309	4,370	4,453
3. Profit/Loss before depreciation	Δ 268	Δ 552	Δ 1,204	Δ 1,801	Δ 2,455	Δ 1,092	Δ 1,153	Δ 1,236
4. Depreciation								
- Buildings and Towers		25	25	245	270	270	270	270
- Machinery, Equipment		7	7	40	104	104	104	104
- Electric Equipment		381	381	381	1,460	1,460	1,460	1,460
Subtotal		413	413	666	1,835	1,835	1,835	1,835
5. Operating Profit/Loss	Δ 268	Δ 965	Δ 1,617	Δ 2,467	Δ 4,290	Δ 2,927	Δ 2,988	Δ 3,071
6. Interest on Long Term Loan		387	387	430	1,579	1,579	1,560	1,540
7. Net Profit/Loss	Δ 268	Δ 1,353	Δ 2,005	Δ 2,896	Δ 5,869	Δ 4,506	Δ 4,547	Δ 4,611

Table 7.2.4.5 Profit/Loss Statements of the Broadcasting Entity
(Unit: thousand US$) (Case 2-B)

	1994	1995	1996	1997	1998	1999	2000	2001
1. Operating Income								
Advertisement Charge						5,361	5,361	5,361
2. Operating Expense								
- Personnel Expenditure	219	386	726	1,015	1,310	1,586	1,586	1,586
- Program Production Cost	20	64	192	412	605	1,587	1,631	1,631
- VTR Tape Cost	4	13	38	51	48	60	67	67
- Microwave Network Tarff						124	124	124
- Electricity Charge			4	4	4	10	10	10
- Maintenance Cost			96	96	96	381	381	381
- Administration Cost	24	89	148	223	393	562	571	655
Total	268	552	1,204	1,801	2,455	4,309	4,370	4,453
3. Profit/Loss before depreciation	Δ 268	Δ 552	Δ 1,204	Δ 1,801	Δ 2,455	1,052	991	908
4. Depreciation								
- Buildings and Towers		25	25	245	270	270	270	270
- Machinery, Equipment		7	7	40	104	104	104	104
- Electric Equipment		381	381	381	1,460	1,460	1,460	1,460
Subtotal		413	413	666	1,835	1,835	1,835	1,835
5. Operating Profit/Loss	Δ 268	Δ 965	Δ 1,617	Δ 2,467	Δ 4,290	Δ 783	Δ 844	Δ 927
6. Interest on Long Term Loan		387	387	430	1,579	1,579	1,560	1,540
7. Net Profit/Loss	Δ 268	Δ 1,353	Δ 2,005	Δ 2,896	Δ 5,869	Δ 2,362	Δ 2,403	Δ 2,467

Table 7.2.4.6 Source and Application Statements of the Broadcasting Entity
(Unit: thousand US$) (Case 1-A)

	1994	1995	1996	1997	1998	1999	2000	2001
CASH BALANCE, BEGINNING	0	0	0	0	0	0	0	0
CASH INFLOW								
• Net Profit	-268	-1,159	-1,811	-2,682	-5,079	-3,717	-3,768	-3,841
• Depreciation		413	413	666	1,835	1,835	1,835	1,835
• Foreign Loan		3,874		421	11,494			
• Government Fund for Investment		792		6,667	1,029			
• Subsidy to balance Cash Flow	268	746	1,398	2,016	3,245	1,882	2,127	2,200
- Total Subsidy	268	1,538	1,398	8,683	4,274	1,882	2,127	2,200
Total Cash Inflow	0	4,666	0	7,088	12,523	0	194	194
CASH OUTFLOW								
• Capital Expenditure								
- Foreign		3,874		421	11,494			
- Local		792		6,667	1,029			
• Amortization of Foreign Loans								
- Principal							194	194
Total Cash Outflow	0	4,666	0	7,088	12,523	0	194	194
NET CASH INFLOW	0	0	0	0	0	0	0	0
CASH BALANCE END	0	0	0	0	0	0	0	0
ACCUMULATED SURPLUS (DEFICIT)		-3,874	-7,748	-7,748	-8,169	-19,663	-19,469	-19,276

Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)
Interest Rate 5%

Table 7.2.4.7 Source and Application Statements of the Broadcasting Entity
(Unit: thousand US$) (Case 1-B)

	1994	1995	1996	1997	1998	1999	2000	2001
CASH BALANCE, BEGINNING	0	0	0	0	0	0	262	280
CASH INFLOW								
• Net Profit	-268	-1,159	-1,811	-2,682	-5,079	-1,573	-1,624	-1,697
• Depreciation		413	413	666	1,835	1,835	1,835	1,835
• Foreign Loan		3,874		421	11,494			
• Government Fund for Investment		792		6,667	1,029			
• Subsidy to balance Cash Flow	268	746	1,398	2,016	3,245	0	0	56
- Total Subsidy	268	1,538	1,398	8,683	4,274	0	0	56
Total Cash Inflow	0	4,666	0	7,088	12,523	262	211	194
CASH OUTFLOW								
• Capital Expenditure								
- Foreign		3,874		421	11,494			
- Local		792		6,667	1,029			
• Amortization of Foreign Loans								
- Principal							194	194
Total Cash Outflow	0	4,666	0	7,088	12,523	0	194	194
NET CASH INFLOW	0	0	0	0	0	262	17	0
CASH BALANCE END	0	0	0	0	0	262	280	280
ACCUMULATED SURPLUS (DEFICIT)		-3,874	-7,748	-7,748	-8,169	-19,401	-19,190	-18,996

Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)
Interest Rate 5%