

Generally, the production in the P.P. Room will take 3-5 hours of work, but it may take 1-2 days depending on the program contents.

The types of operations conducted in this post production room as outlined above normally require two specialist engineers, a TD-SW who can give technological support to the producer and to the program and an audio mixer, production work that involves commentaries using computer graphics.

Due to the 2 P.P. Room, the technical staff crew needed is  $2 \times 2 = 4$  crews, namely 2 PERSONS/CREW  $\times$  4 crews = 8 persons.

(c) VTR Editing Room (2 rooms) and Required Staff

As in the case of the post production rooms, one video engineer must be assigned to give technological support to the producer in the VTR editing work.

(d) EFP and the Required Personnel

In addition to the videotaping work in the studios, a TV broadcasting station must undertake so-called VTR location work. Such VTR location work, or EFP (Electronic Field Production) work, is often conducted for the purpose of obtaining video material of outdoor scenes for insertion into a program. For such EFP activities, it is necessary to send a crew, along with a producer in charge, out from the station on a location trip. Based on the programming and facilities plans, development of four crews will ultimately be necessary, each crew consisting of two members: one cameraman and one technician who will be in charge of both lighting and audio. This means that a total of eight persons will be necessary each year. Further increases in the number of crews and crew members will have to be considered to keep pace with the expansion of the programming plans.

(e) TV OB Van and Required Personnel

For TV coverage of various events taking place outside the broadcasting station, either indoors or outdoors, such as sports, lectures and theatrical plays, the TV OB (outside broadcast) vans are normally used. To operate a TV OB Van, at least one TD-SW, two video engineers, two cameramen, one lighting technician and one person in charge of audio are required as members of the engineering staff. However, since on-site TV broadcasts are not conducted daily, measures can be taken on a case-to-case basis to meet the requirements for additional staff to operate an OB Van according to the scale of the TV relay operation being planned. For example, reserve staff of the studio production engineering team or newly-employed staff in training can be used when needed.

The OB Van personnel are normally required to operate at a place where, unlike a studio, there is scarcely any system or equipment for TV coverage or production use. They must always set up TV coverage and shooting equipment each time upon their arrival at the site of an event that is often completely unfamiliar to them. Moreover, the operation using an OB Van usually involves direct videotaping (or live broadcast) that normally allows for no failure. Because it is the type of operation that demands sophisticated technical skills and long experience, the OB Van operating staff should consist of veteran engineers with high technical skills who are capable of coping effectively with any production field which is both of high level and wide-ranging.

On the other hand, as mentioned above, on-location broadcasting is not a daily task. Thus, the OB Van personnel must be capable of covering a wide range of work whenever there is no outside-broadcast scheduled. At such times, they can be relied upon as reserve staff to assist in the production of programs in the studio within the station or in the EFP operation as explained in the next section.

(f) Master Control Personnel

Following the Programming Plan Phase 1, the aforementioned 3-shift system will be established for the transmission of the programs which will be scheduled as follows:

- Four hours 20 minutes of morning school broadcasts from 07:00 to 11:20.
- Four hours 20 minutes of afternoon school broadcasts from 13:00 to 17:20.
- Four hours 5 minutes of night broadcasts from 18:40 to 22:45.

The Public Notice programs on the programming schedule will be produced and transmitted on-line, using the continuity room attached to the master control room and with an announcer appearing on the TV screen. This operation will be the work of the master control personnel.

To produce these Public Notice programs, two EFP crews will be mobilized each day. The materials gathered by the two crews will first be roughly edited in the VTR editing room and then will be inserted as material into the Notice Hours. These Notice programs will be produced and transmitted as the inserted materials and mixed with the pictures of on-screen announcer and opaque cards (TELOPs).

The overlapping personnel in the daytime will be assigned to such work as videotaping outside the station (including reception of foreign broadcasts by TVROs), TV system conversion and dubbing work.

The required minimum of five personnel for each shift will be as follows:

- One TD, the leader and person responsible for the entire transmission work.
- Three Program-transmission operation personnel, one each in charge of:

- Operation of transmitting VTR and transmitting console
  - Continuity room operation
  - Back-up of communications with regional stations
- One in charge of TV Transmitter operation

Once the broadcasting service is started, the number of shifts will have to be increased to three, so the required number of personnel per day will be 5 persons  $\times$  3 shifts = 15 persons. Holidays must also be taken into account. In other words, since the annual number of workdays is about 200 days, the need will arise to secure a total number of personnel corresponding to 1.8 times the number of personnel required in principle (that is, 365 days  $\div$  200 days = 1.8 times). This, in turn, means that, for the master control room, for example, the number of engineering personnel actually required will be 15 persons  $\times$  1.8 = 27 persons.

(g) Technical Management Personnel

For efficient operation of the projected educational broadcasting network system in Paraguay, it is considered advisable to adopt a centralized maintenance and management system headed by a responsible engineer who is well versed in the outgoing transmission system as a whole including the transmitters installed nationwide and the program transmission system to those transmitters.

The recent complete solid-state TV transmitters have a high stability and reliability and the frequency of failures in broadcasting equipment units is expected to be extremely low. Consequently, the number of personnel required for routine operation and monitoring at each of the regional transmitting stations (or relay stations) can be kept at a minimum. This is because that whenever the need occurs for the repairing of failures, such needs can be coped with effectively by such means as sending a centralized maintenance engineer from the headquarters carrying extra units for repairs or having the repairs made locally after technical communication by telephone.

Three engineering personnel belonging to the Technical Management Division will be necessary to take care of the maintenance of power sources, emergency generators, power distribution systems, building air-conditioning equipment, telephones, centralized clock system and interior coordination equipment.

(h) Effective Use of New Employees in Training

In order to train a newly recruited staff member into a full-fledged engineer capable of effectively carrying out the program production work in a broadcasting station, a training period of at least one year is normally required. Hence, it is considered advisable to provisionally employ a number of new recruits, give them responsibility for various kinds of work for certain periods, give them on-the-job training, discover their respective aptitudes and help them further develop such skills for various types of work.

The number of personnel described above is required in theory. In actual practice, there are many cases where the number of personnel must be supplemented by assistants, based on the continually changing requirements of the program production side and on the actual production conditions, especially in the case of outside broadcasts and video location work. Therefore, new employees will often be assigned to such assistance work every time the need arises in order to cover the manpower shortage and, at the same time, to give the employees valuable on-the-job training.

(i) Regional Relay-station Personnel

The Ciudad del Este station and the Encarnacion station will both produce local programs in the future (Phase 3) and will each need a production team consisting of three members, one producer and two assistants to run the program production. In addition to this production team, one technician will be necessary for each shift to attend to the operation and monitoring of transmitters. Since a 3-shift system must be adapted, each of the two stations will require 3-4 persons for the operation and monitoring of transmitter.

Each of the regional key relay stations (those with a transmitter having an output of 5kW or more) will require 3-4 such operator-monitor personnel. Since there are ten such key relay stations in Paraguay, a total of 35-40 engineering personnel will be necessary for all these regional transmitting stations.

The operation of the low-power relay stations, which re-transmit programs by means of on-air relays from the key relay stations, will be conducted automatically. The operation and management of these low-power relay stations will adopt a maintenance system in which the maintenance work will be monitored by specific organizations in the service area, such as primary schools and regional education centers, that will report any irregularity to the manned key relay station at the master station. In case of serious trouble such as radiowave stoppage, the engineering staff in charge of transmitters will go immediately from the manned key relay station to the relay station, check the condition of the trouble and, at the same time, report the results to the central maintenance center in Asuncion so that the necessary repair steps may be taken in cooperation with personnel from the maintenance center.

The number of regional relay station personnel increased in number in stages according to the expansion and maintenance plans for the broadcasting network as follows:

	<u>Phase 1</u>	<u>Phase 2</u>	<u>Phase 3</u>
Regional Key Relay Station Engineering Personnel	9 persons (3 stations)	40 persons (10 stations)	(10 stations)
Program-production Personnel at Ciudad del Este and Encarnacion Stations (3 persons x 2)	0	0	6

## **7.2 Maintenance Plan**

### **(1) Basic Policy for Maintenance Plan**

Although there are two commercial TV stations that have been operating in Paraguay, this national educational TV network will be the first operation run by a newly established broadcasting body which has no experience in systematic formal TV educational broadcasting.

Therefore, maintenance planning should take into consideration the following two items:

- (a) A maintenance system practical and possible in Paraguay.
- (b) A maintenance method that can be understood by even the newest operation staff of the ETV Center.

### **(2) Establishment of Centralized Maintenance System**

The reliability of recent broadcasting equipment has been significantly improved through the adoption of ICs, and the frequency of failures has decreased significantly. But when a failure does occur, the repair of the electric equipment requires very high-level knowledge, and specialized agents or equipment makers from outside of the country must be commissioned.

In order to manage the maintenance of the whole broadcasting equipment, centralized maintenance groups shall be organized which should conduct their maintenance work with the full support of the service centers.

### **(3) Procurement of Regular Maintenance Budget**

In the case of maintenance work, the commissioning of outside firms such as foreign manufacturers, the repair of failed equipment and the purchase of spare parts and other equipment units is very expensive. Therefore, approximately 3% of the costs of the equipment of the entire system must be secured in order to cover repair costs, especially payments in foreign currencies.

**(4) Periodic Maintenance System**

It is necessary to conduct periodic maintenance of the broadcasting facilities, such as repairing the studio floors, cleaning the studio lighting equipment, etc.

**(5) Careful maintenance of VTR head-tips abrasion and VTR tapes**

Since the VTR head-tips are the only items to be encounter abrasion while being used, one of the major causes of deterioration of broadcasting quality, it is very important to be well maintained.



## CHAPTER 8 ESTIMATES OF PROJECT COSTS

### 8.1 Construction Cost

The total cost for the construction of facilities envisaged in the Master Plan is estimated at 45.4 million dollars. Of the amount, 33.5 million dollars is to be provided in foreign currencies and 11.9 million dollars by the Paraguay currency.

The project consists of the following four construction works.

- Work 1 Construction of a television transmitting station in Asuncion, which covers 40% of Paraguayan population, and supplementation of existing studio facilities (US\$4.7 million)
- Work 2 Construction of the ETV Center in Asuncion and construction of stations in three major regional cities, which increases total population coverage to 62 % (US\$19.3 million)
- Work 3 Construction of remaining nine regional transmitting stations of 13 1st-plan station, which increases total population coverage to 84 % (US\$10.8 million)
- Work 4 Construction of ten 2nd-plan regional stations, which increases total population coverage to 94 %, and construction of studios in major regional stations (US\$10.6 million)

By utilizing ANTELCO's station facilities, nine stations out of 13 1st-Plan stations, and six stations out of 10 2nd-Plan stations, reductions of construction cost as well as operating staff number can be possible.

Table 8.1.1 shows the cost of each construction work.

Table 8.1.1 Cost of Construction Works

		Unit: US\$million		
		Foreign	Local	Total
a	Construction Work 1	4.0 (85%)	0.7 (15%)	4.7
b	Construction Work 2	12.4 (64%)	6.9 (36%)	19.3
c	Construction Work 3	8.8 (81%)	2.0 (19%)	10.8
d	Construction Work 4	8.3 (78%)	2.3 (27%)	10.6
<b>Total</b>		<b>33.5 (74%)</b>	<b>11.9 (26%)</b>	<b>45.4</b>

The breakdown of each construction work is shown in Table 8.1.2.

Table 8.1.2 Details of Construction Work

		Unit : M\$
a	Construction Works 1	<u>4.7</u>
	(1) Civil Work	0.7
	(2) Equip. Installation	3.8
	(3) Engineering Service	0.2
b	Construction Works 2	<u>19.3</u>
	(1) Civil Work	6.9
	(2) Equip. Installation	11.3
	(3) Engineering Service	1.1
c	Construction Works 3	<u>10.8</u>
	(1) Civil Work	2.0
	(2) Equip. Installation	8.2
	(3) Engineering Service	0.6
d	Construction Works 4	<u>10.6</u>
	(1) Civil Work	2.3
	(2) Equip. Installation	7.7
	(3) Engineering Service	0.6
e	Total	<u>45.4</u>
	(1) Civil Work	11.9
	(2) Equip. Installation	31.0
	(3) Engineering Service	2.5

## 8.2 Construction Schedule and Annual Investment Plan

The project shall be implemented stage-by-stage as shown in the construction schedule, Figure 8.2.1. The investment amounts include in-land transportation cost and 10% import tax of foreign portion.

Figure 8.2.1 Construction Schedule

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Development Phase	Pre-para-tory	Ex-peri-men-tal	Introduction			Full-scale 1		Full-scale 2		Integrated							
Construction Schedule	Construction Works 1		Construction Works 2			Construction Works 3		Construction Works 4									

The annual investment plan of the construction is shown in Table 8.2.1.

Table 8.2.1 Annual Investment Plan

Unit: US\$million

	Investment Budget			
	Foreign	Local	Total	
1994	0	0	0	
1995	4.0	0.7	4.7	(Work 1)
1996				
1997	0.4 ] 12.4	5.9 ] 6.9	6.3 ] 19.3	(Work 2)
1998	12.0 ]	1.0 ]	13.0 ]	
1999				
2000	0.1 ] 8.8	1.2 ] 2.0	1.3 ] 10.8	(Work 3)
2001	8.7 ]	0.8 ]	9.5 ]	
2002				
2003				
2004	8.3	2.3	10.6	(Work 4)
2005				
2006				
2007				
2008				
	33.5	11.9	45.4	

### 8.3 Annual Operating Cost

According to the Programing Plan (Chapter 3) and Operation and Maintenance Plan (Chapter 7), annual operating costs are calculated as the followings.

#### (1) Items of Operating Cost

Necessary items to be included to the operating cost are shown below.

- ① Personnel Expenses
- ② Program Production Cost
- ③ Maintenance Expenses
- ④ Supply of Raw Video Tapes
- ⑤ Electricity Charge
- ⑥ Tariffs for Microwave Networks
- ⑦ Administrative Management Expenses

(2) Calculation of Each Operating Cost

1) Personnel Expenses

Table 8.3.1 shows the personnel expenses for each developmental phase, calculated in consideration of the full-day working conditions of the educational television service and a reasonable salary level to attract expert manpower.

With regard to the staff in charge of program production and transmission, the numbers of producers, art designers and engineering/technical staff are estimated as shown in Table 8.3.1. As for administrative staff, since they are considered as a supporting group for the production and transmission staff, the personnel cost for the administrative staff is estimated as 15% of the above in an average.

Table 8.3.1 Personnel Expenses<sup>1</sup> for Each Developmental Year

Unit: \$

	No. of Staff	Ave. Salary / M		
<b>Preparatory Phase (1st year)</b>				
P. Producers (PDs)	8	700	5,600	} x 2
Assist. PDs	4	500	2,000	
Art Designers	3	600	1,800	
Engineers/Technical Staff	10	650	6,500	
Administ. Staff			Sub total x 15%	28,620
			Total	219,420
<b>Experimental Phase (2nd year)</b>				
P. Producers (PDs)	11	700	7,700	} x 12
Assist. PDs	6	500	3,000	
Art Designers	5	600	3,000	
Engineers/Technical Staff	22	650	14,300	
Administ. Staff			Sub total x 15%	50,400
			Total	386,400
<b>Introduction Phase (3rd year)</b>				
P. Producers (PDs)	15	700	10,500	} x 12
Assist. PDs	6	500	3,000	
Art Designers	7	600	4,200	
Engin./Tech. Staff	46	650	29,900	
New Eng./Tech. (OJT)	10	500	5,000	
Administ. Staff cost			Sub total x 15%	94,680
			Total	725,880
<b>Introduction Phase (4th year)</b>				
P. Producers (PDs)	26	700	18,200	} x 12
Assist. PDs	8	500	4,000	
Art Designers	9	600	5,400	
Engin./Tech. Staff	63	650	40,950	
New Eng./Tech. (OJT)	10	500	5,000	
Administ. Staff cost			Sub total x 15%	132,390
			Total	1,014,990
<b>Introduction Phase (5th year)</b>				
P. Producers (PDs)	32	700	22,400	} x 12
Assist. PDs	13	500	6,500	
Art Designers	11	600	6,600	
Engin./Tech. Staff	76	650	49,400	
New Eng./Tech. (OJT)	20	500	10,000	
Administ. Staff cost			Sub total x 15%	170,820
			Total	1,309,620
<b>Full Scale Phase I (6-8th year)</b>				
P. Producers (PDs)	50	750	37,500	} x 12
Assist. PDs		(5)* only for 8th year	500	
Art Designers	12	650	7,800	
Engin./Tech. Staff	93~106	700	69,650	
Administ. Staff cost			Sub total x 15%	206,910
			Total	1,586,310
<b>Full Scale Phase II (9-11th year)</b>				
P. Producers (PDs)	55	750	41,250	} x 12
Assist. PDs		(5)* only for 11th year	500	
Art Designers	12	650	7,800	
Engin./Tech. Staff	142	700	99,400	
Administ. Staff cost			Sub total x 15%	267,210
			Total	2,048,610
<b>Full Scale Phase III (12-14th year)</b>				
P. Producers (PDs)	60	750	45,000	} x 12
Assist. PDs	0	—		
Art Designers	12	650	7,800	
Engin./Tech. Staff	149	700	104,300	
Administ. Staff cost			Sub total x 15%	282,780
			Total	2,167,980

## 2) Program Production Cost

Generally, Program Production Costs vary according to each program contents depending on the performance fees, original royalty, scenario writer's fee and the studio sceneries' costs in addition to the producer's daily miscellaneous expenses' including transportations and other expenses directly related to program production. Program Production Cost can be defined as directly required expenses for the production of programs. Here, setting an average unit production cost for each categorized program, multiplying scheduled number of programs, year-wise production cost shall be calculated as showing below Table 8.3.2.

Table 8.3.2 Program Production Cost

Unit: thousand US\$

Developmental Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
	Experimental Phase		Intoroduction Phase			Full-Scale Phase I			Full-Scale Phase II			
Primary School Program etca = 400\$	20	64	192	256	240	160	160	160	120	120	120	120
Educ. Wide a = 1.000\$				156	365	365	365	365	365	365	365	365
Public Notes a = 400\$						292	292	292	292	292	292	292
General ProgramsOB VAN a = 3.000\$						150	150	150	150	150	150	150
on Sat. s&San.s Other a = 2.000\$						620	220	220	220	220	220	220
Music a = 800\$							64	64	80	80	80	80
Secondary School 1.2 a = 400\$							80	80	32	112	112	112
Drama a = 300,000/Y							300	300	300	300	300	300
Woman's Hour a = 600\$												150
Vacational a = 600\$												150
Total	20	64	192	412	605	1587	1631	1631	1559	1639	1639	1919

## 3) Maintenance Cost

Since there is no available basic data in Paraguay, the calculation is based normal base used in Japan that repair expenses are said to total 3.0% of the cost of the entire equipment cost. Hence the amounts of repair expenses that require to be budgeted are:

Construction Works I	$3.2M\$ \times 3\%$	=	96,000 \$/Year
Construction Works II	$96,000\$ + 9.5M\$ \times 3\%$	=	381,000 \$/Year

Construction Works III      381,000\$+6.0M\$×3% = 561,000 \$/Year  
 Construction Works IV      561,000\$+6.3M\$×3% = 96,000 \$/Year

4) Supply of Raw Video Tapes

Based on the programming plans for each developmental phase, the required supply and cost of raw video tapes is calculated as shown Table 8.3.3.

Table 8.3.3 Supply of Raw Video Tapes

Unit: thousand US\$

Developmental Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
	Experimental Phase		Intoroduction Phase			Full-Scale Phase I			Full-Scale Phase II			
Primary School Program etc	50	160	480	640	600	400	400	400	300	300	300	300
Ganral programs on Sat.s&San.s						360	160	160	160	160	160	160
Music							80	80	100	100	100	100
Secondary School 1.2							200	200	80	280	280	280
Woman's Hour												250
Vacational												250
												150
① Total	50	160	480	640	600	760	840	840	640	840	840	1,490
② ×2	100	320	960	1,280	1,200	1,520	1,680	1,680	1,280	1,680	1,680	2,980
③ ②×40\$ Unit: Thousand US\$	4.0	12.8	38.4	51.2	48.0	60.0	67.2	67.2	51.2	67.2	67.2	119.2

The durations of the programs to be produced range from 20 minutes to 120 minutes with an average of 40 minutes per program. In making the estimations, the calculations have been on the following assumptions:

- ※1 One roll of 40-minute raw tape costs about US\$40. For example, in Paraguay, the market price of one roll of 60-minute Betacam tape SBT-60ML is \$39.6 as of March 20, 1993.
- ※2 To produce one program, two rolls of tapes are usually required for such purposes as recording outside the broadcasting station and distribution.

## 5) Electricity Charge

The necessary final electricity power of total will be calculated as 3.2Mkwh per year for the ETV Center and for the regional transmitting stations. The current electricity charge for public usage such as this Project, the unit cost is 0.95\$ per 100kW. Therefore, the electrify charge at the final phase is calculated as 30,000\$ per year.

On the same calculation basis, the electricity charge for each year will be as shown below Table 8.3.4.

Table 8.3.4 Yearly Electricity Charge

For Introduction Phase	360,000kwh	$\times 0.95\$/100kW =$	3,500\$/Year
For Full-scale Phase I	1,010,000kwh	$\times 0.95\$/100kW =$	9,500\$/Year
For Full-scale Phase II	2,020,000kwh	$\times 0.95\$/100kW =$	19,200\$/Year
For Full-scale Phase III	3,200,000kwh	$\times 0.95\$/100kW =$	30,000\$/Year

## 6) Tariffs for Microwave Networks

According to tariffs of ANTELCO, at the condition of long-term leasing (minimum 1 month, more than 4 hours/day), for the first hour 29.55\$ per hour and after one hour one hour 22.13\$ per hour.

Table 8.3.5 Yearly Tariffs for Microwave Network

For Introduction Phase		
For Full-scale Phase I	15 hours/day 1 Route	=123,900\$/Year
For Full-scale Phase II	16 hours/day 4 Routes	=527,800\$/Year
For Integration Phase	17 hours/day 4 Routes	=560,000\$/Year



## 7) Administration/Management Expenses

Since there is no available data for this estimation in Paraguay, an example in Japan which is 10% of total of other running cost is assumed.

Summarizing the above, annual operating costs including the Administration/management expenses corresponding each stage are shown in the Table 8.3.6.

