CHAPTER 3 PROGRAM PLANNING

3.1 Basic Policy for Program Planning

(1) Educational-broadcast Utilization Plan and Programs

Table 3.1.1 shows the relationship between the TV programs and educational broadcasting utilization plan discussed in Chapter 1 of Part II. Program planning was worked out based on the educational broadcasting utilization plan.

Table 3.1.1 Educational broadcasting Utilization Plan and TV Programs

Project \ Phase		Full-scale Phase 1	Full-scale Phase 2	Integrated Phase 3	User Units	Broadcasts intended for:
		Short-range objective	Midium-range objective	Long-range objective		
Primary Education	Objectives	Improvement of study content (aiming at reducing the number of dropouts)		Enhancement of pupils ability	School	School children & Pupils
	Aims of Program	Complementing teacher short-age/correcting excessive variation in guidance methods		Presentation of education content that cannot be offered with text books alone		
	Program Category	1. Primary school programs				
Secondary Education	Objectives		Improvement of study content (aiming at reducing the number of dropouts)	Enhancement of academic ability	School	Pupils
	Aims of Program		Complementing teacher short-age/correcting excessive variation in guidance methods	Enhancement of diversification education content that takes into account latter-half secondary specialized course		
	Program Category		2. Secondary schools' hour			
Training of Teachers, and the Students Aspiring to a Teaching Career	Objectives	Training and retraining of high-quality teachers			School	Serving-teachers & Students
	Aims of Program	Strengthening of guidance/Training in guidance method of education using broadcasts				
	Program Category	3. Programs for Teachers				
Correspondence Secondary Course	Objectives			(1) Complementing school education (2) Securing access to schools	Individuals	Pupils
	Aims of Program			Strengthening of basic subjects		
	Program Category			4. Correspondence secondary course		
Training of Teachers by correspondence	Objectives	Training and retraining of high-quality teachers			Individuals & Groups	Serving-teachers & Students
	Aims of Program	Complementing the guidance given in school education				
	Program Category	5. Programs for Teachers				
Socially-weak Persons	Objectives	Fulfillment of basic education and correction of imbalance in education opportunity			Small groups & Communities	Socially-weak persons (infants, unenrolled children, non-literate persons disabled persons, etc.)
	Aims of Program	Literacy education/ Infants' education	Improvement of individual and family lives	Fulfillment of social education		
	Program Category	6. Literacy Education/Infants' Hour				
People with Specific Needs	Objectives			Fulfillment of individual study needs	Individuals	Groups having specific learning needs
	Aims of Program			Strengthening and improvement of skills and knowledge		
	Program Category			7. Courses on skills		
General Education	Objectives	Fulfillment of education and cultural enhancement of people in general			Individuals & Families	General public
	Aims of Program	Maintenance of women's education, environmental issues, citizens' life, and social interests.				
	Program Category	8. Public notices, "wide" programs, music, dramas, Housewives' Hour, etc.				

(2) Program Contents.

1) Programs for Primary School

Among the subjects for primary school pupils from the 1st to 6th grades, those subjects considered essential at present which are communication, mathematics, natural science, will be taken up on a priority basis so as to enhance the levels of the primary schools in Paraguay.

Since the children of Paraguay normally use Guarani with their parents in their daily lives until they enter primary school, they often come to hate going to school as they cannot understand classes given by the teachers in Spanish and this has become one of the main reasons of "school-leavers". In the lower-grades, communication as the subject to complement the studies in Guarani and Spanish, and, in the higher grades, mathematics and natural science which become increasingly difficult, will be taken up as priority subjects in producing the programs.

2) Programs for Secondary Schools

In producing the programs for secondary schools, priority will be given to natural science, health, hygiene, art, social studies and practical work training. Since the primary-school programs are given priority in the Full-scale Phase 1, the programs for secondary schools will be scheduled for broadcast as from the Full-scale Phase 2 in the 9th year when the production and the program utilization conditions will have become well established.

3) Programs for Teachers (Training of Teachers)

In Paraguay, teachers are in short supply and training of teachers is now a matter of great urgency. Training of teachers is conducted at IFD, CRE as well as at ISE. The programs are for the training of teachers and will deal with teacher-training subjects including pedagogy.

4) Correspondence Secondary Course

With those studying at home as target audience, the correspondence secondary course will take up and systematically broadcast such basic subjects for secondary school as Spanish, mathematics and natural science. Since it takes time to establish a system and make preparations, this program will be started from the Full-scale Phase 3 in the 12th year.