Table 8.3.6 Annual Operating Costs

Unit: US\$thousand

	Personnel Costs	Program Production Costs	VTR tapes	Microwave Networks	Electricity	Mainten ance	Administ ration	Total
1994	219	20	4	0	0	0	24	268
1995	386	64	13	0	0	0	89	552
1996	726	192	38	0	4	96	148	1,204
1997	1,015	412	51	0	4	96	222	1,801
1998	1,310	605	48	0	4	96	393	2,455
1999	1,586	1,587	60	124	10	381	562	4,309
2000	1,586	1,631	67	124	10	381	571	4,370
2001	1,586	1,631	67	124	10	381	655	4,453
2002	2,049	1,559	51	528	19	561	751	5,578
2003	2,049	1,639	67	528	19	561	761	5,624
2004	2,049	1,639	67	528	19	561	854	5,708
2005	2,168	1,919	119	560	30	750	914	6,460
2006	2,168	1,919	119	560	30	750	914	6,460
2007	2,168	1,919	119	560	30	750	914	6,460
2008	2,168	1,919	119	560	30	750	914	6,460
2009	2,168	1,919	119	560	30	750	914	6,460

#### 8.4 Annual Required Expenditure (Construction Costs + Annual Operating Costs)

Annual required expenditures (Construction Costs + Annual Operating Costs) for the Master Plan Project are shown in Table 8.4.1

Table 8.4.1 Annual Required Expenditure

Year	Construction Costs	Operating Costs	Unit: Million US\$
			Total
1994	0	0.3	0.3
1995	4.7	0.6	5.3
1996	0	1.2	1.2
1997	6.3	1.8	8.1
1998	13.0	2.5	15.5
1999	0	4.3	4.3
2000	1.3	4.4	5.7
2001	9.5	4.5	14.0
2002	0	5.5	5.5
2003	0	5.6	5.6
2004	10.6	5.7	16.3
2005	0	6.5	6.5
2006	0	6.5	6.5
2007	0	6.5	6.5
2008	0	6.5	6.5
2009	0	6.5	6.5

## CHAPTER 9 PROJECT EVALUATION

### 9.1 Basic Principles of Evaluation

The Master Plan has multiple objectives, i.e. (i) qualitative improvement of school education through school broadcasting, (ii) fulfillment of the basic learning requirements of children who do not or cannot attend school due to various reasons, young people and adults and of the requirements for specific knowledge and skills and (iii) diffusion of general education among the public.

#### (1) Socioeconomic Analysis

The objective of the analysis is to estimate the socioeconomic effects of the implementation of in the Master Plan and to assess the feasibility of the Master Plan from a socioeconomic standpoint.

As the Master Plan is formulated as part of a social development plan designed to meet the basic learning requirements of the public, it does not intend direct monetary benefits. Evaluation of the Project in the Master Plan was not, therefore, based on the scale of economic benefits resulting from the implementation of the Mater Plan but from the socioeconomic viewpoint in regard to the prospective contribution of the Project to the diffusion of basic education among the public. The following two types of effects were evaluated.

- Direct effects : direct effects on recipients of educational broadcasting
- Secondary effects : social effects caused by socioeconomic extension of direct effects

From the implementation of the Project in the Master Plan it can be ascertained that various effects will be brought upon the society and economy of Paraguay. However, because the economic benefits of the implementation cannot be assessed in monetary terms, the socioeconomic benefits of implementing the Project will be assessed in qualitative terms.

## **(2) Financial Analysis**

The financial cost for the investment, the operation and maintenance for the Project are subject to the financial analysis. As the anticipated sources of income for the educational broadcasting body are limited to those from advertisement broadcasting to be inserted among educational and cultural programs for general public, the likely cash flow of the organization responsible for the educational broadcasting and the required scale of government subsidy are estimated. The suitability of providing such a government subsidy is also examined in relation to the trends of government finance.

## **9.2 Socioeconomic Effects of Educational Television Broadcasting**

### **9.2.1 Preconditions of Evaluation**

The effects of educational television broadcasting are not uniform and depend on the program contents and the method of its use. The types of programs use methods and recipients environment, which are the preconditions of evaluation, are shown in Table 9.2.1.1.

Table 9.2.1.1 Program Contents, Use Method and Recipients Environment of Educational Television Broadcasting by Type of Education

Type of Education	Main Programmes			Use Method (Basic Unit)	Recipient Environment
	Short-Term Targets	Medium-Term Targets	Long-Term Targets		
1. School Education					
1-1 School Broadcasting					
1-1-1 Primary Education	Spanish; arithmetic; science; health and hygiene	as left	as left	school	teacher shortage, gap between educational environment of urban and rural areas
1-1-2 Secondary Education	instruction method for each subject; method to efficiently use broadcasting	basic courses (natural science; hygiene; art; social studies; labour)	addition of specialised subjects to basic courses	school	2-shift system; shortage of teachers and teaching materials
1-1-3 Teacher Training	instruction method for each subject; method to efficiently use broadcasting	instruction method for each subject	as left	school	shortage of research and/or private learning time due to 2-shift system; high education cost
1-2 Correspondence Broadcasting					
1-2-1 Secondary Education			Spanish; mathematics; natural science	individual	disadvantageous element due to inadequate school facilities, need to work for the family and poor transport
1-2-2 Teacher Training	instruction method for each subject; method to efficiently use broadcasting	as left	as left	individual	as above
2. Social Education					
2-1 Specialised Broadcasting					
2-1-1 Socially Weak	anti-illiteracy education	addition of basic knowledge required for social and family life	addition of information on social activities and social issues	group/individual	not wealthy (non-possession of TV set)
2-1-2 Specific Recipients	women; culture; environment; public hygiene; civil life; others	as left	technical and other courses to meet specific demands	individual	insufficient opportunity for education, including a shortage of facilities
2-2 General Education				individual/family	

## 9.2.2 Direct Effect of Educational Television Broadcasting

### (1) School Education Broadcasting

#### 1) The Primary and Secondary Level Education

By introducing educational television broadcasting into education, it is estimated that the expansiveness, synchronism and massive volumes of information provided by television broadcasting have produced the following effects.

a. Standardization by dissemination of appropriately produced programs

b. Provision of new educational materials

##### 1) Standardization of School Education

Implementation of the Project has made it possible to use television broadcasts consistently in schools, where is insufficiency of good-quality teachers, and in regions where there are shortages of educational materials and equipment and of facilities for educational purposes, broadcasting of television programs to serve as audio-visual aides for digesting prescribed curriculums is expected to have a major impact on the augmentation and standardization of the primary and secondary level education.

Moreover, by teaching through television broadcasts, teachers themselves can get a better understanding of the significance and requirements of the curriculum. At the same time they can master the most appropriate methods of instruction. In these respects, educational television is expected to make a large contribution.

Because the programs are self-sufficiency-oriented, the amount of work required of the teacher for lesson preparation can be reduced, and more time can be spent at independent study, etc.

Educational television is no substitute for the distribution of textbooks. Nevertheless, under present conditions in which textbooks

are not adequately distributed, television broadcasts can be expected to bolster understanding of course contents by students who do not have textbooks. And television programs designed to complement teaching guidance made it possible for students to progress with little variation and thus contribute to the achievement of uniformity in the level of education.

#### ii) Provision of New Educational Materials

Given the huge volume of information transmitted by television, it is in this field of education that the unique advantages of television can be most widely used. Educational television can be a powerful tool of education, presenting the most highly developed visual information in terms of the five senses. Great improvements in the quality of learning can be expected from using this tool continuously.

The outstanding feature of television is that it can present information on a particular theme from diverse perspectives in a comprehensive and progressive manner. It can be especially effective in helping children or students to understand the subject matter when there are shortages of teaching materials and equipment. At schools with inadequate laboratory facilities or specimens, television broadcasts of trial experiments or simulations can bolster student comprehension. Television broadcasting cannot directly convey tactile, olfactory or gustatory information, but these deficiencies can be compensated for by oral explanations and other means. And in the case of teachers who do not have adequate experience to serve as specialists, television broadcasts can be just as effective as the actual conduct of experiments, etc.

The provision of supplementary teaching materials and equipment, of libraries and laboratories, on a nationwide scale would incur tremendous costs. In rural areas in particular, where the numbers of students per school and per classroom are so small, the unit costs would be extremely high. The fact that roughly the same results can be obtained with educational television suggests that it will bring a substantial improvement in the level of education nationwide.

In school education at present, with the shortage of teaching materials and equipment, teachers themselves cannot always understand the general and essential meaning of the curriculum, but no significant effort is made to encourage students to raise questions themselves and conduct research and study on their own in order to advance their education.

Educational television is appropriate for identifying problematic points regarding a theme and presenting the various aspects of the theme in a comprehensive, progressive manner. By introducing this mode of learning into school education, children will acquire the ability to educate themselves, will improve their abilities to solve problems, and will increase their abilities to use the aggregate of their knowledge, skills and techniques in the future.

Moreover, with implementation of a system of serial broadcasting, when time in the classroom has been insufficient, students can study at home by watching second broadcasts (on Saturdays or Sundays, or at other shift times), thus gaining a supplementary benefit from educational television.

## 2) Teacher Training

Introduction of educational television broadcasting in this field also has similar two types of direct effects to school broadcasting because of the characteristics of television broadcasting.

- a. Provision of same level of learning materials throughout the country
- b. Provision of various types of specialized programs and new teaching method
  - i) Provision of Same Level of Education Throughout the Country

It has become evident that for the schools in rural areas, where there are fewer students, huge investments of time and money are required to assign an adequate number of teachers for each course. Television programs prepared by specialists in each subject and



television education based on manuals written on the assumption that the classroom teacher is not fully competent will surely prove to be an effective and efficient means of making up for the present scarcity of specialist teachers.

What is more, educational television has made it possible in rural areas to study detailed instruction methods and teaching skills under appropriate supervision in a form closely resembling actual teaching experience. It thus contributes to greater effectiveness and efficiency in the development of teacher training.

Furthermore, with the dissemination of programs created by top-level specialists, beginning with ISE professors and lecturers, it will be possible to master a high level of scholastic knowledge in rural areas, and thus television can be expected to greatly reduce the disparities currently found in the quality of teacher education and training.

For secondary level education, a system of instruction by subject is adopted. This means that magnification of constituent courses involves the establishment of many specialist courses. Consequently, steps must be taken to rectify the shortage of specialist teachers at teacher training facilities. In this respect as well, educational television can be expected to prove more and more beneficial in the future.

#### ii) Provision of Various Types of Specialized Programs and New Teaching Method

At teacher training schools throughout the nation, VCR facilities have already been installed. Various programs can be presented on tapes. These tapes can be played when other broadcasts are absent, and broadcasts can be recorded on these tapes and used. This in turn helps to make up for deficiencies in teaching materials and equipment, as well as course teachers, in regional teacher training schools, and to enhance teacher teaching capabilities.

Numerous curriculums are included in the training of teachers. In advancing these curriculums, a broad spectrum of specialist teachers, all types of facilities, and various materials and equipment are required. And the installation and maintenance of these items incur excessive time and costs.

Under present conditions as described above, educational television based on programs produced by specialists in each subject or based on manuals written for teachers who may not have adequate teaching competence or specialized knowledge, can make up for the scarcity of specialist teachers in the education and training of teachers and will thus prove to be a valuable tool for preparing teachers effectively and efficiently.

Moreover, it will be possible to conduct classroom learning more effectively by providing more detailed teaching materials together with audio-visual information.

## (2) Correspondence Broadcasting

### 1) The Secondary Level Education

Correspondence broadcasting will make it possible for those young people and adults with no special means of learning other than school education to acquire the basics of secondary level mathematics and natural science, etc., without disrupting their vocational careers with a view to utilizing the new knowledge in their daily lives.

The wider availability of secondary education will rectify the gap between urban and rural areas in terms of educational opportunities which is observed in many places throughout the country.

The use of this type of educational broadcasting by school students will stimulate their self-motivation to study harder and will improve the effects of school education.

## 2) Teacher Training

The launching of correspondence broadcasting for teacher training will improve the MEC's programs to re-educate incumbent teachers and to qualify the unqualified. It will become possible for students to learn concrete teaching methods at home instead of the conventional method of learning them at school.

Immediate positive impact can be expected in regard to the problem of unqualified teachers, the most serious problem today.

In addition, by introducing television education for the programs for re-education and qualification of currently employed teachers, as now conducted by the MEC, schooling times can be shortened and the overall classroom time can be reduced. This lightens the burden on students and on the MEC and makes it easier for a greater number of unqualified teachers to participate in the programs. The number of days of school attendance for schooling can also be reduced, and this reduces the burden especially for those participants in rural areas where transportation facilities are poor.

By introducing educational television to programs for re-education and qualification of active teachers will make it possible to receive education in rural areas at or near the same level as in Asuncion.

Another conceivable effect of educational television is that teachers currently employed will be able to elevate their professional competence through self study by watching broadcasts of programs for teachers prepared immediately after classroom hours.

### (3) Social Education Broadcasting

#### 1) Specialized Broadcasting for Socially Weak

##### i) Living Condition of Socially Weak in Rural Areas

Since medical facilities are inadequate in rural areas, there are few households living near health centers or clinical facilities. With the large number of people suffering from parasites, for example, in these communities, the dissemination of basic medical knowledge such as routine treatment and emergency measures has become paramount. Almost all households use wells because water supply facilities are still not adequate, and many of the wells do not have lids. Water for washing is very scarce in toilets, and in many cases toilets have no lids and no roofs. In order to improve their lives, many people want more knowledge and skills pertaining to home gardening, cooking, food processing, and nutrition. More than 30% of the females give birth to 5 or more children (about 6 children on average), and there is a great need for guidance in family planning. (Source: Survey of living conditions in rural areas by Mayumi Oonishi, Japan Overseas Cooperation Volunteers)

##### ii) Direct Effect of Social Education Broadcasting for Socially Weak

By using programs designed for literacy/adult or special education, it has become possible to make up for the deficiencies in teachers specializing in these branches of education, in teaching materials and in equipment and to promote these types of education programs effectively and efficiently.

With the introduction of educational television, it has become possible for teachers without specialized knowledge or skills in literacy or special education to provide such education. At present, teachers and volunteers are concentrated in urban areas, but with the introduction of educational television incorporated into regional activities, these human resources can be expected to be used more widely in rural areas.

The largest constraint on educational broadcasting for the socially weak is the low TV set diffusion level. While almost all households in urban areas and 85% in rural areas are expected to own a TV set by 2010, it is highly likely that those lacking a TV set will belong to the group of socially weak. The positive effects of social education broadcasting, therefore, presuppose an appropriate level of TV installation among the socially weak for group, if not individual, viewing.

Under these conditions, it can be assumed that progress in the movement to use broadcasting in group at the regional level as planned will greatly help to encourage illiterates to undertake literacy education. And by encouraging illiterates and other socially weak to obtain social education, they will participate more in social and regional activities, and this will stimulate the vitalization of regional society.

Basic job training accounts for 37% of the total participants in literacy and adult education. Most of this education involves practical training, but it can still be augmented by television because of the shortages of materials, equipment and facilities.

In the environment described above, it can be expected that the spread of television will contribute to improvement of the quality of life in rural areas through broadcasting of basic medical knowledge, knowledge on health and sanitation, and knowledge and skills pertaining to cooking and nutrition.

Moreover, by broadcasting and utilizing programs on various subjects via television, it will be possible to meet the needs of all types of socially disadvantaged including infants, minorities and women.

## 2) Specialized Broadcasting for Specific Users

The latest information provided by television broadcasting will improve the effects of training and will also be useful for instructors. The learning of key technical points through the planned broadcasting of technical programs will assist the learning efficiency of practical training.

The efficiency of vocational training in diversified courses will be much improved and response to changing skill requirements will be quick and effective.

## 3) Social Education Broadcasting for General Public

### 1) Direct Effect of Educational Broadcasting for General Public

The planed network will cover 94% of population including major part of rural areas. Although radio has spread throughout the nation, the volume of information it can convey in comparison to television is slight. It can be expected that the spread of television broadcasting will play a dominant role in reducing regional differences in quantities of available information.

In contract to the private broadcasting stations, the education and culture broadcasts for the masses promoted under this project provide information to each household which will help improve living conditions for the people; public education essential for social activities; or information on socially important issues. By fortifying home education in this manner, broadcasts for the masses contribute to improved living standards and public welfare.

And by providing viewers with a range of selections different from those by the private stations, these broadcasts can be expected to instill more selective viewing habits in the people.

Furthermore, government information service will be made more effective by providing information through televised education, and this will contribute to the formation of better social standards.

ii) Effect of Using PR and Advertising Revenues for Education

Another feature of this project is the possibility that public relations activities of government agencies, and public corporation etc., and private commercials which do not conflict with the objectives of this project are planned; and the income from these activities greatly reduce the costs born by the Government.

iii) Forecast of TV Dissemination and Feasibility of Broadcast Network Plan

Educational and cultural broadcasts by television for the masses are observed mainly by household units. Consequently, the question of whether or not one benefits from these broadcasts is determined by whether or not one owns a television receiver (In general the answer varies with income and with regional differences in the capacity to receive television broadcasts). It must be remembered, therefore, that educational and cultural television broadcasts for the masses will magnify the disparities in access to information because of the aforesaid differences in income and in regional characteristics.

Nevertheless, as noted in the forecast of demand for television (refer to supporting report), in the correlation between rate of television dissemination and per capita GDP, the linear trend in the case of a primary regression as a time series becomes reduced (It is suspected that a relative drop in the price of TV receivers is the cause). It is forecasted that TV receivers will spread rapidly also to rural areas and lower income strata.

### 9.2.3 Secondary Effect of Educational Television Broadcasting

Secondary Effects can be evaluated on i) school broadcasting for the primary level education, ii) school and correspondence broadcasting for the secondary level education and social education broadcasting for specific recipients, iii) school and correspondence broadcasting for teacher training, iv) social education broadcasting for socially weak and v) social education for general public.

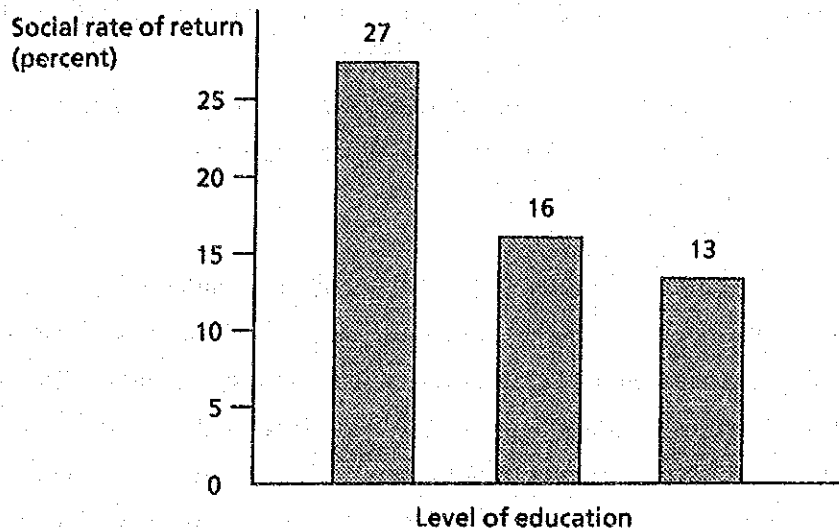
#### (1) School Broadcasting for the Primary Level Education

The primary level education is essential for a normal life, for developing one's capabilities, for improving the quality of life and work, and for adapting to social or cultural change.

In general, the economic benefits of an the primary level education are quite high, as shown in Figure 9.2.3.1. It also has a conspicuous effect on agricultural productivity (Figure 9.2.3.2).



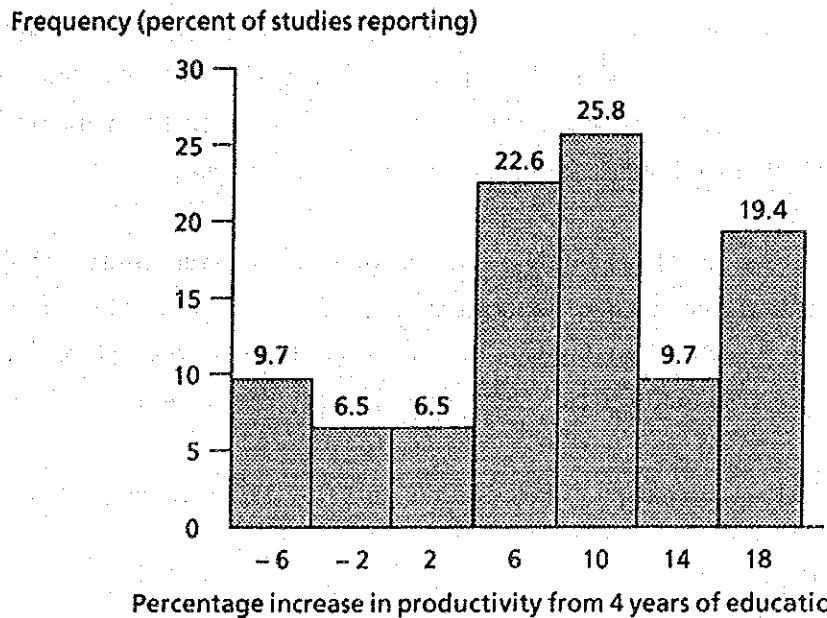
**Figure 9.2.3.1 Social Rate of Return on Investment in Education in Developing Countries (by level of education)**



Note : "Developing countries" refers to twenty-two African, Asian, and Latin American countries.

Source : Psacharopoulos (1981), P. 333.

**Figure 9.2.3.2 Relation between Agricultural Productivity and Four years of Education (survey data on 31 countries)**



Note : Mean, 8.7 percent; standard deviation, 9.0 percent.

Source : Jamison and Lau (1982), P. 9.

Promoting the dissemination of the primary level education has brought a remarkable improvement in social efficiency; for example, in the turnout for voting at elections, in requests for government service, and in public relations activities; and it has greatly impacted on the efficiency of government services.

The contribution made by educational television to the enhancement of the primary level education has had an exceptionally large impact on the society and the economy of Paraguay.

At the same time, the primary level education provides one with the ability to read and write, to make arithmetic calculations, and to solve problems, that is, abilities which are assumed for making judgments based on knowledge, for continuing with studies, for participating in social developments and for instigating social and cultural changes. It also provides the knowledge, skills, attitudes and values which serve as the foundation of learning and of skills development over a lifetime.

In looking at education as a whole, the enhancement and full implementation of the primary level education are found to form the foundation of a wholesome basic education. Thereafter, middle and high school education can be promoted and fortified, resulting in the establishment of human resources as required by industry and the labor market, in the cultivation of managers and leaders, and in the possibility of contribution to national development with one's own resources. The promotion of middle and high school education which is not based on a well-rounded program of the primary level education must be looked upon as a weak and distorted approach.

As noted in sections (1) and (5) of this paper, the augmentation of the primary level education through implementation of Master Plan has resulted in the fortification of the foundations of the educational pyramid and it has enabled wholesome development of the entire educational system.

(2) Educational Broadcasting for the Secondary Level Education and Specific Recipients

With the commissioning of the MERCOSUR (Mercado Comun del Sur; Southern America Common Market) as a turning point, Paraguay sets its development objectives to maintain firmly a growth of the primary industry

which is regarded as the priority area necessary for the national development, to promote diversification of industrial structure attaching importance on agriculture related industries so as to establish the rigid industrial system having a competitive performance in a regional and in international markets.

The most important issue among other things necessary for the future development of Paraguay is the investment to the human resources in Paraguay of which natural resources are scarce. From this point of view, the most important key issue in the education sector in general is an improvement of basic education as a common knowledge and value at every social stratum throughout the country, and securing an output of competent personnel having vocational, technological and managerial abilities which are required by the society in the future.

The provision of recent information on scientific, vocational and technological knowledge through educational broadcasting will modernize the secondary level education and vocational training in social education.

With the enhancement of these field of education, the supply of capable manpower demanded by industries (labor market) will be ensured.

### (3) School and Correspondence Broadcasting for Teacher Training

Educational television has had diverse effects on the education and training of teachers, and it has contributed extensively to the fortification of the same. In view of the bottleneck to education in Paraguay posed by the insufficient quality of teaching, educational television can be expected to contribute markedly toward elevation of the level of education as a whole.

Furthermore, broadcasts of programs concentrating on the problems in education can be expected to stimulate interest in and understanding of education in Paraguay can be expected to stimulate interest in and understanding of education among the people and to elevate awareness among them of the importance of education and of teacher.

Regional decentralization of education, centering on CREs, is currently being promoted in Paraguay. The cultivation of teachers also includes the cultivation of specialists in educational evaluation, educational planning and

educational management, but the only institution which can train such specialists at present is the ISE. In order to achieve decentralization and assign specialists to regional posts in the future, institutions for training specialists will have to be operated at regional locations even though exchange of personnel between central and regional points will still be mandatory.

In establishing such a course, ISE teachers will serve initially at the core, but the role of television broadcasts is also expected to be large.

The use of educational television at teacher training facilities as discussed above is expected to contribute to the advancement of regional decentralization of education and to the promotion of education in consideration of the level of educational resources and in conformity with the special characteristics of regional society and with social customs.

The social position of teachers in Paraguay is quite low. Consider, for example, wage levels. In 1992 the minimum monthly wage is 300,000 Guarani and the salary per single shift for an primary school teacher (qualified teacher) is 318,000 Guarani. This wage is very low for someone who has completed a high level of education. It accounts for the shortage of teachers and for the substantial increase in the number of unqualified teachers, those who have not received formal education for becoming teachers.

Furthermore, broadcasts of programs concerning on the problems in education in Paraguay can be expected to stimulate interest in and understanding of education among the people and to elevate awareness among them of the importance of education and teachers.

#### (4) Social Education Broadcasting for Socially Weak

Like the primary level education, education for the socially weak is an indispensable field for meeting the basic educational needs of the people, and it is one of the vital missions of the state.

The introduction of educational television has made it possible to promote formal or informal education to many of the socially disadvantaged at relatively low cost. This in turn enables the Government to expand its social welfare activities, and thus improvements in social welfare can be expected.

Social education promoted by regional community with group viewing educational broadcasting assist the participation of socially weak to the regional community and social life.

#### (5) Educational Broadcasting for General Public

Education takes place within the cultural, linguistic and spiritual climate of the society, and one of its aims is the dissemination and fortification of cultural and moral values. The individual and the society can discover its own subjectivity and value scale from among the values presented by education. At the same time, they can learn to be tolerant of different societies, governments and religions and can work for international peace and solidarity in a world of mutual dependence.

Nonetheless, in Paraguay, there are many people near the national border who receive broadcasts from foreign stations, and many of the programs broadcasted on private stations or cable TV were produced in foreign countries. Consequently, foreign programs account for much part of total TV viewing time.

The reasons for this trend are estimated as follows. The technologies for creating television programs in the neighboring countries are advances; much money is spent on making these programs so they will easily attract viewers; and broadcasts of many of them reach inside Paraguay. Another factor is the policy of private stations and cable TV stations to broadcast programs which do not incur heavy production costs or production facilities costs including studios; this is achieved by broadcasting movies and other foreign programs.

In contrast, educational television puts emphasis on broadcasts beneficial for improving daily life and on the provision of information essential for a wholesome life in society. It thus serves as a means of providing information closely related to the climate and social customs of Paraguay.

Programs for promoting the formation of a national consciousness and for cultivating a national identity are being scheduled as priority undertakings. In the MEC, which also supervises the promotion of culture, much concern is being voiced about the "cultural invasion" of foreign programs. Traditional culture is being introduced and spread through educational television and social education

is being designed so as to harmonize social developments with the traditional customs of Paraguay.

In consideration of the aforementioned, it is believed that the Project will contribute to the preservation of the social and cultural identity of Paraguay.

In addition, construction of local ETV center in Ciudad del Este and Encarnacion will foster regional and traditional culture and assist cultural exchange among regions.

Secondary effects of broadcasting for general public will vary depending upon the contents of programs. The positive effects might be as follows:

- Diffusion of the appropriate discipline and morales required for social life
- Improved public awareness of the living standard and quality of life.
- Promotion of democracy
- Revitalization of communal activities
- Improved living and welfare standards
- Prevention of cultural degeneration
- Promotion of international exchanges
- Industrial development and improved productivity
- Promotion of new family education through television
- Positive use of leisure time
- More efficient administrative services through government commercials
- Increased social importance of television broadcasting
- Higher TV installation rate and increased total consumption of information
- Restoration of public trust in public broadcasting
- Growth of broadcasting and information industries
- Fostering of broadcasting engineers

The result of the socioeconomic analysis can be summarized as Figure 9.2.3.3.

As show in the figure, the projects is evaluated to give many direct effects in each field and level of education and to produce effects of essential importance on the society and economy of Paraguay.

Figure 9.2.3.3 Socioeconomic Effects of Educational Television Broadcasting

(Current Condition) [ Direct Effect ]	Type of Programs of Educational Television Broadcasting						Secondary Effects
	School Broadcasting		Correspondence Broadcasting		Social Education Broadcasting		
	Primary Level	Secondary Level	Teacher Training	Secondary Level	Teacher Training	Specialized Weak Socially Weak	
Provision of Equal Information Throughout the country	(Regional disparities in enrollment, drop-outs and repeaters) (Variation in status of facilities, teaching materials and equipment) [ Progress in completion of prescribed curriculum ]	(Shortage of institutions, facilities, teaching materials and specialized professors) [ Progress in completion of prescribed curriculum ]	(Shortage of qualified teachers, variation of qualified teachers) [ Progress in completion of prescribed curriculum ] [ Reduced burden of participants ]	(Regional disparities in accessibility to educational opportunities) (Rapid growth in demand in rural areas and insufficient finance) [ Expansion in educational services ]	(Shortage of latest information) [ Prevention from outdated vocational training ]	(Regional difference in mass media) [ Provision of large amount of information throughout the country ]	<ul style="list-style-type: none"> <li>• Correction of regional disparities.</li> <li>• Improvement of level of education and culture.</li> </ul>
	Characteristics of Educational Television Broadcasting	(Shortage of qualified teachers, teaching materials and equipment) [ Improvement of children's capacity for self study and for independent inquiry ]	(Shortage of facilities, teaching materials and specialized professors) [ Effectiveness, diversity and efficiency of teacher training ]	[ Effectiveness of the MEC's program for teacher qualification ] [ Diversity in curriculum ]	(Mentality of illiterates) [ Promotion of participation in literacy and adult education ] [ Provision of essential information required in daily life ]	(Cultural crisis due to widespread viewing of foreign programs) (Contents of private broadcasts conforming to principles of commerce) [ Promotion of home education ] [ Cultivated of selective television viewing habits among people ]	
Provision of New Educational Materials, Equipment and Teaching Methods	(Shortage of qualified teachers, teaching materials and equipment) [ Improvement of children's capacity for self study and for independent inquiry ]	(Shortage of facilities, teaching materials and specialized professors) [ Effectiveness, diversity and efficiency of teacher training ]	[ Effectiveness of the MEC's program for teacher qualification ] [ Diversity in curriculum ]	[ Effectiveness of Correspondence program ]	(Shortage of latest information) [ Prevention from outdated vocational training ]	(Regional difference in mass media) [ Provision of large amount of information throughout the country ]	<ul style="list-style-type: none"> <li>• Fortification of educational pyramid.</li> <li>• Large socioeconomic impact.</li> <li>• Promotion of equal opportunity for basic education.</li> <li>• Better efficiency in government services</li> <li>• Supply of capable manpower to meet the demand of industries.</li> <li>• Adapted to competitive market of MERCOSUR.</li> <li>• Improvement of achievement in school education.</li> <li>• Promotion of decentralization of education.</li> <li>• Betterment of social welfare.</li> <li>• Encouragement of participation in social life and regional community.</li> <li>• Better living standard.</li> <li>• Preservation of social and cultural identity.</li> <li>• Utilization of Ad income for education.</li> <li>• Better awareness of importance of education and teachers</li> </ul>

### **9.3 Financial Analysis**

#### **9.3.1 Appraisal Method**

In this financial analysis, scope of the Project is defined as broadcasting of educational programs for the objective areas by the broadcasting entity as planned in each component of the Master Plan.

The cost for the Project consists of construction cost for establishment of the educational broadcasting network and operation cost of the broadcasting body. Financing cost will also analyzed in case where loans are necessary. The costs for reception or utilization of the program provided by the project, such as television installation or textbook preparation, are not included in this financial analysis.

The educational broadcasting is placed as part of the nation's social policy, the major part of financial source of the broadcasting entity should be funded by the National Treasury.

In this analysis the scale and the period of the subsidy from the National Treasury is clarified taking account of all necessary cost such as construction cost, operation cost and finance cost.

The other financial source for the broadcasting body -- in addition to the National Treasury -- is an advertisement income. Advertisement income is estimated putting in order what advertising income ought to be within the limit set corresponding to the public nature of the Project.

Even for the Project with strong public nature, reduction of the burden on the National Treasury should be considered under the budgetary constraints to secure smooth operation of the Project.

#### **9.3.2 Estimate of Subsidy from the National Treasury**

First, cashflows of a broadcasting is estimated based on the estimated cost of this project without taking into account any advertising income, and then estimated the required amount of subsidies from the National Treasury (Table 9.3.2.1 and Table 9.3.2.2).



In this estimation invariable prices, disregarding any inflation factors are applied. Also, the conditions of foreign loans only for foreign currency portion of initial capital investment are assumed as 25 years' repayment, including 5-year grace-period, and two cases -- 5% (case-1) and 10% (case-2) -- for interest, referring to the case where international agencies, such as the Inter-American Development Bank, financed a public agency in Paraguay.

As shown on Figures 9.3.2.1 and 9.3.2.2, in the two cases, the amount of subsidies from the National Treasury will be the largest in 2008, which corresponds to the replacement of production equipment of ETV Center in Asuncion: \$20 million in the case of 5% interest (case-1) and \$22 million in 10% interest case (case-2). Over the period up to 2010, subsidies from the National Treasury will amount to \$129 million in the case of 5% interest and \$146 million in 10% interest case.

Figure 9.3.2.1 Change in Subsidy from the National Treasury for the Project (Advertisement disregarded)

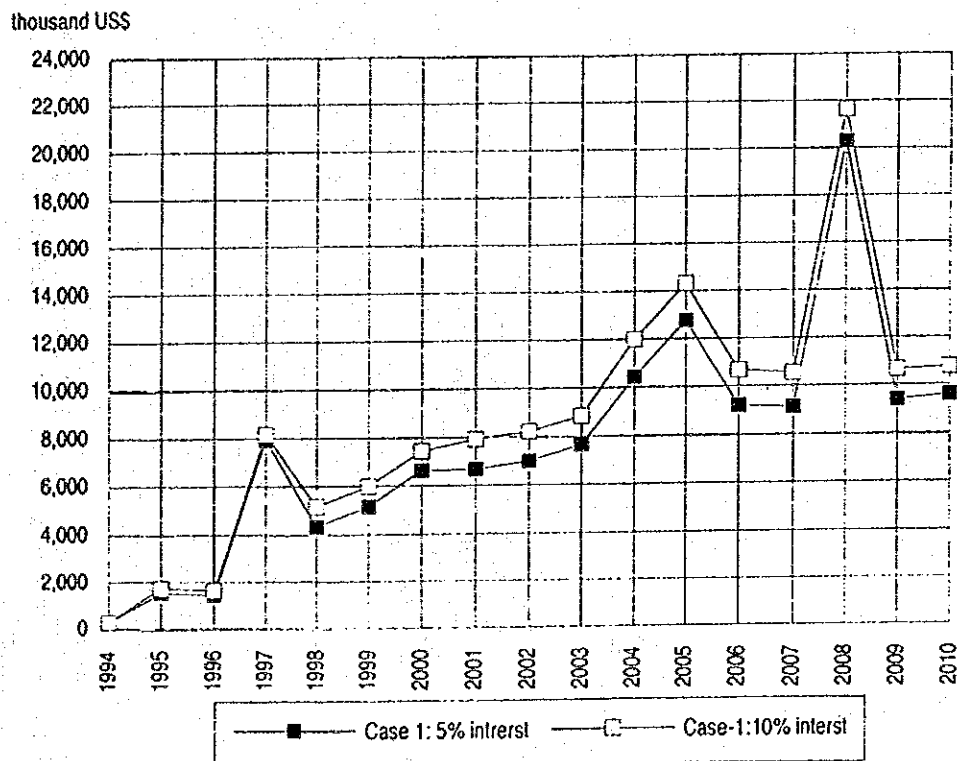


Table 9.3.2.1 Cash Flow of the Broadcasting Entity (Case 1) (in thousand US\$)

	Prep.		Experi.		Introduction Phase		Full-Scale Phase I		Full-Scale Phase II		Integrated Phase									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Accum. Ave.		
CASH BALANCE, BEGINNING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
CASH INFLOW																				
- Foreign Loan		4,025		421	11,950		89	8,753		8,347								33,586	2,099	
- Subsidy	268	1,492	1,405	7,926	4,304	5,129	6,614	6,649	6,971	7,633	10,407	12,778	9,184	9,121	20,292	9,391	9,585	129,150	8,072	
Total Cash Inflow	268	5,517	1,405	8,347	16,254	5,129	6,703	15,402	6,971	7,633	18,753	12,778	9,184	9,121	20,292	9,391	9,585	162,735	10,171	
CASH OUTFLOW																				
- Construction Expenditure		4,025		421	11,950		89	8,753		8,347		3,654			10,343			97	47,680	2,960
- Foreign		738		5,903	1,029		1,228	753		2,313		315			892			8	13,179	824
- Local		552	1,204	1,801	2,455	4,309	4,370	4,453	5,518	5,624	5,708	6,460	6,460	5,460	6,460	6,460	6,460	6,460	75,023	4,689
- Operating Expense		201	201	222	820	820	201	201	222	820	820	824	1,262	1,262	1,262	1,679	1,862	10,416	651	
- Amortization of Loans																				
- Principal																				
- Interest																				
Total Cash Outflow	268	5,517	1,405	8,347	16,254	5,129	6,703	15,402	6,971	7,633	18,753	12,778	9,184	9,121	20,292	9,391	9,585	162,735	10,171	
NET CASH INFLOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CASH BALANCE END	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACCUMULATED SURPLUS/(DEFICIT)		-4,025	-4,025	-4,446	-16,396	-16,396	-16,284	-24,836	-24,614	-23,794	-31,321	-30,497	-29,235	-27,973	-26,711	-25,032	-23,170			

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

Interest Rate 5%

Table 9.3.2.2 Cash Flow of the Broadcasting Entity (Case 2) (in thousand US\$)

	Prep. Experi.		Introduction Phase				Full-Scale Phase I				Full-Scale Phase II				Integrated Phase				2010 Accum. Ave.	
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			
CASH BALANCE, BEGINNING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
CASH INFLOW																				
• Foreign Loan		4,025		421	11,950		89	8,753			8,347							33,586	2,099	
• Subsidy	268	1,693	1,607	8,149	5,124	5,949	7,428	7,891	8,202	8,823	11,973	14,303	10,645	10,519	21,628	10,642	10,744	145,587	9,099	
Total Cash Inflow	268	5,718	1,607	8,570	17,074	5,949	7,517	16,644	8,202	8,823	20,319	14,303	10,645	10,519	21,628	10,642	10,744	179,173	11,198	
CASH OUTFLOW																				
• Construction Expenditure																				
- Foreign		4,025		421	11,950		89	8,753			8,347	3,654			10,343			97	47,680	2,980
- Local		738		5,903	1,029		1,228	753			2,313	315			892			8	13,179	824
• Operating Expense	268	552	1,204	1,801	2,455	4,309	4,370	4,453	5,518	5,824	5,708	6,460	6,460	6,460	6,460	6,460	6,460	6,460	75,023	4,689
• Amortization of Loans																				
- Principal							201	201	222	820	820	824	1,262	1,262	1,262	1,679	1,862	10,416	651	
- Interest		403	403	445	1,640	1,640	1,628	2,484	2,461	2,379	3,132	3,050	2,923	2,797	2,671	2,503	2,317	32,876	2,055	
Total Cash Outflow	268	5,718	1,607	8,570	17,074	5,949	7,517	16,644	8,202	8,823	20,319	14,303	10,645	10,519	21,628	10,642	10,744	179,173	11,198	
NET CASH INFLOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CASH BALANCE END	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
ACCUMULATED SURPLUS/DEFICIT		-4,025	-4,025	-4,446	-16,396	-16,396	-16,284	-24,836	-24,614	-23,794	-31,321	-30,497	-29,235	-27,973	-26,711	-25,032	-23,170			
Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)																				
Interest Rate																				

### 9.3.3 Estimated Advertisement Income

#### (1) Need for Advertisement Income

The Project that primarily aims at educational broadcasting for schools has a very strong public nature. Hence any advertisement broadcasting that disturbs education is not desirable. As pointed out in the Organization and Management Plan, subsidies from the National Treasury should be the main source of revenue for the operation of the broadcasting entity at initial stages.

However, the current finance of education, which ostensibly shows an increase, is actually stringent. For maintaining an adequate level and service for the future, it will be necessary to retrench expenses and make them effective. An educational broadcasting project is not an exception. It is necessary to secure sources of revenue within an extent not disturbing its public nature, considering a advertisement income as a source of revenue other than the subsidy from the National Treasury so that a burden on the government's finance will be reduced.

After Full-Scale Phase, the broadcasting entity will start to seek self financed operation. In case advertisement income grows enough to finance the operating expense, reinvestment (replace facilities and equipment), the entity could be operated as a public corporation.

#### (2) Present Condition TV CM Broadcasting

Commercial TV stations in Paraguay all make advertisement incomes from private companies as their main source of revenue. It is said that private companies using TV or radio as their advertising media number approximately 300.

In Paraguay, a move for a consumer protection law has been made, and TV CM time for an hour cannot run for more than 12 minutes (20% of a program's broadcasting hours). In actuality, one spot CM lasts for 5 seconds to 60 seconds, or 20 seconds on an average. The CM rate is between Gs. 6,750 and Gs. 60,000 a second and hours between 6 p.m. and 11 p.m. are the highest CM rate hours.

Table 9.3.3.1 CM Charge per Second in Guarani

Time zone	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24
Unit Charge	6,750			25,000			6,750			35,000			60,000		

In this connection, in the South American countries, it is common that national broadcasting stations make their advertisement income (ad income) their sources of revenue (Table 9.3.3.2).

Table 9.3.3.2 Source of Revenue of Broadcasting Stations in South American Countries

Nation	Nation Broadcasting Station's Sources of Revenue
Peru	Ad income
Columbia	Ad income (Public funds in part)
Chile	Ad income
Dominica	Ad income (80%) + National Treasury's subsidy
Panama	National subsidy
Mexico	Ad income + National Treasury's subsidy
Bolivia	Ad income (65%) + National Treasury's subsidy
Argentina	Ad income
Brazil	National Treasury and State Government's subsidy

(3) Estimated Ad Income

The ad income for this project was estimated as follows:

- a) Ad income is based on the rate of a short spot CM, which is put in station break, for this project.
- b) Government's PR, such as traffic safety, nature conservation, ad elections etc., are also information advertisements for the public, so that these are regarded here as chargeable.

- e) For educational programs for schools, no spot CMs are considered as a rule, for some of them may disturb school education, and CMs are considered only for educational and cultural broadcasting for general public.
- d) For the nature of this project, CMs can run for 6 minutes (10 percent) or less an hour to keep them from being run for too long.
- e) Government's PRs are estimated on a half basis, and supposed be broadcast in public information hours.
- f) Government's PRs are presumed to be charged only for evening broadcasting and in case broadcast in other time zone than public information hours, they are to be charged as commercial Ad.
- g) The unit charge is set lower than the private one, for it is impossible to run like private broadcasting stations at the outset.  
Two cases are set as follows in consideration of coverage and operational capability.

Table 9.3.3.3 Cases for the Ad income Estimation

	Unti Ad Charge (% to Commercial Broadcasting St.)		
	Full-Scale 1	Full-Scale 2	Integrated
Case A	30%	60%	90%
Case B	50%	75%	100%

Table 9.3.3.4, Table 9.3.3.5 and Table 9.3.3.6 show programs' CM Broadcasting Time Zones, Table 9.3.3.7, CM broadcasting hours by programs type a week, and Table 9.3.3.8, the unit price of CM.