5) Programs for Teachers (Teachers in Active Service)

The rate of teachers without qualifications exceeds 20% and enhancement of teachers' ability is urgently required.
Programs to help the unqualified teachers acquire qualifications will be scheduled for broadcast. With the aim of enhancing the quality of the teachers in active service, the programs will deal with such matters as explaining the important points in giving guidances on different subjects, the methods of classroom-teaching and ways to develop children's abilities. In order to make effective use of school broadcast programs, it is necessary to learn also about education using broadcasts. In the programs, concrete methods of using broadcasts in school education will be studied, such as, how should program-viewing and classroom-teaching be linked together. For example, some practical things could be taken up, such as, catching murmurs of a pupil heard while watching a TV program in the classroom and developing them into conversations between the teacher and pupils.

6) Programs for the Socially-weak Persons

As the programs for the socially-weak persons, literacy education and preschooler education will be emphasized. For the education of illiterates people, literacy education programs will be broadcasts. Furthermore, on Saturday and Sunday mornings, the programs will be repeat-broadcast for the benefit of those studying at home. At present, in Paraguay, the CRES and other educational institutions are making efforts to promote literacy education by inviting illiterate people to gather in the evenings to join in a study class. However, there is a problem of being unable to achieve significant results to justify the money spent. Consequently, expectations are placed on the effects of this literacy program to improve the

situation. The contents of the programs in this category include guidance in the study of Spanish, civic, technical-skills and other educational courses which are required in people's daily life.

The education of preschoolers will be promoted for the benefit of the children immediately before reaching their school age by helping them develop their language skills from Guarani to easy Spanish.

7) Programs for Audience with Specific Needs

These are the programs designed to help the people in acquiring various technical skills which the modern age demands, such as, computer, architecture and automobile.

8) Educational Programs for the General Public

With the public-notice and live "wide" programs serving as the core, the programs in this category include government's public-relations programs and those dealing with daily news and educational information. For example, there are "campaign programs against AIDS and narcotics", "programs to prevent alcoholism" and "child-rearing programs" from the Ministry of Health & Social Welfare, "parasite-prevention programs" from the Ministry of Agriculture and Livestock and "crime-prevention programs" from the Police Agency.

Other programs such as women's education, civil education, environmental issues and civic life will also be produced in order to enhance people's educational and cultural levels.

9) Programs Procured from Outside

a) Procurement of High-quality Programs

In conducting program production for educational broadcasting, emphasis will be placed on independent production. However, the method of procuring high-quality programs from outside either by purchase or by having others offer their programs for the educational broadcasting can also be considered. Acquiring high-quality programs that suit the educational program compilation not only from within

Paraguay but also from other countries including the industrialized nations and broadcasting of such programs in the country will definitely lead to the enhancement of the quality of educational broadcasting of Paraguay.

At present, the Teleducation Department of MEC has in stock some 50 educational programs, including science and mathematics programs, which have been supplied from Japan under Grant Aid. These programs can be expected to be used effectively in the future within the framework of the school-education programming to be produced from now on. Also for use in the broadcasts of general programs, it is quite possible to consider purchasing high-quality programs produced outside, such as, dramas, music and sports programs.

b) Educational Programs of Iberoamerica

As to the educational programs of Iberoamerica, it has been made known that they have a plan of broadcasting the programs for three hours a day. Since the reception of these programs are scheduled to become feasible by around the middle of 1993, examination will be made on the contents of the programs, when the reception becomes possible, to find ways to make effective use of them. (See 3.2.2 of this report.)

3.2 Basic Concept of Program Compilation

(1) Program Compilation

1) Program Compilation

Program compilation means to establish broadcasting plans on yearly, monthly, weekly and daily bases according to the guidelines set by Public Television Broadcasting Council and Educational Television Broadcasting Council, taking into account such factors as the changes in the audience's needs, people's daily lives and the society as a whole. In this case, what is of primary importance is to conduct program compilation while giving

thoughts to (i) for whom are the programs intended, (ii) what are going to be broadcast and (iii) for what purpose?

2) Three Indispensable Factors of Program Compilation

In order to produce, broadcast and develop good educational programs on a continual basis, the following three factors are essential:

a) Man (well-trained personnel, good performers and people supporting the first two)

b) Machine (broadcasting facilities including, of course, the routine maintenance and management for the upkeep of the functions of such facilities)

c) Money (sound finance)

In Paraguay, as far as educational broadcasting is concerned, it is a start from "the very beginning stage". Therefore, it is necessary to thoroughly consider the link between Man, Machine and Money and thereby to establish a program compilation plan for each developmental stage, that can be realized steadily.

(2) Characteristics of Program-production Work

The following points may be raised as the characteristics of program-production work:

1) Cooperation and close teamwork among different production staff from a great variety of job categories is indispensable condition for the production.

2) Creativity is required each time when a program is produced and repetition of same idea is not allowed.

3) Research & development and production work are undertaken simultaneously.

4) In carrying out the work, one must be prepared for any possible uncertainties.

5) Number of production is small but high program quality shall be considered essential.

6) In order to carry out an individualistic type of work, people with adequate abilities are required.

More specifically, the following points should be emphasized.