Table 9.3.3.4 CM Broadcasting Time Zones (Full-Scale, 1999 ~ 2001)

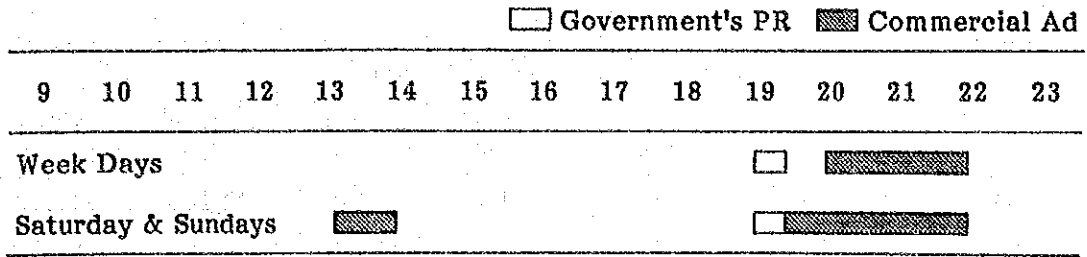


Table 9.3.3.5 CM Broadcasting Time Zones (Full-Scale, 2002 ~ 2004)

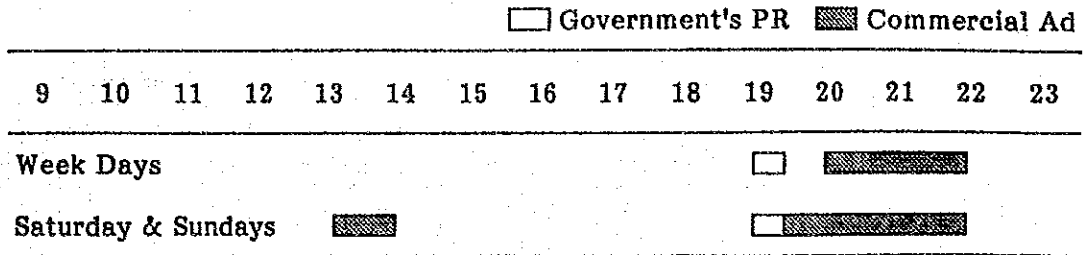


Table 9.3.3.6 CM Broadcasting Time Zones (Integrated, 2002 ~)

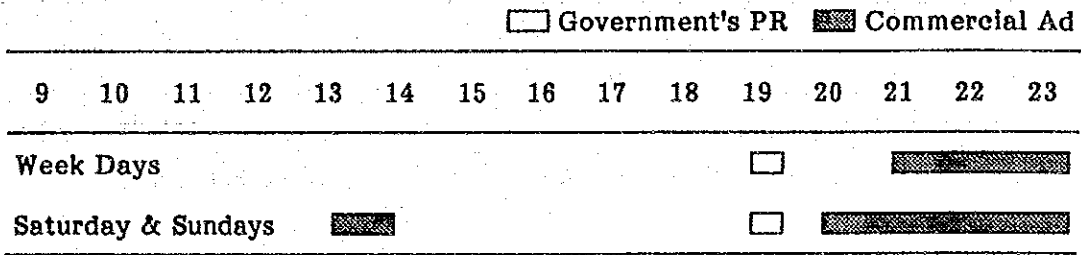


Table 9.3.3.7 Weekly Broad Casting Hours by Program Type (in minute)

	Full-Scale 1		Full-Scale 2		Integrated	
	General Public	Public Information	General Public	Public Information	General Public	Public Information
12:00 ~ 15:00	90	0	90	0	90	0
15:00 ~ 18:00	0	0	0	0	0	0
18:00 ~ 20:00	60	210	120	210	120	210
20:00 ~ 23:30	840	0	1,155	0	945	0
<b>Total</b>	<b>990</b>	<b>210</b>	<b>1,365</b>	<b>210</b>	<b>1,155</b>	<b>210</b>

Table 9.3.3.8 Unit Charge of Advertisement (per second in Guarani)

(Case-A)

	Full-Scale 1		Full-Scale 2		General Public	Public Information
	General Public	Public Information	General Public	Public Information		
12:00 ~ 15:00	7,500	3,750	15,000	7,500	22,500	11,250
15:00 ~ 18:00	2,025	1,013	4,050	2,025	6,075	3,038
18:00 ~ 20:00	10,500	5,250	21,000	10,500	31,500	15,750
20:00 ~ 23:30	18,000	9,000	36,000	18,000	54,000	27,000

(Case-B)

	Full-Scale 1		Full-Scale 2		Integrated	
	General Public	Public Information	General Public	Public Information	General Public	Public Information
12:00 ~ 15:00	12,500	6,250	18,750	9,375	25,000	12,500
15:00 ~ 18:00	3,375	1,688	5,063	2,531	6,750	3,375
18:00 ~ 20:00	17,500	8,750	26,250	13,125	35,000	17,500
20:00 ~ 23:30	30,000	15,000	45,000	22,500	60,000	30,000

Under the conditions specified above, the advertisement income in case A and in case B is estimated to reach at US\$ 11.0 million and US\$ 12.2 million respectively in integrated phase annually, as shown on Table 9.3.3.9.

Table 9.3.3.9 Annual Advertisement Income (in thousand US\$)

(Case-A)

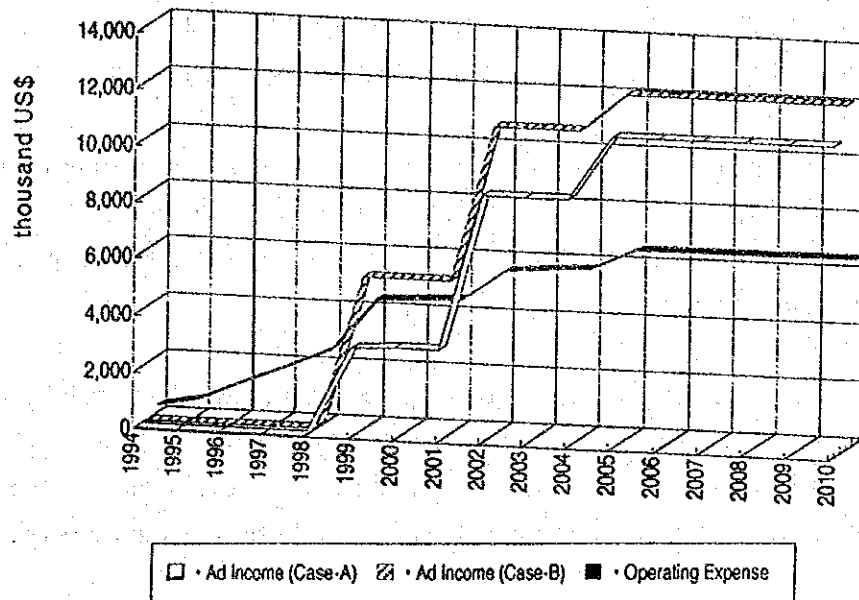
	Full-Scale 1	Full-Scale 2	Integrated
Commercial Ad	3,014	8,341	10,431
Government's PR	202	405	607
<b>TOTAL</b>	<b>3,217</b>	<b>8,746</b>	<b>11,038</b>

(Case-B)

	Full-Scale 1	Full-Scale 2	Integrated
Commercial Ad	5,024	10,427	11,590
Government's PR	337	506	674
<b>TOTAL</b>	<b>5,361</b>	<b>10,933</b>	<b>12,264</b>



Figure 9.3.3.1 Change in the Operation Cost and the Advertisement Income



The FIRR (OI) (financial interval rate of return on total investment) in each case is shown in Table 9.3.3.10. These FIRRs show that the project is not financially feasible in the sense of commercial business or certain amount of subsidy and/or very soft loan will be necessary.

Table 9.3.3.10 Financial Internal Rate of Return

Financial Internal Rate of Return on Total Investment*	
Case 1-A	- 2.45 %
Case 1-B	+ 2.48 %
Case 2-A	- 2.45 %
Case 2-B	+ 2.48 %

\* Here, to clarify the rentability of the project itself, Financial Internal Rate of Return On total Investment (FIRROI) is calculated. As given in the following formula, FIRROI is not affected by interest of loan.

$$\sum_{t=1}^T \frac{I_t}{(1+r)^t} = \sum_{t=1}^T \frac{B_t - C_t}{(1+r)^t}$$

Here,  $I_t$  : Investment in year t  
 $B_t$  : Advertisement Income in year t  
 $C_t$  : Running Cost in year t  
 $T$  : Period (17 years)  
 $r$  : FIRROI

Tables 9.3.3.11 ~ 9.3.3.14 show a cashflow estimated in the same manner as above, with advertisement income included. Advertisement income will help save the subsidy of the National Treasury by US\$ 102 (case A) or US\$ 122 million (case B) during the period of the Master Plan (17 years).

Based on the above estimation of ad income and assumptions on the condition for long term loan, necessary amount of subsidy from National Treasury is computed. As shown in Figure 9.3.3.2, form National Treasury is largely reduced in any case.

In most case, except Case 1-B however, subsidy will be required even after 2002. In 2008, the year for the replacement of electric equipment, US\$ 10 to US\$ 4 million of subsidy is necessary. In Case 1-B, self-financing operation will be possible, i.e., the broadcasting body will be able to be a public corporation.

Figure 9.3.3.2 Necessary Subsidy (with Ad Income)

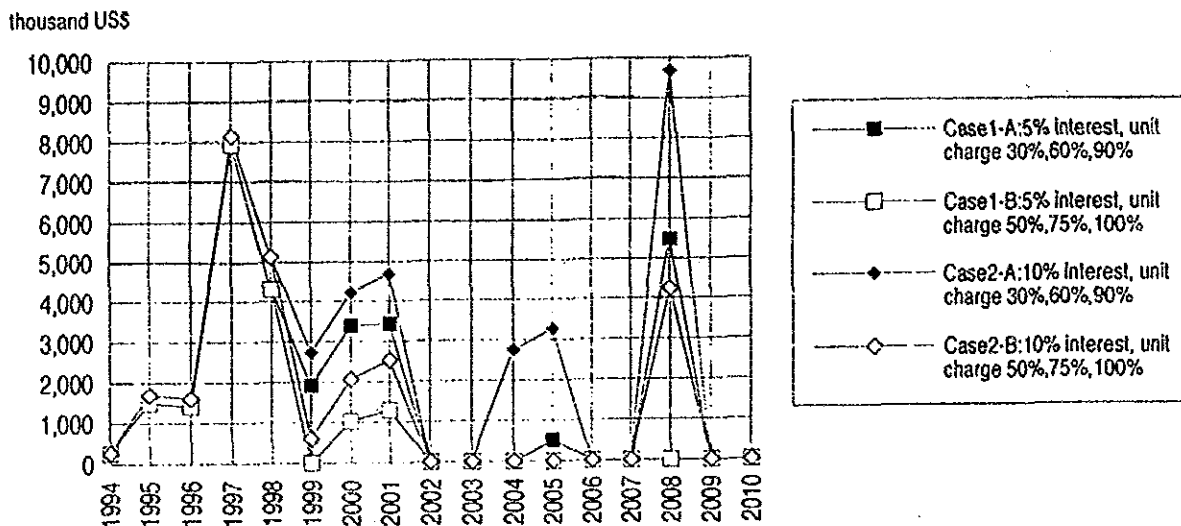


Table 9.3.3.11 Cash Flow of the Broadcasting Entity (Case-1-A) (in thousand US\$)

	Prep.	Introduction Phase					Full-Scale Phase I					Full-Scale Phase II					Integrated Phase				
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Accum. Ave.		
CASH BALANCE, BEGINNING	0	0	0	0	0	0	0	0	0	1,775	2,888	1,227	0	1,854	3,772	0	1,647				
<b>CASH INFLOW</b>																					
- Foreign Loan	4,025			421	11,950		89	8,753			8,347							33,586	1,976		
- Advertisement Income						3,217	3,217	3,217	8,746	8,746	8,746	11,038	11,038	11,038	11,038	11,038	11,038	11,038	102,117	6,007	
- Subsidy	268	1,492	1,405	7,926	4,304	1,912	3,397	3,432	0	0	0	513	0	0	5,483	0	0	30,132	1,772		
<b>Total Cash Inflow</b>	<b>268</b>	<b>5,517</b>	<b>1,405</b>	<b>8,347</b>	<b>16,254</b>	<b>5,129</b>	<b>6,703</b>	<b>15,402</b>	<b>8,746</b>	<b>8,746</b>	<b>17,093</b>	<b>11,551</b>	<b>11,038</b>	<b>11,038</b>	<b>16,521</b>	<b>11,038</b>	<b>11,038</b>	<b>165,835</b>	<b>9,755</b>		
<b>CASH OUTFLOW</b>																					
- Construction Expenditure																					
- Foreign	4,025			421	11,950		89	8,753			8,347	3,654			10,343			97	47,660	2,805	
- Local	738			5,903	1,029	1,228	753			2,313	315				892			8	13,179	775	
- Operating Expense	268	552	1,204	1,801	2,455	4,309	4,370	4,453	5,518	5,624	5,708	6,460	6,460	6,460	6,460	6,460	6,460	6,460	75,023	4,413	
- Amortization of Loans																					
- Principal							201	201	222	820	820	824	1,262	1,262	1,262	1,679	1,862	10,416	613		
- Interest		201	201	222	820	820	814	1,242	1,231	1,190	1,566	1,525	1,462	1,399	1,336	1,252	1,158	15,438	967		
<b>Total Cash Outflow</b>	<b>268</b>	<b>5,517</b>	<b>1,405</b>	<b>8,347</b>	<b>16,254</b>	<b>5,129</b>	<b>6,703</b>	<b>15,402</b>	<b>6,971</b>	<b>7,633</b>	<b>18,753</b>	<b>12,778</b>	<b>9,184</b>	<b>9,121</b>	<b>20,292</b>	<b>9,391</b>	<b>9,585</b>	<b>162,735</b>	<b>9,573</b>		
<b>NET CASH INFLOW</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,775</b>	<b>1,113</b>	<b>-1,661</b>	<b>-1,227</b>	<b>1,854</b>	<b>1,917</b>	<b>-3,772</b>	<b>1,647</b>	<b>1,453</b>				
<b>CASH BALANCE END</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,775</b>	<b>2,888</b>	<b>1,227</b>	<b>0</b>	<b>1,854</b>	<b>3,772</b>	<b>0</b>	<b>1,647</b>	<b>3,100</b>				
<b>ACCUMULATED SURPLUS/DEFICIT</b>	<b>-4,025</b>	<b>-4,025</b>	<b>-4,446</b>	<b>-4,446</b>	<b>-16,396</b>	<b>-16,396</b>	<b>-16,284</b>	<b>-24,836</b>	<b>-22,839</b>	<b>-20,907</b>	<b>-30,094</b>	<b>-30,497</b>	<b>-27,381</b>	<b>-24,201</b>	<b>-26,711</b>	<b>-23,385</b>	<b>-20,070</b>				
Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)																					
Interest Rate 5%																					

Table 9.3.3.12. Cash Flow of the Broadcasting Entity (Case-1-B) (in thousand US\$)

	Prep.	Expen.	Introduction Phase				Full-Scale Phase I				Full-Scale Phase II				Integrated Phase				2010 Accum. Ave.
			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
CASH BALANCE, BEGINNING	0	0	0	0	0	0	232	0	0	3,962	7,262	7,788	7,274	10,354	13,498	5,469	8,342		
CASH INFLOW																			
- Foreign Loan	4,025		421	11,950		89	8,753				8,347						33,586		
- Advertisement Income					5,361	5,361	5,361	10,933	10,933	10,933	10,933	12,264	12,264	12,264	12,264	12,264	12,264		
- Subsidy	268	1,492	1,405	7,926	4,304	0	1,021	1,288	0	0	0	0	0	0	0	0	0		
Total Cash Inflow	268	5,517	1,405	8,347	16,254	5,361	6,471	15,402	10,933	10,933	19,280	12,264	12,264	12,264	12,264	12,264	173,756		
CASH OUTFLOW																			
- Construction Expenditure																			
- Foreign	4,025		421	11,950		89	8,753				8,347	3,654			10,343		97		
- Local	738		5,903	1,029		1,228	753				2,313	315			992		8		
- Operating Expense	268	552	1,204	1,801	2,455	4,309	4,370	4,453	5,518	5,624	5,708	6,460	6,460	6,460	6,460	6,460	6,460		
- Amortization of Loans																			
- Principal																			
- Interest		201	201	222	820	820	814	1,242	1,231	1,190	1,586	1,525	1,462	1,399	1,336	1,252	1,158		
Total Cash Outflow	268	5,517	1,405	8,347	16,254	5,129	6,703	15,402	6,971	7,633	18,753	12,778	9,184	9,121	20,292	9,391	9,585		
NET CASH INFLOW	0	0	0	0	0	232	-232	0	3,962	3,300	526	-514	3,080	3,143	-8,028	2,873	2,679		
CASH BALANCE END	0	0	0	0	0	232	0	0	3,962	7,262	7,788	7,274	10,354	13,498	5,469	8,342	11,021		
ACCUMULATED SURPLUS/DEFICIT	-4,025	-4,025	-4,445	-16,396	-16,164	-16,284	-24,936	-20,952	-15,533	-23,533	-23,223	-18,881	-14,475	-21,242	-16,689	-12,149			
Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)																			
Interest Rate																			

Table 9.3.3.13 Cash Flow of the Broadcasting Entity (Case-2-A) (in thousand US\$)

	Prep. 1994	Introduction Phase			Full-Scale Phase I			Full-Scale Phase II			Integrated Phase				2010 Accum. Ave.		
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007		2008	2009
CASH BALANCE, BEGINNING	0	0	0	0	0	0	0	0	544	467	0	0	393	911	0	396	
CASH INFLOW																	
• Foreign Loan	4,025		421	11,950		89	8,753			8,347						33,586	
• Advertisement Income					3,217	3,217	3,217	8,746	8,746	8,746	11,038	11,038	11,038	11,038	11,038	11,038	102,117
• Subsidy	268	1,693	1,607	8,149	5,124	2,732	4,211	4,674	0	2,759	3,265	0	0	9,679	0	44,160	
Total Cash Inflow	268	5,718	1,607	8,570	17,074	5,949	7,517	16,644	8,746	19,852	14,303	11,038	11,038	20,717	11,038	179,863	
CASH OUTFLOW																	
• Construction Expenditure																	
- Foreign	4,025		421	11,950		89	8,753			8,347	3,654			10,343		47,680	
- Local	738		5,903	1,029		1,228	753			2,313	315			892		13,179	
• Operating Expense	268	552	1,204	1,901	2,455	4,309	4,453	5,518	5,624	5,708	6,460	6,460	6,460	6,460	6,460	75,023	
• Amortization of Loans																	
• Principal						201	201	222	820	820	824	1,262	1,262	1,262	1,679	1,862	
• Interest						1,640	1,628	2,484	2,461	2,379	3,192	3,050	2,923	2,797	2,671	2,503	
Total Cash Outflow	268	5,718	1,607	8,570	17,074	5,949	7,517	16,644	8,202	8,823	20,319	14,303	10,645	10,519	21,628	10,744	
NET CASH INFLOW	0	0	0	0	0	0	0	0	544	-77	-467	0	393	519	-911	396	
CASH BALANCE END	0	0	0	0	0	0	0	0	544	467	0	0	393	911	0	396	
ACCUMULATED SURPLUS(DEFICIT)	-4,025	-4,025	-4,446	-16,396	-16,396	-16,284	-24,636	-24,070	-23,327	-31,321	-30,497	-28,842	-27,062	-26,711	-24,636	-22,460	
Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)																	
Interest Rate																10%	

Table 9.3.3.14 Cash Flow of the Broadcasting Entity (Case-2-B) (in thousand US\$)

	Prep. 1994	Introduction Phase				Full-Scale Phase I				Full-Scale Phase II				Integrated Phase			
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CASH BALANCE, BEGINNING	0	0	0	0	0	0	0	0	2,731	4,841	3,802	1,763	3,381	5,126	0	1,622	
CASH INFLOW																	
- Foreign Loan	4,025		421	11,950		89	8,753										33,586
- Advertisement Income					5,361	5,361		10,933	10,933	10,933	12,264	12,264	12,264	12,264	12,264	12,264	122,466
- Subsidy	268	1,693	1,607	8,149	5,124	588	2,067	2,530	0	0	0	0	0	4,238	0	0	26,263
Total Cash Inflow	268	5,718	1,607	8,570	17,074	5,949	7,517	16,644	10,933	19,280	12,264	12,264	12,264	16,502	12,264	12,264	182,315
CASH OUTFLOW																	
- Construction Expenditure																	
- Foreign	4,025		421	11,950		89	8,753			8,347	3,654			10,343		97	47,680
- Local	738		5,903	1,029		1,228	753			2,313	315			892		8	13,179
- Operating Expense	268	552	1,204	1,801	2,455	4,309	4,370	4,453	5,518	5,624	5,708	6,460	6,460	6,460	6,460	6,460	75,023
- Amortization of Loans																	
- Principal							201	201	222	820	820	824	1,262	1,262	1,679	1,862	10,416
- Interest							1,628	2,484	2,461	2,379	3,132	3,050	2,923	2,797	2,671	2,503	32,876
Total Cash Outflow	268	5,718	1,607	8,570	17,074	5,949	7,517	16,644	8,202	8,823	20,319	14,303	10,645	10,519	21,628	10,642	179,173
NET CASH INFLOW	0	0	0	0	0	0	0	0	2,731	2,110	-1,040	-2,039	1,619	1,745	-5,126	1,622	1,520
CASH BALANCE END	0	0	0	0	0	0	0	0	2,731	4,841	3,802	1,763	3,381	5,126	0	1,622	3,142
ACCUMULATED SURPLUS(DEFICIT)	-4,025	-4,025	-4,446	-16,396	-16,396	-16,284	-24,836	-21,883	-18,953	-27,520	-28,734	-25,854	-22,847	-26,711	-23,410	-20,028	
Foreign Loan : Lending Term 20 years (including 5 year Grace-Period)																	
Interest Rate																	10%

#### 9.3.4 Appropriateness and Possibility of the Subsidy from the National Treasury

##### (1) Need and Appropriateness of the Subsidy from the National Treasury

As identified in the analysis, the broadcasting entity, in most cases, will depend on the Government for its investment fund and operating expense even in Integrated Phase, and the revenue by advertisement is not clear on its demand or accepted charges.

National Treasury should be appropriated from the viewpoint of the objectives, nature and socioeconomic effects to cover the deficit.

##### (2) Possibility of the Subsidy from the National Treasury

###### 1) Support by the People

Since education, especially basic education, benefits the entire nation directly, the people might understand the subsidy from the National Treasury as one of the appropriate uses of national taxes. This can be known from the fact that all candidate of Presidential candidate advocated importance of education in 1993.

###### 2) Possibility from National Financial Viewpoint

Budgetary trends and contents of relevant sector of the Project, education sector and telecommunication sector, are reviewed below in the budget of the MEC and ANTELCO, the main executing agencies for the sectors.

First change in the total governmental budget is shown in Table 9.3.4.1. The budget grows much faster than inflation.

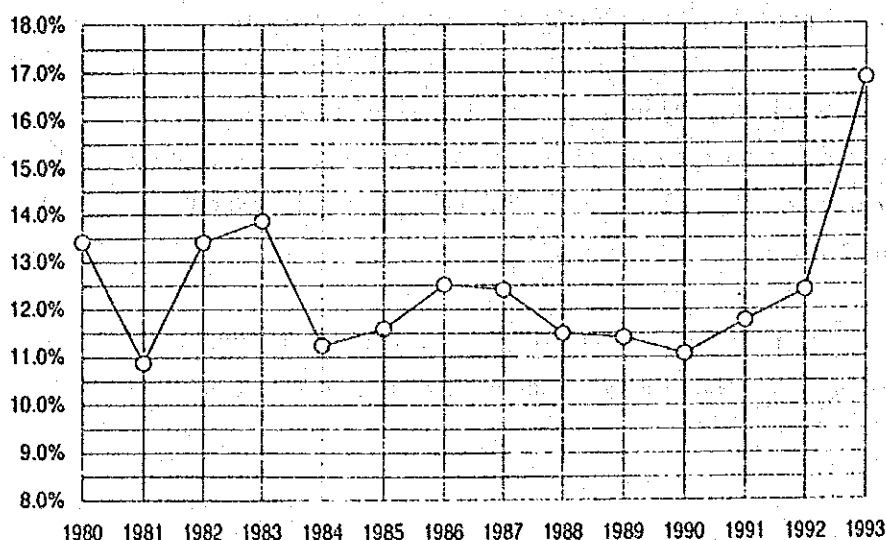
Table 9.3.4.1 Budget of the Government

	1989	1990	1991	1992
Budget in million Guaraní	456,055	695,702	1,247,249	2,014,958
(Increase to the previous year)	66.7%	52.5%	79.3%	61.6%
Budget in thousand US\$*	398,301	565,519	939,901	1,334,409
(Increase to the previous year)	35.9%	42.0%	66.2%	42.0%
Share to GDP	9.9%	10.7%	15.1%	20.8%
Increase in Consumer Price	26.0%	38.2%	24.3%	15.1%
Growth in GDP (Real) of Paraguay	5.8%	3.1%	2.5%	1.7%

\* Calculated in the average exchange rate of each year

In the expanding government budget, the share of MEC's budget to the total budget has increased rapidly, as shown in Figure 9.3.4.1 after 1990, showing the national policy which gives high priority to education. The new constitution, effective from 1992, stipulates that more than 20% of the government (excluding donation and loan) should be spent on education. Realization of the article is expected to occur in the near future. These trends give chances toward the implementation of the Master Plan.

Figure 9.3.4.1 Share of MEC's Budget to the Total Government Budget



(Note) 1980 ~ 1991 : Real Expenditure Base  
 1992, 1993 : Budget Base



As shown in Table 9.3.4.2, although, the budget of MEC in 1992 reached US\$ 165 million, 81.5% of the total, US\$ 135, was personal expenditure and 89.3%, US\$ 148 million, was current expenditure. Capital expenditure shared only 10.7%, as little as US\$ 18, and no large change in the proportion took place recently.

Table 9.3.4.2 Budget of the MEC by Purpose (1992)

	Current Expend.		Capital Expend.	Total Budget
	Personnel (%)	Other Expend. (%)	(%)	(%)
	203,657 (81.5%)	19,480 (7.8%)	26,611 (10.7%)	249,748 (100.0%)
(in thousand US\$)	(134,872)	(12,901)	(17,623)	(165,396)

On the other hand, more than half of the budget of ANTELCO was for the capital expenditure in 1992.

Table 9.3.4.3 Budget and Execution of ANTELCO (1992)

	(Unit: Million Guarani)		
	Budget	Executed	Not Executed
Income	194,160	173,666	20,495
Donation	5,689	0	5,689
Income	16,944	16,944	0
Total Income	216,793	190,610	26,183
(in thousand US\$)	(143,572)	(126,232)	(17,340)
Current Expenditure	102,515	91,859	10,656
Capital Expenditure	114,174	97,281	16,893
Total Expenditure	216,689	189,140	27,550
(in thousand US\$)	(143,503)	(125,258)	(18,245)
Balance	104	1,470	
(in thousand US\$)	(69)	(974)	

Source: ANTELCO

Note: US\$1 = Gs. 1,510

Annual operation cost of the Project will reach to US\$ 6.5 million in maximum, corresponding to 2.9% of MEC's recurrent budget. Maximum construction cost will take place in 1998 and to be US\$ 13 million, accounting for 18.5% of the total of MEC's and ANTELCO's capital expenditure in 1992. Total capital investment for construction and replacement up to 2010 will reach to US\$ 61 million, capital investment for 0.9 year of the two organization.

#### 9.3.5 Result of the Analysis

From the above-mentioned conditions, high possibility can be expected for the subsidy from the National Treasury to fulfill the gap between the required cost and ad in come, especially for current expenditure. Further more, it should be reminded that for the personal expenditure of existing staff, such as persons from MEC, will not cause actual increase in the government budget.

As for the investment cost, although the budget for the MEC is growing rapidly, the large scale of capital cost can not be expected from the budget through the MEC, and the source should also be sought in the budget of MOPC or ANTELCO.

Even though these organization have large amount of investment budget, the government budget for capital investment is usually executed only less than half portion and ANTELCO borrows loans form foreign or international organization in case of large investment.

For capital investment of the Project, financial assistances by foreign countries or international organizations with favorable conditions will be necessary to reduce intensive burden on the government capital budget.

On reinvestment cost, actual replacements of equipment will not occur simultaneously as set in the estimation. The cost will not take place so intensively as appears in the estimated figures. The scatter will make possible for the estimated the ad income and subsidy to cover the cost for reinvestment.

## CHAPTER 10 IMPLEMENTATION PLAN

Figure 10.1 shows the implementation plan for the Master Plan.

For five years before the completion of the new ETV Center at ISE site, all the preparatory activities before the commencement of the full-scale broadcasting service will be carried out at the provisional headquarters building located at the Department of Tele-education of MEC in Don Bosco, Asuncion.

In Figure 10.1, major activities of the project as mentioned below are arranged year by year for each stage of the development at phases.

- a) Plans and targets for each development phase
- b) Broadcast programs
- c) Number of programs produced
- d) Number of producers and technical staff
- e) TV Program production facilities
- f) TV Transmitting facilities
- g) Facilities construction work
- h) Coverage area
- i) Project Cost
  - Construction costs
  - Annual operating expenses
  - Advertising Revenue
  - Balance
- j) Organization

Figure 10.1 IMPLEMENTATION PLAN

Years		1 (1994)	2 (1995)	3 (1996)	4 (1997)	5 (1998)	6 (1999)	7 (2000)	8 (2001)	9 (2002)	10 (2003)	11 (2004)	12 (2005)	13 (2006)	14 (2007)	15 (2008)		
Development Phases		Preparatory Phase	Experimental Phase	Introduction Phase			Full-scal Phae-1			Full-scal Phae-2			Integrated Phase					
Site of ETV HQ		Tentative ETV Center at MEC (Don Bosco)					New ETV Center at ISE Site											
P L A N  C O N T E N T S	Plans Targets	Various Councils Committees	VCR CATV of Test	Explemental Broadcast			Short-term Plan											
	Broadcast Programs	Prod. of Experiment Prog.	Prod. of Experiment Prog.	1. Obtaining evaluation from rural and urbun areas 2. Promotion of model school education 3. Public program from Government 4. Programs for General 5. Raising capability of staff 6. Advance Production for Full scale phase			Primary school	1000programs	Mid-term Plan									
		Training staff	Training staff				Pre-primary school	200programs	Long-term Plan									
		Research Develop of Utilization	Research Develop of Utilization				Teachers'	200programs	Secondary school		400programs							
							Literacy	200programs	Music	350programs	Correspondence secondary school		400programs					
No. of Programs	50	160	480	640	800	1000												
S T A F F	No. of Producers	8	11	15	26	32	50			55			60					
	No. of Technical Staff	10	22	45	63	80	93			130			140					
F A C I L I T I E S	TV Studios	MEC Studio			Operation in the ETV Center													
	TV Transmitters	IPT Studio			major equip. TV studio 2 rooms Post prod. 2 rooms M.C.R. TV OB van													
C O N S T. W O R K	Contents of Construction Works	TV Transmitter	3 Regional Station			Ciudad del Este Encarnacion Billarrica												
		Studio Equip.	Asuncion Transmitter, ETV Center at ISE			9 1st Plan Stations			9 2nd Plan Stations			10 2nd Plan Stations		10 2nd Plan Stations				
	Coverage Area	Asuncion CATV	40%			62%			84%			94%						
P r o j e c t  c o s t s	Construction Cost	Work 1 4.7	Work 2 6.3 13.0			Work 3 1.3 9.5			Work 4 10.6		Renewal of Equip. 4.0							
	annual operating expenses	0.3	0.6	1.2	1.8	2.5	4.3	4.4	4.5	5.5	5.6	5.7	6.5	6.5	6.5	6.5		
	Advertising Revenue	-	-	-	-	-	3.2	3.2	3.2	8.7	8.7	8.7	11.0	11.0	11.0	11.0		
	Balance	Δ0.3	Δ5.3	Δ1.2	Δ8.1	Δ15.5	Δ1.1	Δ2.5	Δ10.8	3.2	3.1	Δ7.6	0.5	4.5	4.5	4.5		
	Organization	Joint op. body			Independent decentralized government entity (ex. Asuncion University)							Public Corporation						

**PART III**

**FEASIBILITY OF PRIORITY PROJECT**

## CHAPTER 1 THE PRIORITY PROJECT

### 1.1 Objective and Methodology of Feasibility Study

The objective of the feasibility study is to verify of the technical, socioeconomic and financial appropriateness of the Priority Project which is comprised of the following programs:

- a) School Broadcasting for Primary Education
- b) Educational Broadcasting for Teacher Training
- c) Social Broadcasting for the Socially Weak/Disadvantaged
- d) Educational and Cultural Broadcasting for the General Public

The positions of the above-stated programs within the Master Plan are as illustrated in Figure 1.1.1.

Figure 1.1.1 Priority Project and Master Plan

		Stage of School Education			Specified Public		General Public
		Primary	Secondary	Teacher Training	Socially Weak	Specific Users	
School Education Broadcasting	School Education	a)		b)			
	Correspondence Courses			b)			
Social Education Broadcasting					c)		d)

Priority Program of Master Plan  
 Other Programs

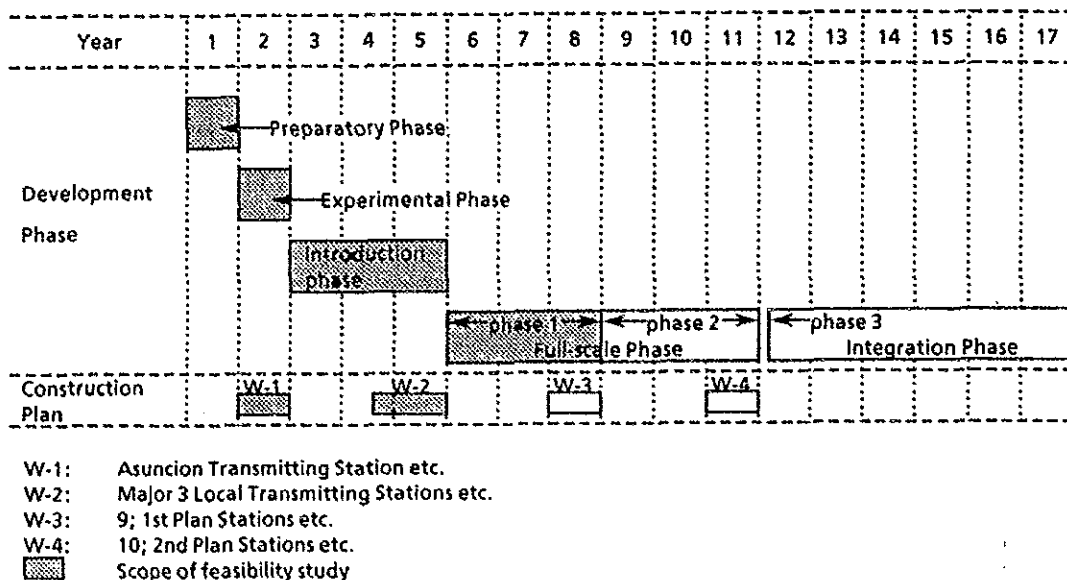
The present Priority Project is an independent project and is the first step towards the full achievement of the ultimate goals of the Master Plan. Consequently, the feasibility study was conducted to clarify the planning contents of the Priority Project proposed by the Master Plan. and included supplementary surveys and studies designed to enable more detailed analysis.

## 1.2 Scope of the Priority Project

It is particularly important to note the need for gradual development, i.e. the adoption of a preparatory phase, an experimental phase and an introduction phase prior to full-scale broadcasting. Gradual development is essential for steady successful implementation of the Master Plan with maximum benefits and for the promotion of utilization of educational TV broadcasting as advocated by the development plan in the Master Plan.

Consequently, this report proposes that the project period of the feasibility study shall include the full-scale phase (phase 1) as well as preparatory phases such as the preparation, experimental and introduction phases, as shown in Figure 1.2.1. This report therefore provides a detailed description of not only the planning contents for full-scale phase 1, but also for the programming of the introductory phases.

Figure 1.2.1 Scope of the Priority Project



## CHAPTER 2 PROGRAM DEVELOPMENT

### 2.1 Development Plan for the Initial Preparation Period

#### 2.1.1 Preparatory Phase (1st year)

The preparatory phase, which is the initial year of efforts to start the educational broadcasting, is an important stage when basic preparations shall be made for the operation of a broadcasting station. In the preparatory phase, the following steps will be taken while making various trials keeping in close touch with the Councils, and Committees.

##### (Tasks in the Preparatory Phase)

At primary schools, 200 days of classes are given a year at the rate of 4 hours a day according to the prescribed curriculum, number of class hours for each subject and the contents of guidance for each subject. In order to incorporate educational broadcasting, non-existent before, to the existing educational curriculum, there is the need of devising broadcast programs to meet the educational curriculum. At the start of broadcast of programs to primary schools, priority will be given to this point.

The following items are to be examined on the viewpoints mentioned below.

- a) Examination on educational curriculum and suitable programs for primary schools.
- b) Production of experimental programs for the 1st to 3rd graders on communication, etc.
- c) Training of production personnel for educational programs.
- d) Research and development of utilization of educational programs at schools.
- e) Production of PR programs for, and publicizing of, educational broadcasting.



Number of programs to be produced        50  
Production cost (per program)            US\$400  
Number of PDs required                    8

The production span will be reduced from the present 30 days to 20 days.

The studio-production crew shall be 1 crew (10 members)

Two studios will be used; one MEC studio and one former IPT studio.

**(1) Educational Curriculum and Programs for Primary Schools**

When education by broadcasts is added to the systematically-formed educational plans for primary schools, effective utilization of broadcasts cannot be brought to reality unless the utilization of broadcast programs is firmly positioned and program planning is made accordingly. Furthermore, it is necessary to examine thoroughly as to which part of the annual teaching plans should be filled with what types of programs.

**(2) Production of Experimental Programs for the 1st to 3rd Graders; communication, etc.**

As experimental educational programs, communication for the 1st to 3rd graders at primary schools and programs on different subjects for up to the 3rd graders will be produced. The following are the program specifications:

- a) Program Titles : Communication (national languages), etc.
- b) Target Audience : 1st to 3rd graders at primary schools
- c) Duration : 20 minutes
- d) Format : Direct teaching, with one teacher and 1-2 guests.
- e) Production Form : Studio production (completing the production in the studio)
- f) Viewing at the Schools  
: Have the programs viewed at the schools by VCR or on CATV and obtain evaluations.

g) Evaluation Feedback

: Evaluations by schools will be used effectively in the succeeding program production.

h) Problems in the Production

: Treatment of the dual language (Spanish and Guarani).

Production of, and research on, supplementary teaching materials.

(3) Training of Production Personnel for Educational Programs

Many of the educational programs are 20-30 minutes in duration, and large number of programs are required. And since the program budgets are restricted, the operation will not pay unless the program production is conducted efficiently. In order to ensure efficient program production, the production personnel must be so trained as to be able to complete the videotaping in 20 minutes when they are producing a 20-minute program (straight videotaping, that is, without stopping the VTR frequently as is necessary in the case of videotaping by cuts). With that method, the use of a studio can be kept short and the length of work time of the production personnel can also be minimized. So, it is an efficient method of program production. This presentation style in program production is suited to a lecture program with a teacher talking in a way similar to classroom-teaching. Appearance of 1-2 guests and insertion of VTR segments are also possible, so it is a mainstream production method in educational program. Since, in this presentation method, the program production runs smoothly without a hitch for 20 minute under the direction of a PD, it is imperative that the entire production team, including cameraman, soundman and switcher, should be highly skilled in the program-production work.

(4) Research and Development of Utilization of Educational Programs at Schools

In order to ensure effective utilization of educational programs at schools, researches in stages are essential. Research will be made on how to install a TV receiver in a classroom and how to utilize broadcasts in lower-grade classrooms.

1) Where should a TV receiver be installed?

Broadcasts cannot be utilized without a TV receiver, but it is difficult to install more than one from the beginning.

If there was only one TV receiver available, where should it be installed?

- a) There would be no problem if there were a library or any other large room, as the TV receiver may be installed there.
- b) If there were no large room, can't it be installed in the schoolmaster's office?
- c) If the schoolmaster's office were also too small for the purpose, it may be installed in the 6th grader's classroom. Being the highest graders, they would be sensible enough to move from one classroom to another quickly without confusion.

2) Position of a TV Receiver

- a) A place where the TV screen is not obscured by the incoming light from a window.
- b) A position visible by all the pupils in the classroom.
- c) Don't install a TV receiver too high up from the floor.
- d) The sound volume should be optimized.

3) Program Utilization by Lower Graders

When using a program, either on VCR or CATV, do not explain the contents of the program in advance. As to the viewing attitude, too, do not say to the pupils, "Watch the TV quietly without talking." This is because the first impression one receives from a program is important. Especially in the case of lower-graders, they normally express themselves in words or reveal their honest feelings. That is where the importance of broadcast-utilization lies. The teachers in the classrooms are then advised to take notes of what the pupils have uttered during the viewing of the TV and develop discussions in the post-viewing studies in the classroom.

## 2.2.2 Experimental Phase (2nd year)

The experimental phase is the period for the personnel to further develop their skills for the production of basic programs, the skills developed in the introductory phase. It is the phase in which the programs produced will be broadcast on CATV so as to verify the effectiveness of educational programs on classroom-teaching at the designated primary schools and also on general viewers. It also is the phase for increase and training of production personnel.

### (Tasks in the Experimental Phase)

During this phase, programs for the 4th to 6th graders at primary schools will be produced so that these programs may be broadcast in series on CATV for use by the teachers at the introductory part of their classes. The number of model schools using the programs will increase, thus adding to the importance of establishing the setup at the schools to facilitate the utilization of the broadcasts and also of giving necessary guidances to the teachers using the broadcasts in their class-rooms.

- a) Production of experimental programs:  
Science, mathematics and other programs for the 4th-6th graders at primary schools.  
Programs for teachers.
- b) Broadcasts on CATV at hours coinciding with classroom-teaching.
- c) Fostering and training of teachers.
- d) Testing of the system of program evaluation by the schools cooperating in the utilization of broadcasts.

Number of programs to be produced	: 160
Production Cost (per program)	: US\$400
Number of PDs Required	: 11
Production Span	: 10 days
Production Crews	: 2 crews (20 members)
Studios to be used	: The two studios mentioned earlier.

**(1) Production of Experimental Programs**

Science, mathematics and other programs will be produced for the 4th-6th graders at primary schools. Experimental programs for teachers will also be produced with the aim of improvement the quality of teachers.

**(2) Broadcasts on CATV at Hours Coinciding with the Classroom-teaching**

When a certain level has been attained in the stock of completed programs, the programs will be broadcast on CATV in their respective series at hours coinciding with the classroom-teaching to obtain the schools' evaluations.

**(3) Fostering and Training of Teachers**

In this experimental phase, the greatest efforts will need to be devoted to the improvement of the quality of teachers.

Keeping in close touch with ISE and regional education centers, production will be pushed ahead of such programs for teachers as a program presenting a model classroom-teaching by an ISE teacher and a model classroom-teaching using a primary-school program by a teacher of one of the schools cooperating in the utilization of broadcasts. These programs, viewed on VCR or on CATV, will not only help improve the quality of teachers but will also be used in the establishment of teaching methods using broadcasts, the methods which will be discussed at the meetings held at various places in the country to study on the utilization of broadcasts at schools.

**(4) Evaluation Systems at Model Schools**

If the Evaluation systems of Model schools differ from school to school, the obtaining of fair evaluations of programs becomes difficult. Therefore, a standard evaluation system will be established so as to improve the evaluations by conducting a series of tests.

### 2.1.3 Introductory Phase (3rd, 4th and 5th years)

In the introductory phase, the programs will come to be transmitted by on-air broadcasts and, as a result, the area of broadcast-reception will expand and the number of monitoring schools will be increased, thus enabling obtaining evaluations from both the urban and rural districts. The number of general viewers will increase, and the production of general educational programs and the government's live public-relations programs will be conducted regularly, forming a system that leads to the full-scale educational broadcasting.

#### (Tasks in the Introductory Phase)

With the start of on-air broadcast of the programs, the audience will have grown remarkably both in size and quality. During this phase, various problems will have to be tackled and solved in order to ensure smooth transition to the full-scale broadcasting; difference between the urban and rural areas in the needs for educational broadcasting, how the information programs essential to daily life should be produced and broadcast, the need of advance-production of programs for broadcast in the full-scale broadcasting phase, and the strengthening of abilities of production personnel to enable them to cope with any situation.

- a) Evaluation will be obtained, in particular, from the rural regions where educational opportunities are scarce, as well as from the urban regions.
- b) Efforts will be made to foster model schools for broadcast-utilization so as to develop utilization of broadcasts.
- c) Government's public-relations programs will be produced.
- d) Educational and cultural programs for the general public will be produced.
- e) The abilities of production personnel will be strengthened.
- f) The 4th and 5th years will be devoted to advance-production of programs.

- (1) Evaluation will be obtained, in particular, from the rural regions where educational opportunities are scarce, as well as from the urban regions.

In order to achieve equality in educational opportunities, it is necessary to know what kinds of differences exist between the urban and rural regions. The problems of language and of life, whether the subject of a program is appropriate from a regional point of view, where should the levels of programs be placed now that the broadcast area has been expanded ---- these are some of the major themes to be dealt with in the 3rd year.

- (2) Efforts will be made to foster model schools for broadcast-utilization so as to develop utilization of broadcasts

With the start of on-air broadcast, the number of schools using broadcasts will increase. However, when it comes to introducing educational broadcasts into classroom-teaching for the first time, there are many things that are puzzling to those concerned. So, by commissioning some of the schools to cooperate as model schools utilizing broadcasts, studies will be conducted on the utilization of broadcasts in school education, the results of such studies will be conveyed to the late-comer user schools, and efforts will be made to promote utilization of broadcasts.

- (3) Government's public-relations programs will be produced

The government's public-relations activities are important for the people's daily lives. Up to this phase, a number of government's public-relations programs have been produced, such as, the "campaign program to prevent AIDS and narcotics," "program to prevent alcoholism" and "child-rearing program" of the Ministry of Health & Social Welfare, "program on prevention of parasites" of the Ministry of Agriculture and Livestock, "crime-prevention program" of the Police and "literacy education program" of the Ministry of Education and Culture. However, since the broadcasts in this phase are on-air broadcasts, their publicizing power is very strong. So, in this phase, emphasis will be placed on government's public-relations broadcasts in tackling program production.

(4) Educational programs for the general public will be produced

To this category belong the public-notice program broadcast in three time-frames a day and the live "wide" program dealing with government's public-relations bulletins, daily-life news, educational information and others. As both of the two are live broadcasts, it is necessary for the production personnel to become fully skilled both in presentation and technology during this period.

(5) The abilities of production personnel will be strengthened

With the increase in number and categories of the programs to be produced, the routine work becomes increasingly complex.

Unless one makes judgments within a brief moment and starts action immediately, it may become impossible to get the work done in time. Since the work of program production involves a large number of people, PDs are required to carry out the program production work smoothly by tactfully maintaining a link of cooperation among those people. For that purpose, too, it is necessary to strengthen the abilities of the production personnel. What is of primary importance is that the program script should be written by the PD him(her) self. Otherwise, the PD will be unable to have a grasp of the entire picture of the program production work and, consequently, may stumble in the process of work, losing the PD's independence. The writing of the script by the PD himself leads to the strengthening of his ability.

(6) The 4th and 5th years will be devoted to the advance-production of programs

With the start of full-scale broadcasting, a total of 1,000 programs a year will become necessary for the primary-school program category along. To this will be added 200 programs for the preschoolers, 200 for the teachers and 200 for literacy education, with the result that a total of 1,600 programs will be required for the regular programming alone. This means that the annual videotaping capacity of 800 programs cannot meet the requirement and advance-production will have to begin two years before.



Table 2.1.3.1 Program Production by Year

	3rd Year	4th Year	5th Year
<b>Program Production</b>			
Lecture program	480 programs	640 programs	800 programs
Live "Wide" program		156	365
Public notice		(1 program/day)	(2 programs/day)
		365	730
<b>Production Cost (per program)</b>			
Lecture program	400 US\$	400 US\$	400 US\$
Live "Wide" program		2,000	2,000
Public notice		400	400
<b>Number of PDs Required</b>			
Lecture program	15	26	40
Live "Wide" program	(15)	(16)	(20)
General program		(10)	(8)
<b>Production Span</b>			
Lecture program	5 days	5 days	5 days
Live "Wide" program		7 days	7 days
<b>Production Crew</b>	3 crews (30 persons)	4 crews (40 persons)	5 crews (50 persons)
<b>Remarks</b>	From this year, a daily 2-shift production system will be introduced into weekdays.	Number of PDs includes 10 to handle the live "wide" programs, public notices and news. There will be 156 live programs and 3 days weekly of test broadcasts. From this year, work will be started to produce programs for Saturday and Sunday evenings including live "Wide" programs.	Number of PDs includes 12 to handle live "wide" programs, public notices and news, and 8 to be trained to handle general programs for Saturdays and Sundays in the full-scale broadcasting phase. There will be 365 live programs. From this year, two programs will be produced every weekday. Program production will continue during the summer vacation as well.

## 2.2 Production for Full-scale Phase 1 (6th, 7th and 8th Years)

The program production during this period will be conducted as follows.

Table 2.2.1 Program Production by Year

	6th Year	7th Year	8th Year
<b>Program Production</b>			The same as in the 7th year
Lecture program	600 programs	600 programs	
Live "Wide" program	365 (3 programs/day)	365 (3 program/day)	
Public notice	1,095	1,095	
<b>Production Cost (per program)</b>			
Lecture program	400 US\$	400 US\$	
Live "Wide" program	2,000	2,000	
Public notice	400	400	
<b>Number of PDs Required</b>	50	50	
Lecture program	(24)	(24)	
Live "Wide" program	(17)	(17)	
General program	(9)	(4)	
Post-production (PP) room		(5)	
<b>Production Span</b>			
Lecture program	5 days	5 days	
Live "Wide" program	7 days	7 days	
<b>Production Crew</b>	5 crews (50 persons)	5 crews (50 persons)	
<b>Production Studio</b>	New ETV Center 2 studios + PP room	New ETV Center 2 studios + PP room	
<b>Remarks</b>	Personnel required for the operation of PP room and TV OB van (20)	Personnel required for the operation of PP room and TV OB van (20)	



## CHAPTER 3 FACILITIES ARRANGEMENT PLAN

### 3.1 Asuncion

#### (1) Transmitting Facilities Plan

##### (a) Transmitting Station Site

The location at the premises of ISE (teacher training school) was chosen as the transmitting station site so as to achieve same service area in comparison with the commercial TV station. (For details concerning site selection, please refer to the site selection section of the Master Plan report.)

The selected site has water supply and sewerage facilities, and is scheduled for the urban development plan. The area has a total space of 20,000 m<sup>2</sup>, and the transmitting station and the studio building can be built on the same site.

The altitude of the site is 150m which is 15~35m higher than other commercial broadcasting stations in Asuncion.

##### (b) Station Building

The construction of the transmitting station and the studio building have been separated in Experimental phase for the transmitter and Introduction phase for the studio.

Two buildings are planned to be built on the same site, and the transmitting station is built first. Thus, a 23 kV high tension transformer which can accommodate the load capacity of the studio building will be installed in the transmitting station. When the studio building will be constructed, it will be supplied with 220 volt output from the transmitting station.

The floor area of the transmitting station is designed to be 18m × 8m taking the above factors into consideration.

In addition, the transmitting station buildings shall be constructed below the antenna towers to make the feeder line length as short as possible. Above building shall be square.

The required floor space in the transmitting station buildings is as follows. In addition, the block plan for the transmitting station buildings is shown in Figure 3.1.1 and the floor plan in Figure 3.1.2.

Transmitter room	48.0 m <sup>2</sup>
Power reception & distribution room	48.0 m <sup>2</sup>
Generator room	48.0 m <sup>2</sup>
Office	11 m <sup>2</sup>
Restrooms, hot water heaters	16 m <sup>2</sup>
Blower room	5.0 m <sup>2</sup>
Total	176 m <sup>2</sup>

(c) Antenna Tower

An antenna tower with a height of 160m will be newly constructed in order to cover the San Lorenzo, Villa Elisa, Emboscada, and Nueva Italia service area. However, the 160m high above ground level exceeds the ICAO regulations by 55m, since permission of the DINAC (National Public Aviation Bureau) was needed, permission was obtained in early June.

Furthermore, the antenna towers can be obtained in Paraguay, which type is guy wire type triangular trusses at less cost than self-supporting antenna towers. Because they use low USA channels of VHF band, the triangular trusses must be made 1.8m wider.

(d) TV Transmitting Equipment and Transmitting Antenna

Transmitter output is 10 KW (CH-6), the antenna type is a 2D antenna with 3 faces 6 stages and 1 face 2 stages. Maximum ERP (effective radiated power) is 90 KW (maximum antenna gain 9.5 dB). With this transmission scale, Asuncion as capital city, as well as Central, Paragari, Cordillera Province, plus a part of Presidente Hayes province can be served.

Figure 3.1.1. Schematic Layout of Broadcasting Facilities in Introduction Phase.

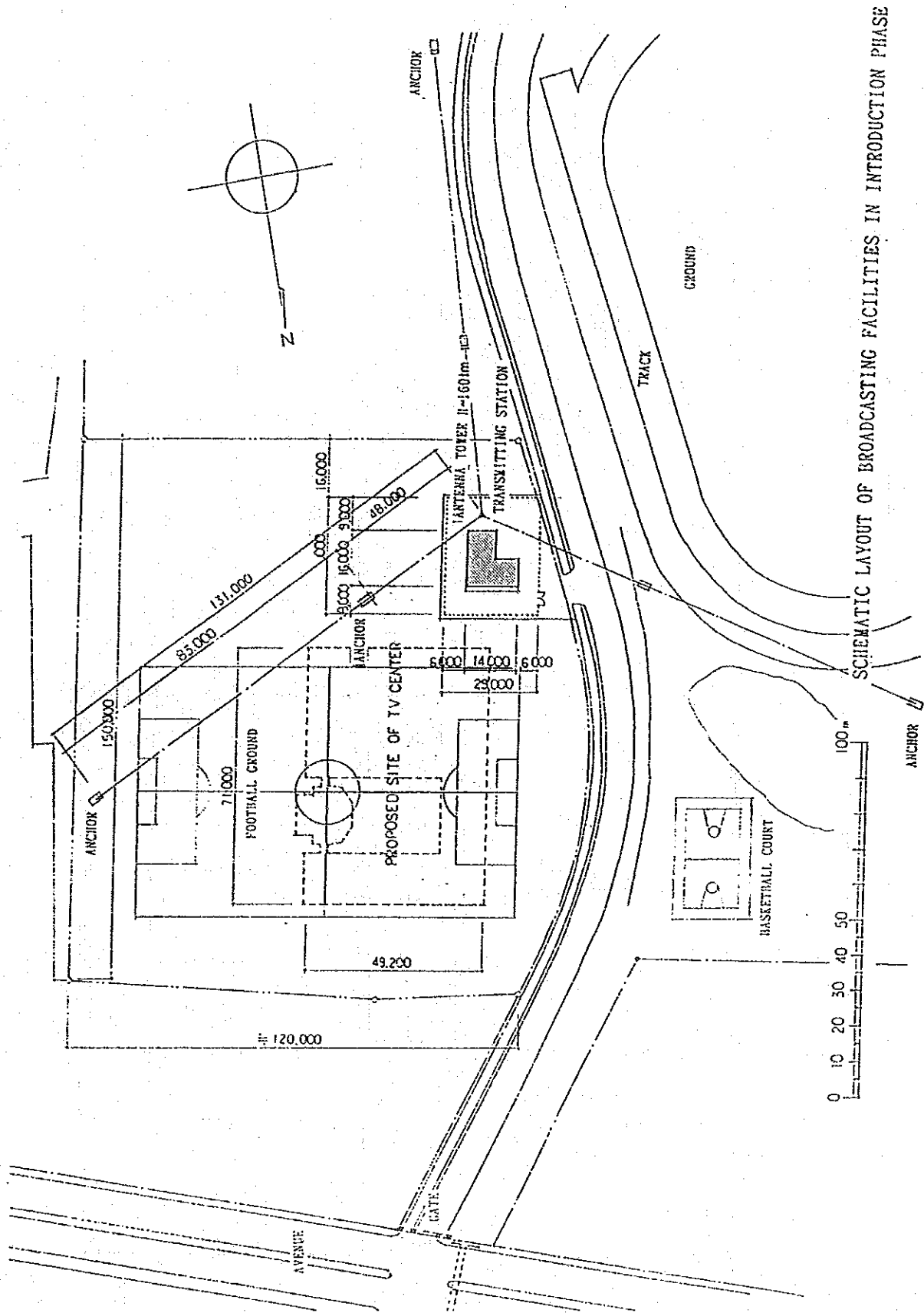
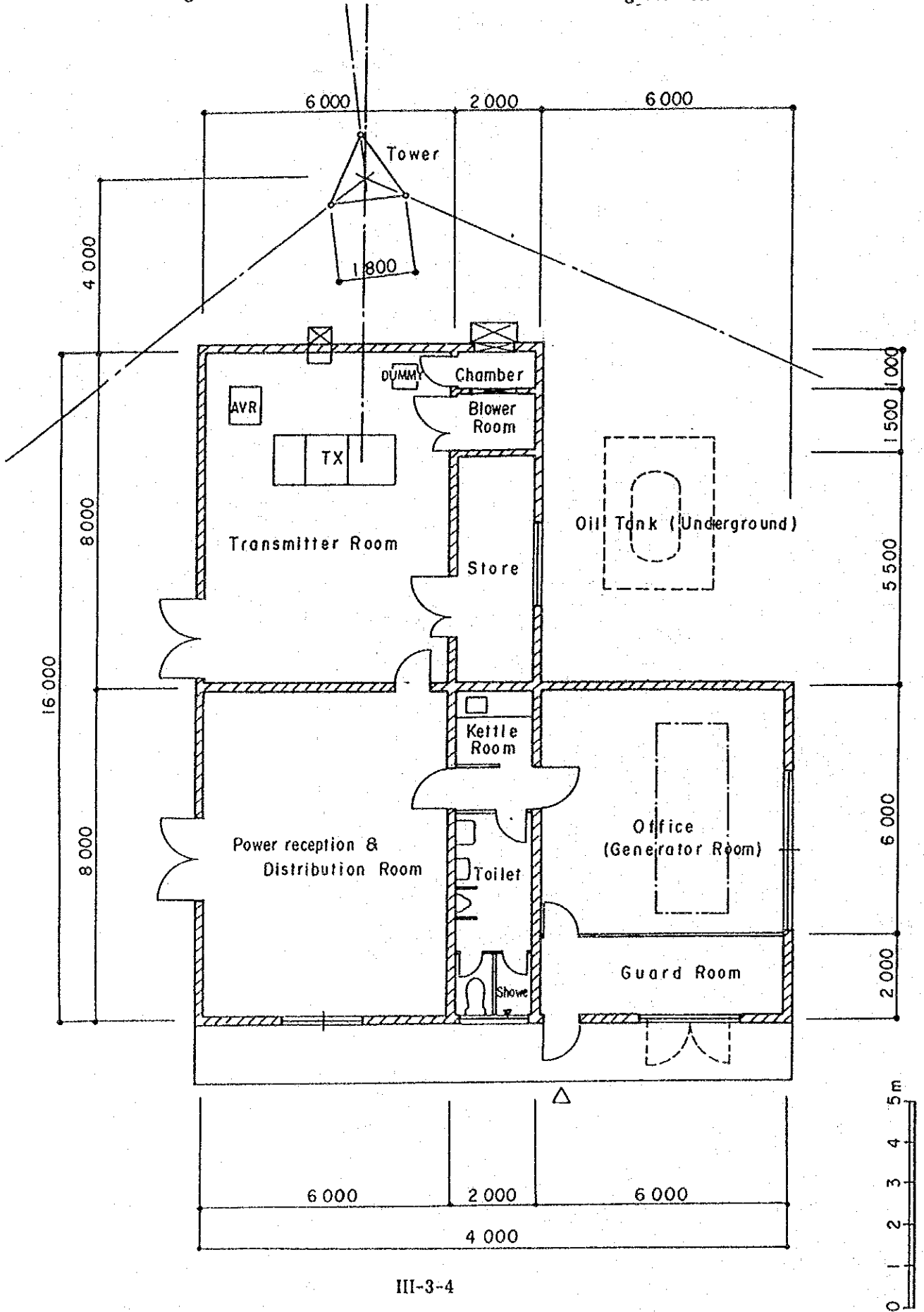


Figure 3.1.2 Floor Plan of Asuncion Transmitting Station



Next, as Asuncion is near the neighboring country of Argentina, radiated power to Argentina should be reduced by 10 dB in comparison with the maximum radiated power. Highly reliable solid-state unit type transmitter will be employed. If one unit fails, the unit can be replaced, thus simplicity of maintenance can be achieved. A color system converter unit to change from PAL-B to PAL-N will be installed at the transmitter input.

(e) Electric Power Facilities

A 24 kV line is extended from the entrance of the ISE premises. The length of new line is 200m. A 400 kVA high tension transformer will be installed for both of the transmitting station and the studio building in the initial stage. This construction work will be performed by ANDE (the public electric power company). An AVR (automatic voltage regulator) will be installed for the stabilization of incoming voltage.

(f) Emergency Generator

As the central station of an educational television broadcasting network, 200 kVA emergency generator will be installed in the transmitting station in case of power failure. The generator will be installed at the stage of construction of studio building. The load capacity will include the transmitting station and the studio building. The power output voltage will be 220V as standard voltage.

(g) Individual Air Conditioning Equipment

In order to lower the temperature in the transmitting station 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.



(2) Studio Facilities Plan

(a) MEC Studio and IPT 3F Studio (Introduction Phase)

a) Present Status of MEC Studio and IPT (3F) Studio.

Current studio equipment of MEC are fairly superannuated due to 10 years operation since its initial installation, and the number of equipment are also scarce.

The existing studio production system seems to be designed for the cut-by-cut shooting and the programs are edited by VTR post-production work.

The existing TV cameras are also old type of 3 plumbicon camera, and are used usually with poor registration. The supply of spare VTRs are U-matic low band type (3/4' tape) whose picture quality is not acceptable for broadcasting purposes.

Studio equipment at IPT (3F) were provided for the purpose of training of studio technical staff. The cameras are industrial type and not suitable for broadcasting. Besides, the height of the studio ceiling is low, and the studio itself is small, therefore, the programs here is limited to small scale production.

Under the above condition, it is urgently needed to reinforce and to improve the studio equipment system in order to produce educational programs efficiently.

b) Studio Production Equipment

In order to reinforce the production capability during the pre phase production at MEC studio and IPT 3F studio new TV cameras and VTRs are to be provided in advance.

**Table 3.1.1 TV Studio Equipment (MEC • IPT 3F)**

DESCRIPTION	Q'TY	Remarks
TV Camera (3CCD CCU Finder)	5 Sets	MEC 3 IPT 2
1/2 inch Component VTR	4 Sets	MEC 2 IPT 2
Timer for Remainder	2 Sets	MEC 1 IPT 1
Light etc.	1 Set	

**c) Editing Devices**

In combination with the provision of TV cameras and new type VTRs (1/2 component type), VTR editing sets, one each for MEC and IPT studio shall be equipped.

**Table 3.1.2 Editing Rooms (MEC and IPT)**

DESCRIPTION	Q'TY	Remarks
1/2 inch Component VTR	2 Sets	
Editing System	1 Set	
Monitor	1 Set	

**d) Master Control Equipment**

For sending out programs from the provisional ETV center at MEC of Don Bosco, a set of Master Control equipment shall be installed at a room next to the sub-control room of the studio.

TV Master control Equipment, video and audio systems drawings are shown in Table 3.1.3 and Figure 3.1.3, respectively.

**Table 3.1.3 Master Control System (MEC)**

DESCRIPTION	Q'TY	Remarks
Video Production Switcher	1 Set	
1/2 Inch Component VTR	3 Sets	
Sync Generator	1 Set	
TV System Convertor	1 Set	
Character Generator	1 Set	
Audio Mixer	1 Set	
Audio Limitter Amplifier	1 Set	
Audio Tape Recorders	1 Set	
Video Monitors	1 Set	
Audio Monitors	1 Set	

**e) Video Location Equipment**

Combined Camera-VTRs shall be arranged to efficiently record material for the production of science experiments, outdoor scenery, national events and other educational programs outside of the station.

**f) VCR Dubbing and Audition Equipment**

In order to examine experimentally produced educational programs in actual school classes especially in remote areas around Asuncion city, a dubbing equipment from produced packaged VTR tapes to a number of VCR (consumer type VHS) tapes shall be provided. And at the same time, a number of audition A/V equipment (VCR and TV monitor; 21 inch) shall be provided.

The provisions shall be supplied in the 2nd year (Experimental Phase).

(b) ETV Center (Full Scale Phase)

a) TV Studio and Sub-control Room

Table of TV Studio Facility Equipments list, video and Audio Systems Drawings are shown in Table 3.1.4 and Figure 3.1.4, 3.1.5, respectively.

Table 3.1.4 TV Studio System × 2

DESCRIPTION	Q'TY	Remarks
TV Camera	3 Sets	* 1 3CCD, CCU, Finder
Video Production Switcher	1 Set	
1/2 inch Component VTR	2 Sets	* 2
Character Generator	1 Set	
Frame Synchronizer	1 Set	
Sync Generator	1 Set	
Audio Mixer	1 Set	
Audio Tape Recorders	2 Sets	
Video Monitors	1 Set	
Audio Monitors	1 Set	
Microphones	1 Set	
Lighting Equipment	1 Set	
Cabinet for Magnetic Tapes & Microphones etc.	1 Set	

\*1 5 Sets of camera and \*2 4 Sets should be provided in the 2nd Year for reinforcement of existing studios.

b) Sound Studio

Table of Sound Studio Facility Equipments and audio system drawing are shown in Table 3.1.5 and Figure 3.1.6, respectively.

Table 3.1.5 Sound Studio System

DESCRIPTION	Q'TY	Remarks
Audio Mixer	1 Set	
Audio Tape Recorder	2 Sets	
Video Monitor	1 Set	
Audio Monitor	1 Set	
Microphone	1 Set	
Microphone Stand	1 Set	
Cabinet for Magnetic Tapes & Microphones etc.	1 Set	

c) Post Production Room

The equipment list, video and audio systems drawings are shown in Table 3.1.6 and Figure 3.1.7, respectively.

Table 3.1.6 Post Production System × 2

DESCRIPTION	Q'TY	Remarks
Video Production Switcher	1 Set	
1/2 inch Component VTR	3 Sets	
Character Generator	1 Set	
Audio Mixer	1 Set	
Video Effector	1 Set	
Audio Tape Recorders	2 Sets	
VTR Editing System	1 Set	
Computer Graphics	1 Set	
Video Monitors	1 Set	
Audio Monitors	1 Set	
Cabinet for Magnetic Tapes & Microphones etc.	1 Set	

d) Editing Room

Editing room facility equipment, video and audio system drawings are shown in Table 3.1.7 and Figure 3.1.8, respectively.

Table 3.1.7 Editing Equipment × 4\*

DESCRIPTION	Q'TY	Remarks
1/2 inch Component VTR	2 Sets	*
Editing System	1 Set	*
Monitors	1 Set	*

\* Be provided in the 2nd Year

e) TV Master Control Room

TV Master control room facility equipment table, video and audio systems drawings are shown in Table 3.1.8, Figure 3.1.9 and 3.1.10, respectively.

Table 3.1.8 Master Control System

DESCRIPTION	Q'TY	Remarks
TV Camera	2 Sets	3CCD
Video Production Switcher	2 Sets	
1/2 inch Component VTR	6 Sets	*
Frame Synchronizer	1 Set	*
Sync Generator	1 Set	*
TV System Convertor	1 Set	*
Character Generators	2 Sets	*
Audio Mixer	2 Sets	
Audio Limitter Amplifier	1 Set	*
Audio Tape Recorders	3 Sets	*
Video Monitors	2 Sets	*
Audio Monitors	2 Sets	*
Microphones	1 Set	*
Clock System	1 Set	
Audio Cassette Tape Recorder	1 Set	*
Rf Distribution System	1 Set	
Coffers for Magnetic Tapes & microphones etc.	1 Set	

\* Pre-installed in 2nd Year (Experimental /Phase)

f) Outside Broadcasting Van (OB Van)

The Outside Broadcasting van equipment, video and audio systems drawings are shown in Table 3.1.9, Figure 3.1.11 and 3.1.12, respectively.

Table 3.1.9 OB Van System

DESCRIPTION	Q'TY	Remarks
TV Cameras	2 Sets	3CCD CCU Finder
Video Production Switcher	1 Set	
1/2 inch Component VTR	2 Sets	
Character Generator	1 Set	
Audio Mixer	1 Set	
Sync Generator	1 Set	
Field Pick up Units	2 Sets	*
Audio Tape Recorder	1 Set	
Video Monitors	1 Set	
Audio Monitors	1 Set	
Microphones	1 Set	
Microphones Stand	1 Set	
Lighting System	1 Set	
Engine Generator	1 Set	

\* To be provided in the 2nd Year

g) Video location equipment \*

Combined Camera-VTRs shall be arranged to efficiently record material for the production of science experiments, outdoor scenery, national events and other educational programs outside the station.

\* To be provided in the 2nd Year with 2 audio mixers and video switcher.



Figure 3.1.3 Block Diagram of Master Control Room for Introduction Phase.

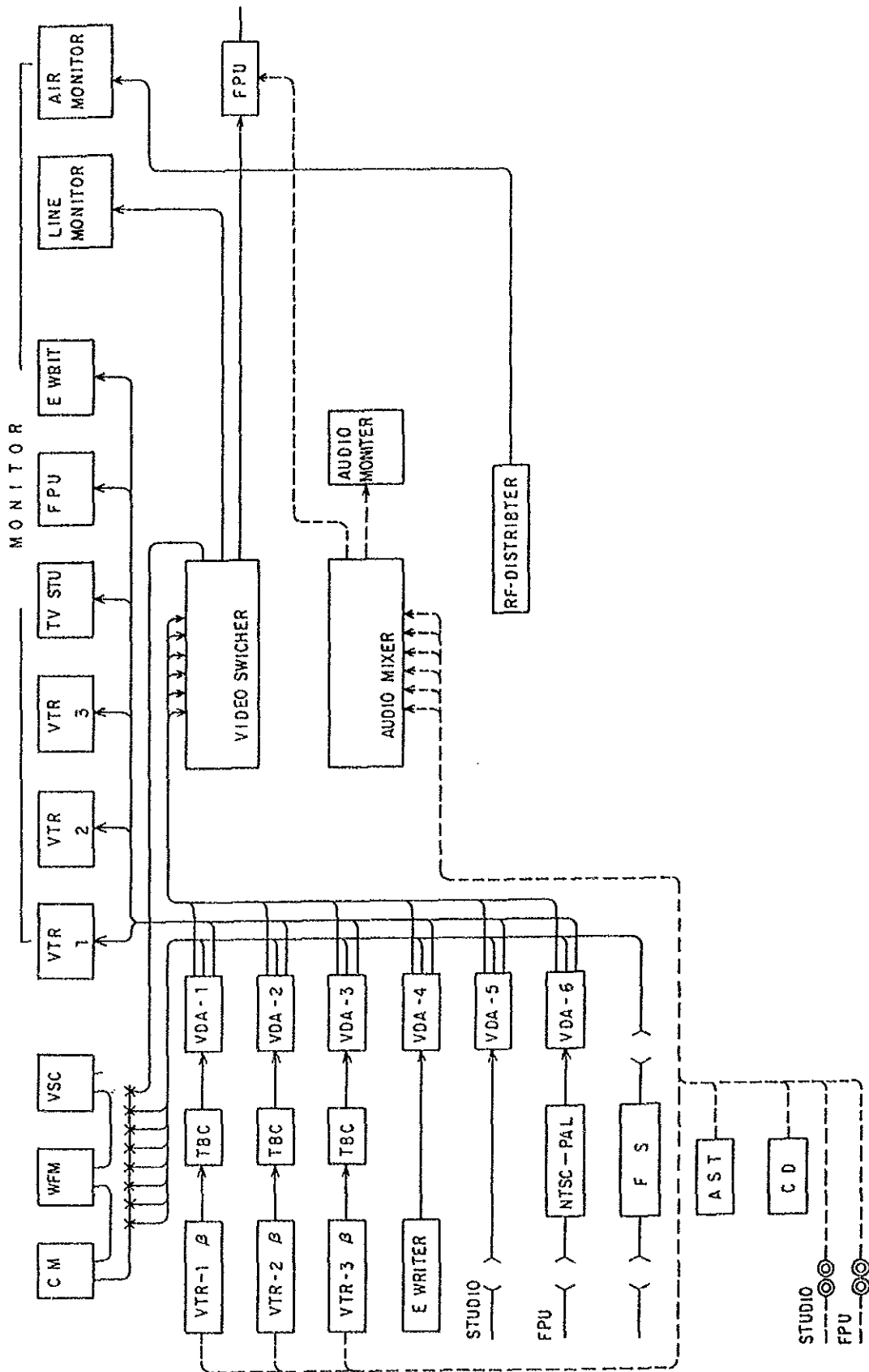


Figure 3.1.4 TV Studio Sub Control Room Video Block Diagram.

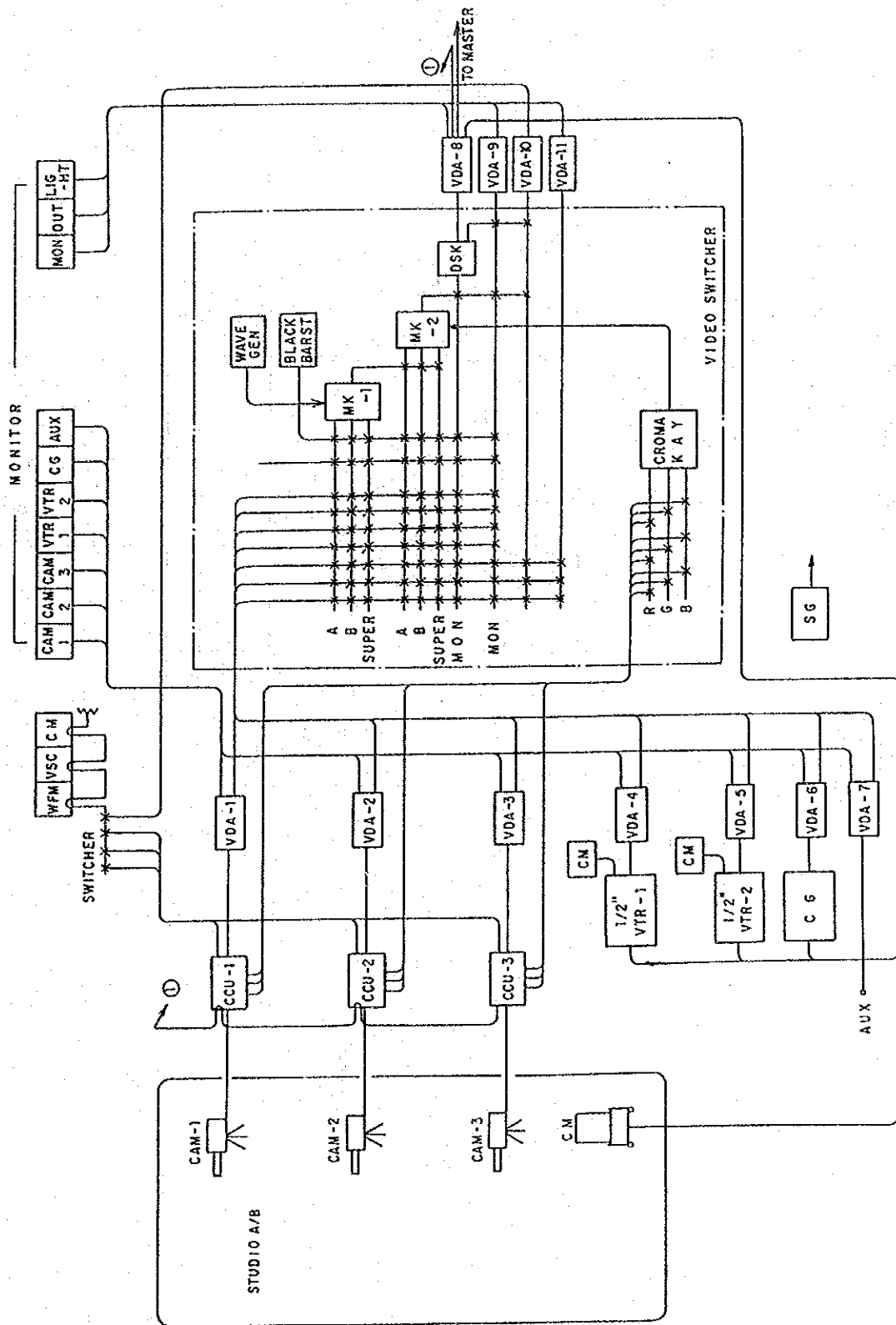


Figure 3.1.5 TV Studio Sub Control Room Audio Block Diagram.

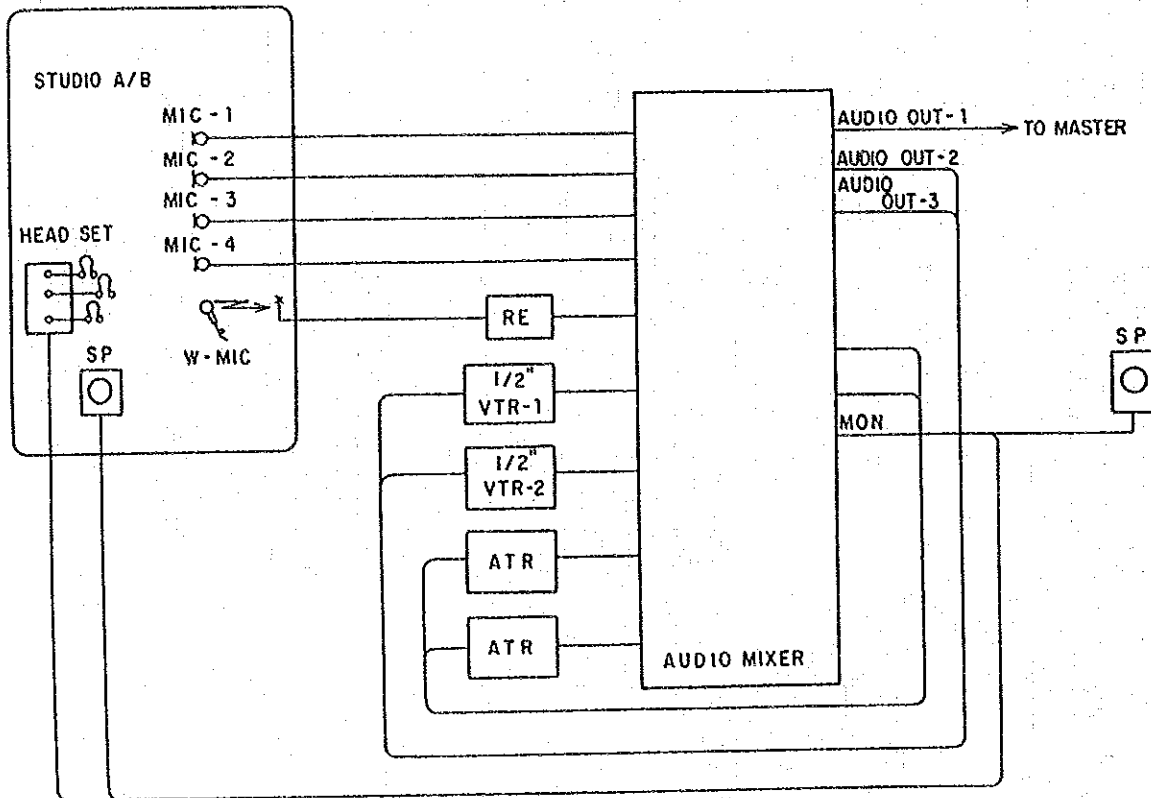


Figure 3.1.6 Sound Studio Sub Control Room Audio Block Diagram.

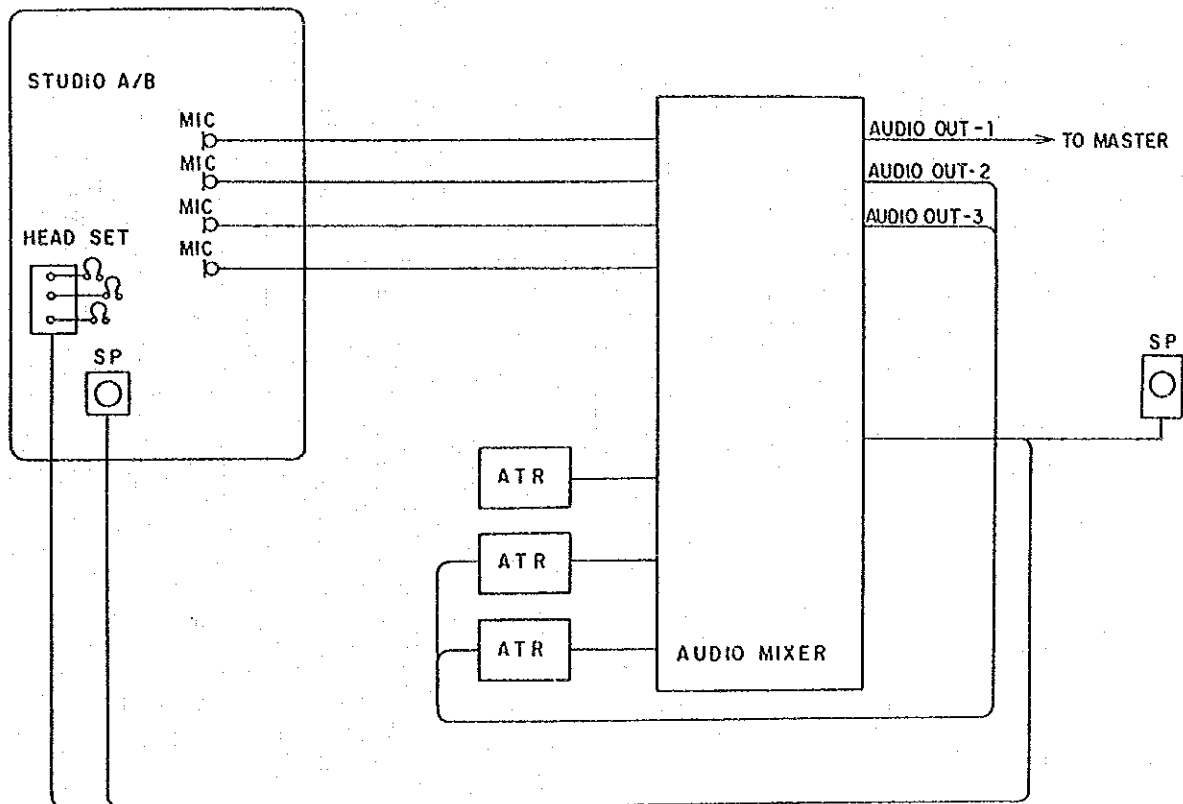


Figure 3.1.7 Post Production Room System Block Diagram.

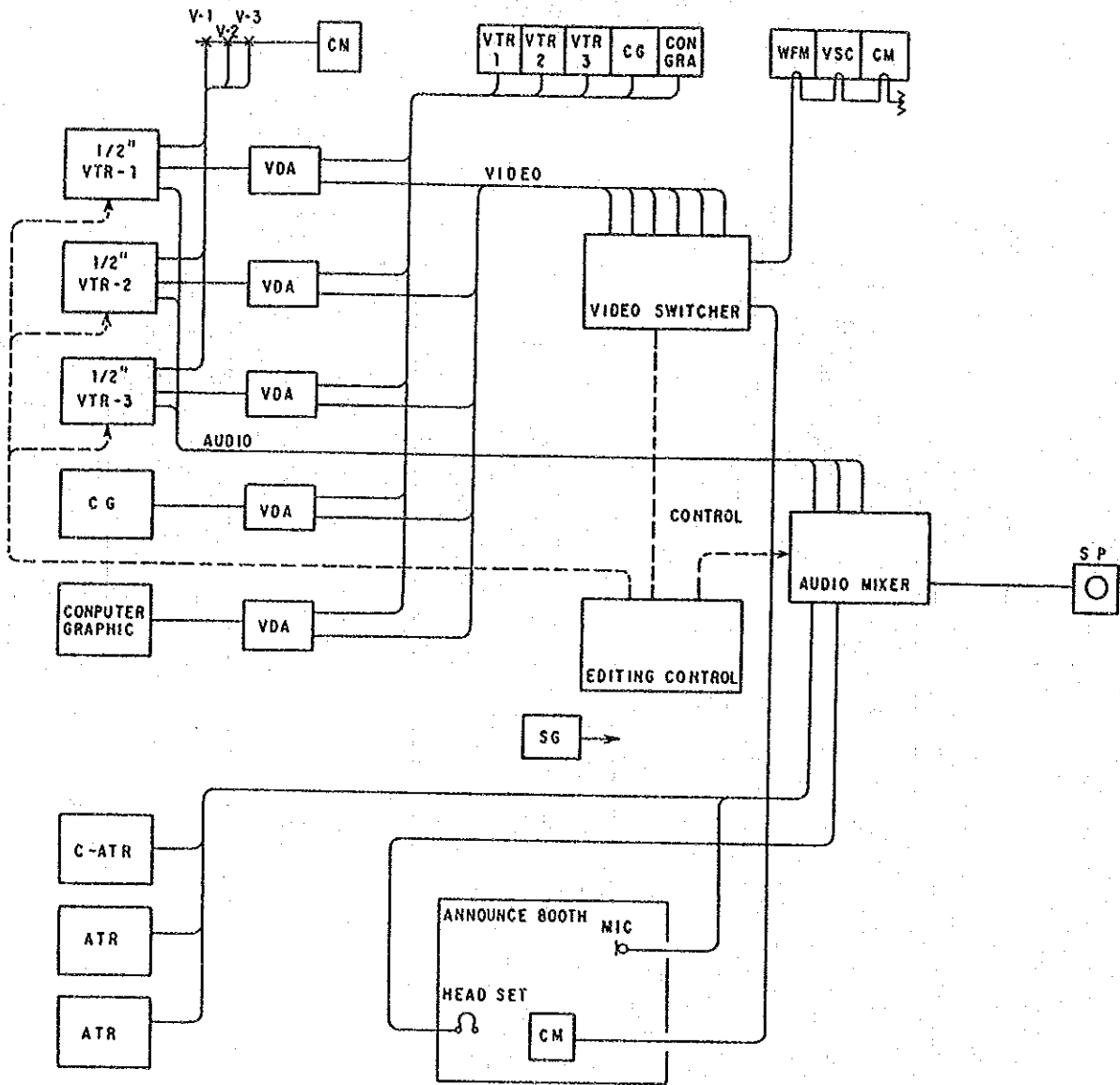


Figure 3.1.8 Editing Room System Block Diagram.

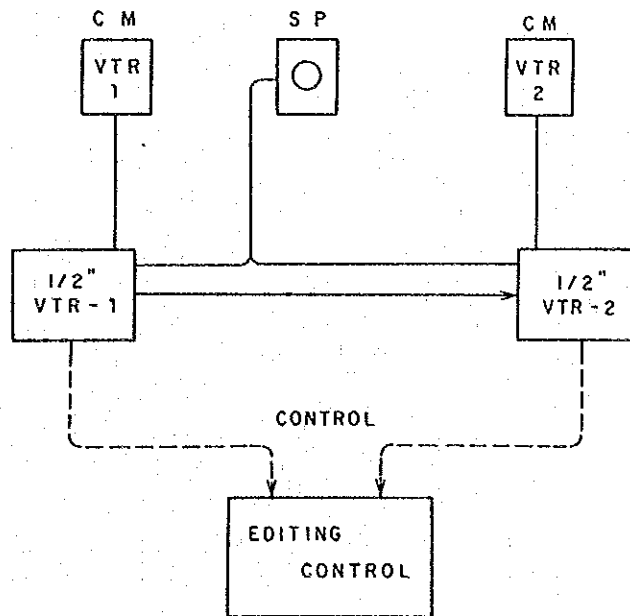


Figure 3.1.9 Master Control Room Video Block Diagram.

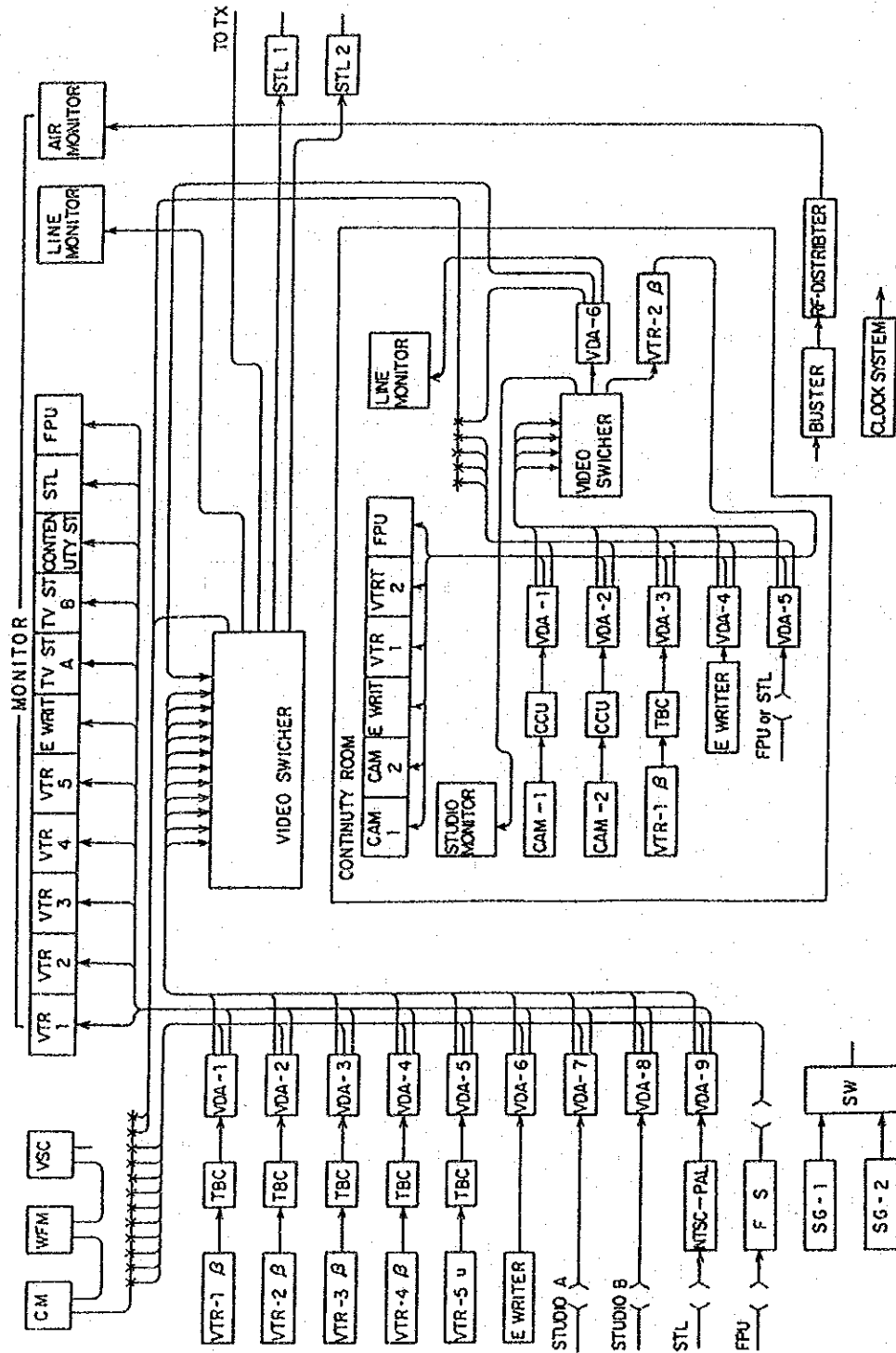


Figure 3.1.10 Master Control Room Audio Block Diagram.

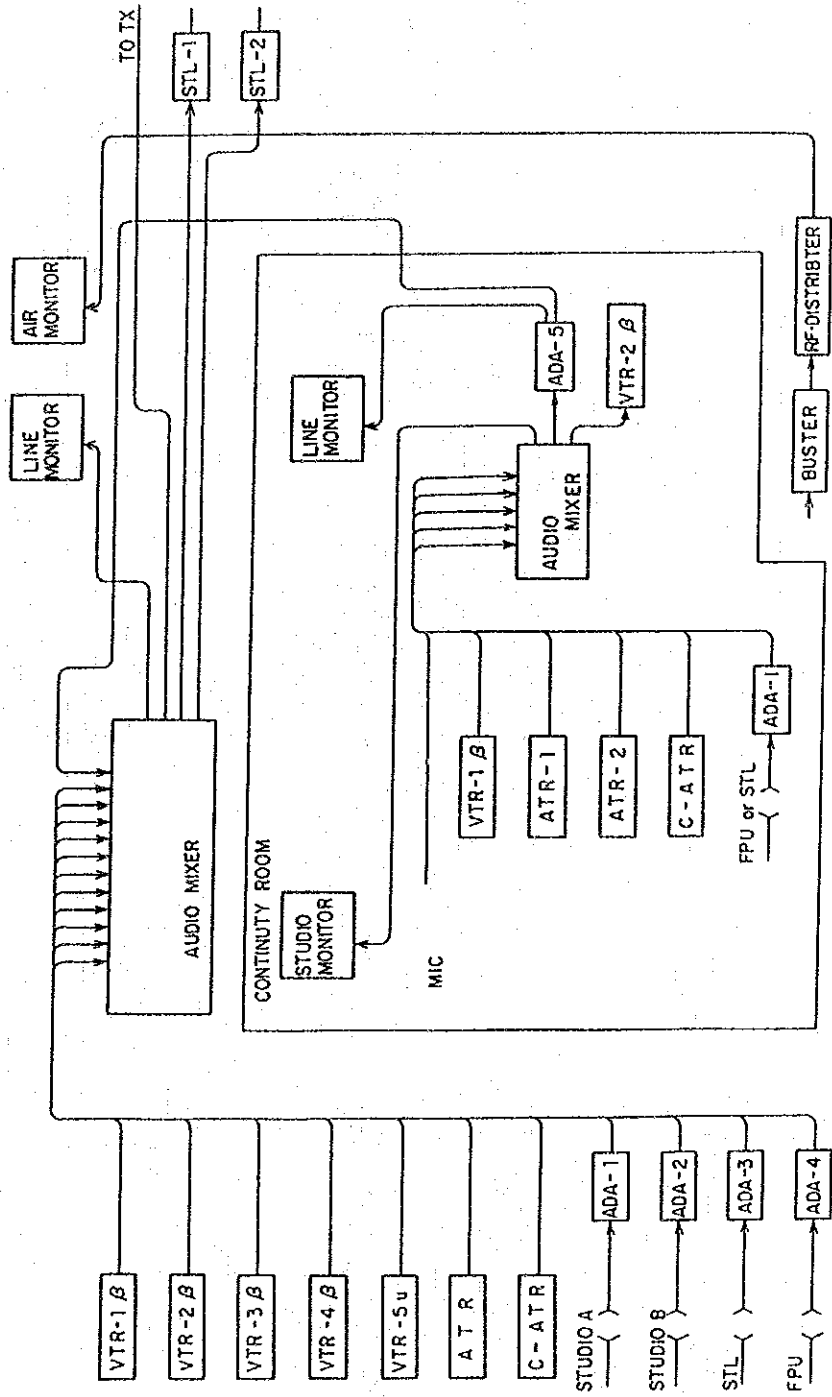




Figure 3.1.11 TV OB Ban Video Block Diagram.

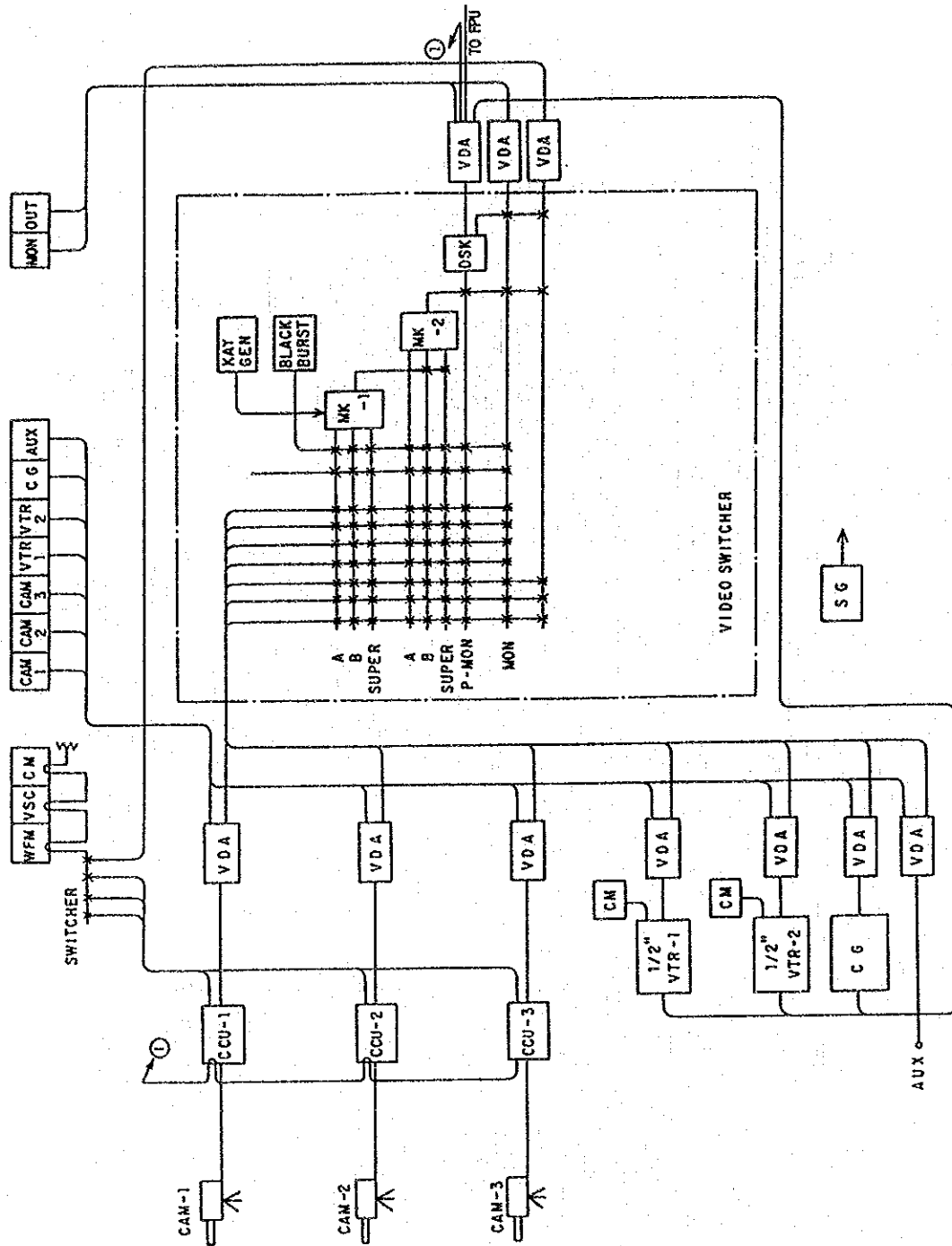
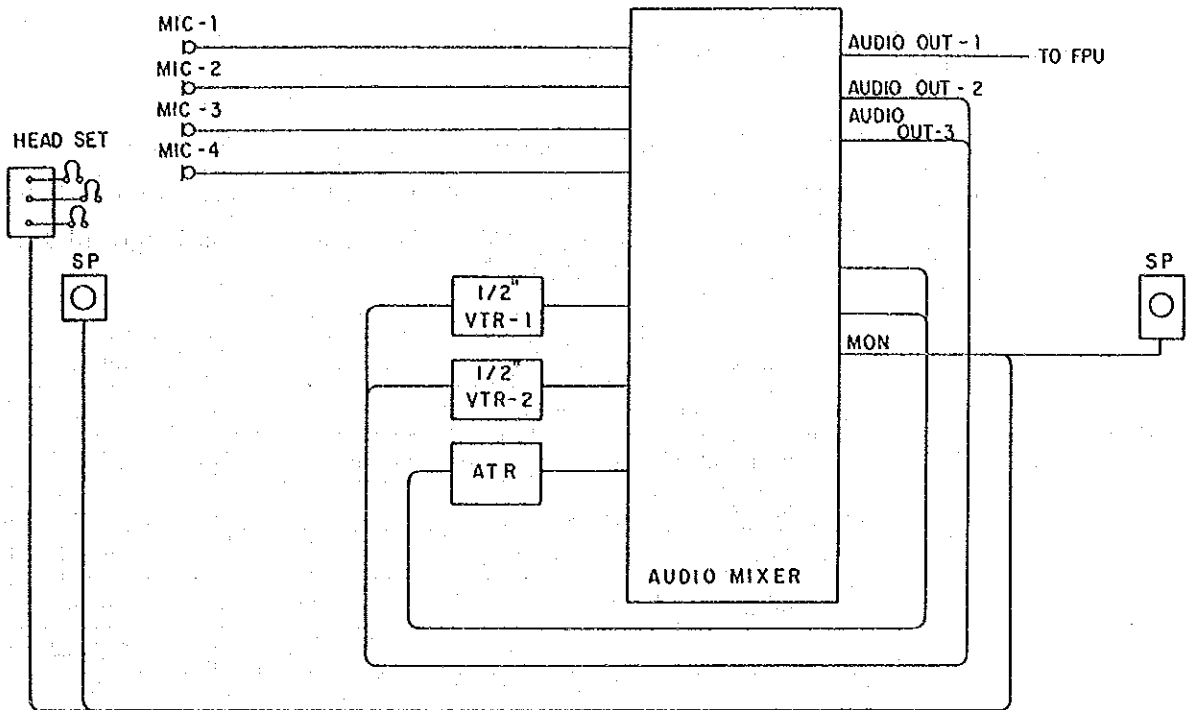


Figure 3.1.12 TV OB Ban Audio Block Diagram.



### 3.2 Ciudad del Este Station

#### (a) Transmitting Station Site

The site will be jointly used with the ANTELCO premises in the city of Ciudad del Este. The altitude of the site is 220m. The layout plan and floor plans are shown in Figure 3.2.1~2.

#### (b) Station Building

A new structure will be built on the ANTELCO premises for the transmitting station. The station building having 16m x 8m will be constructed below the antenna tower so as to shorten the length of feeder line.

Transmitter room	64 m <sup>2</sup>
Maintenance room	19.5 m <sup>2</sup>
Office room (future use as Generator room)	40 m <sup>2</sup>
Storage room	11 m <sup>2</sup>
Restroom hot water heaters	6 m <sup>2</sup>
Blower room	5.0 m <sup>2</sup>
Total	128 m <sup>2</sup>

#### (c) Antenna Tower

The existing tower (a self-supporting tower with legs 8.2m apart, 92m high) will be used. ANTELCO, however, has Projects IV and V scheduled within the fiscal year 1993, which plan to construct three parabolic antennas: 3.6m in diameter (90m above ground), 1.8m in diameter (68m high), 1.8m in diameter (47.5m high). UHF transmitting antenna (3 stages 4D antenna for 3 faces and one stage 4D antenna for one (1) face) will be installed on the existing tower with low wind pressure load.

**(d) TV Transmitter and Transmitting Antennas**

A UHF 10 kW (CH-18+) output was selected for the transmitter, and 3 stage 4D antenna for the transmission antenna with a maximum ERP of 90 kW. The feeder used is 77D type. The existing commercial TV station is using Channel 21, Channel 18+ should be adopted in consideration of the concept of family channel.

Since Ciudad del Este is on the borders with Argentine and Brazil, in order not to cause any TV interference, a maximum radiated power to both countries should be reduced by 5 dB. Furthermore, a color system converter will be installed at the transmitter input.

**(e) Electric Power Facilities**

A 100 kVA high tension transformer for TV station should be installed at the left side of the existing high tension transformer on the ANTELCO premises. In this station, it is not necessary to install AVR because of good power condition.

**(f) Emergency Generator**

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

**(g) Individual Air Conditioning Equipment**

In order to lower the temperature to below 25 degrees inside, a single unit packaged style 26,000 kcal air conditioner should be installed.

Figure 3.2.1 Layout Plan of Broadcasting Station in Ciudad del Este.

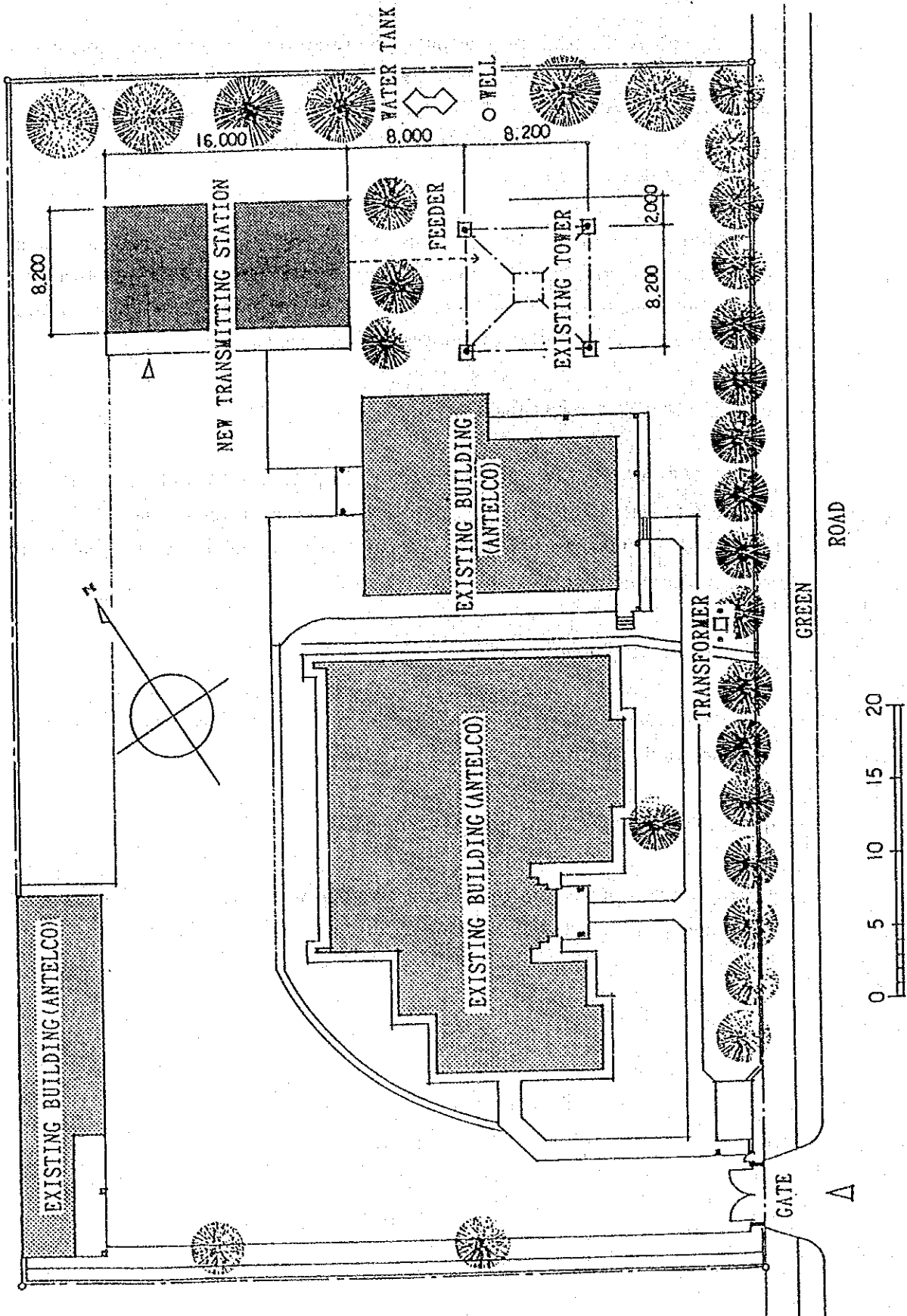
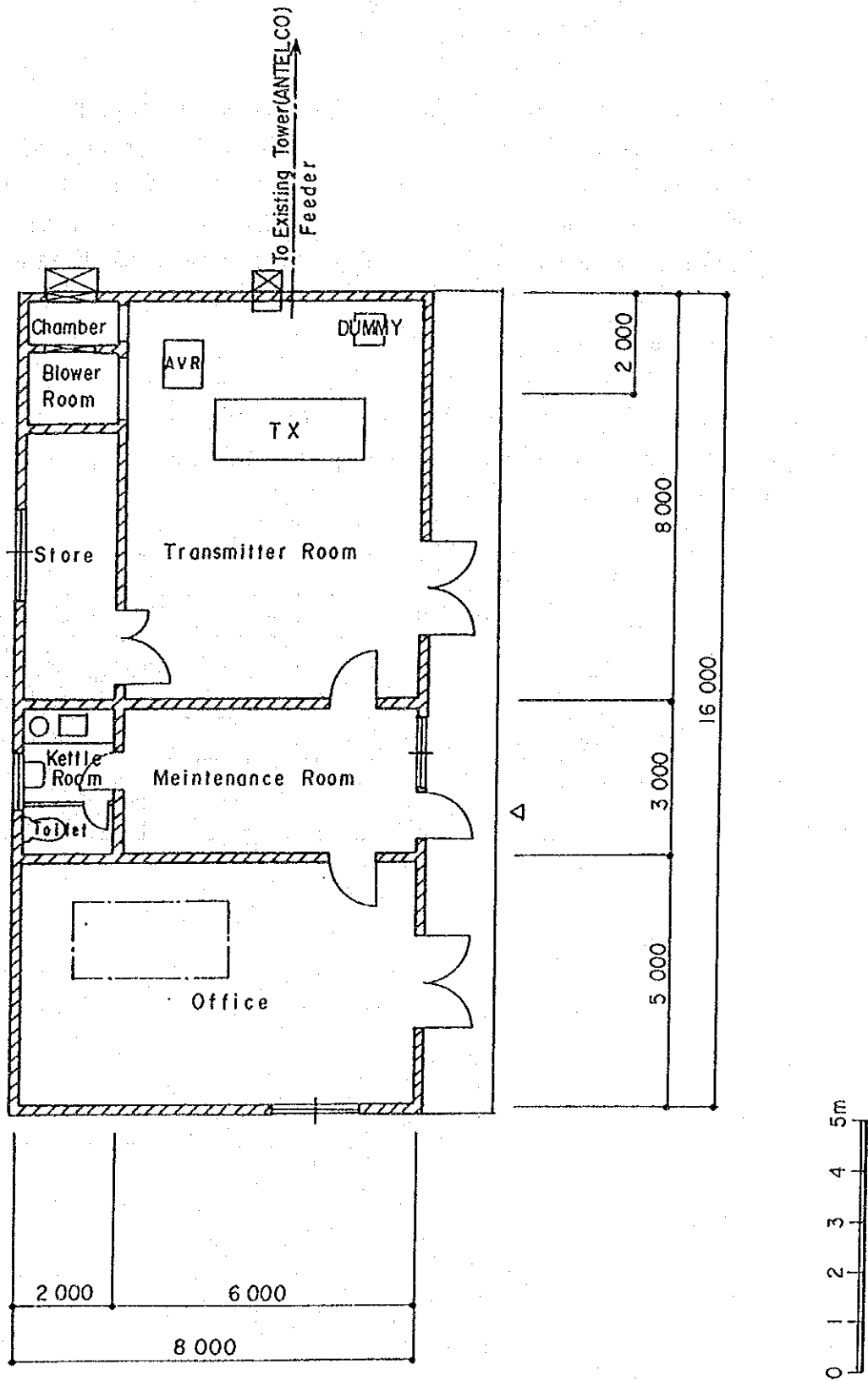


Figure 3.2.2 Floor Plan of Ciudad del Este Transmitting Station



### 3.3 Encarnacion Station

#### (a) Transmitting Station Site

As the location of the ANTELCO Encarnacion station (altitude 110m) is near a river, and its altitude is low. It would not be possible to serve a wide area. Therefore, it was decided to jointly use the ANTELCO relay station (altitude 276m) in the city of Cap. Miranda, a high altitude inland site, as the transmitting station. The size of the site is 155m × 135m.

#### (b) Station Building

The station building will be constructed under the new antenna tower. The floor space of the station building shall be 16m × 8m. Layout and floor plan are as shown in Figure 3.3.1~2.

Transmitter room	48 m <sup>2</sup>
Office room (future use as generator room)	40 m <sup>2</sup>
Maintenance room	18 m <sup>2</sup>
Storage room	11 m <sup>2</sup>
Restrooms, hot water heaters	6 m <sup>2</sup>
Blower room	5 m <sup>2</sup>
Total	128 m <sup>2</sup>

Figure 3.3.1 Layout Plan of Broadcasting Station in Encarnacion.