For the production of each program, a production staff from a large number of job categories (that is, the specialist groups) with different types of skills are required and with a lack of even one such specialist, the program production work would not proceed as scheduled.

Second, the program itself differs in content from others each time it is produced. Creativity is required each time a program is produced and each program content cannot be repeated.

Third, unlike general production activities, it is the kind of work in which R&D-type work and the production work of creating a program proceed simultaneously.

Forth, in carrying out the work, one must be prepared for many uncertain factors, such as, the arising of unexpected situations, an accident involving a performer and changes in weather (in the case of outdoor VTR locations). And all these factors immediately affect the entire work.

Fifth, each educational program is produced as something that always contains new knowledge or information. This means that a great variety of products, each with an extremely small quantity of output each time, are be in produced. And a high quality is demanded of each product.

Sixth, in order to carry out this work of program production which is quite individualistic, personnel possessing abilities high enough to cope with the demanding work are necessary.

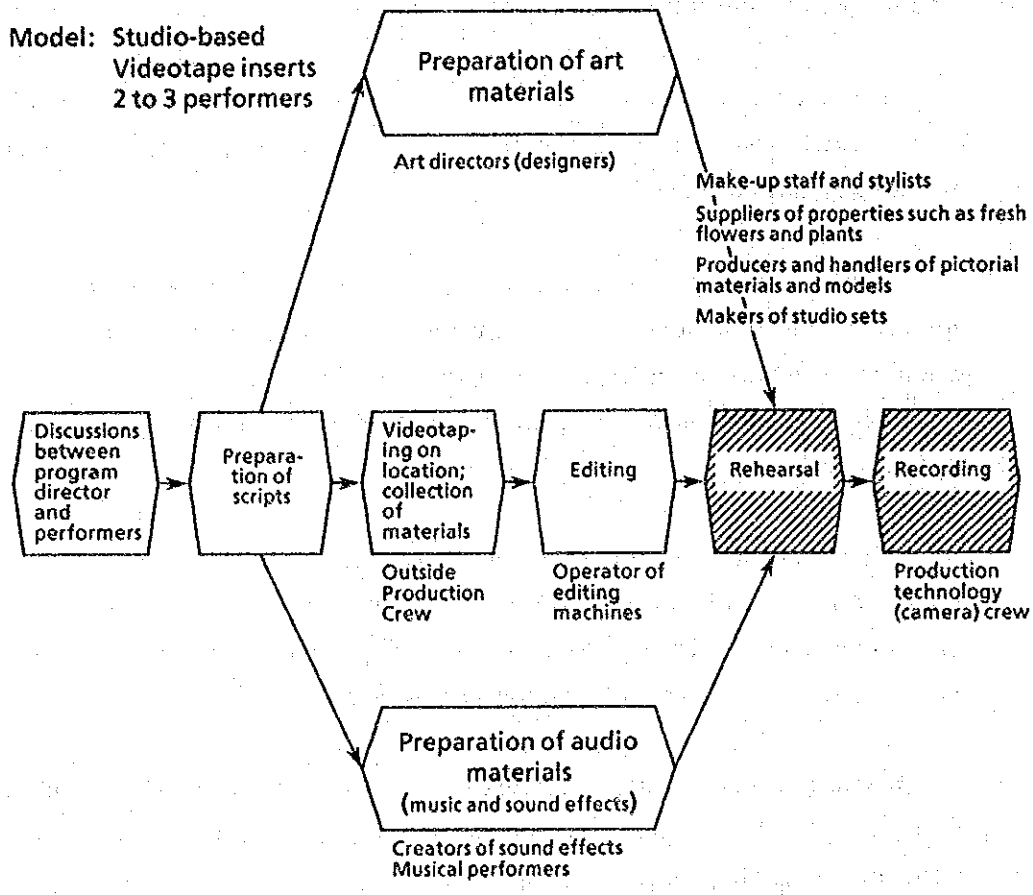
(3) Duties of Program-production Producers (PDs)

1) Duties of PDs

The duties of a PD is extremely diversified, covering a wide range of activities from planning to program production, and is carried out in cooperation with other staff from a great variety of job categories. Therefore, the program production work would not proceed smoothly unless the PD in charge goes into production work in the studio with a firm grasp of the entire picture of the projected work.

The chart given below shows the program-production procedures to be followed by the PD. The hatched portions are the studio work to be handled by the PD but, before taking up such work, there are a variety of preparations that need to be made, including the writing of a script for the program being produced.

Figure 3.2.1 Program-production Procedures



2) Scripts for Educational Programs

Especially in the case of school broadcast programs, a large number of programs need to be produced and, moreover, these programs are normally produced and broadcast in series. As a result, unless the PD has a firm grasp of the entire picture of the production work, it is difficult for him (her) to draw up a production schedule. As for the individual programs, too, it is necessary for the PD to write the script himself in consultation with the teacher appearing in the program and to conduct the production work while keeping the flow of the program content in mind.

If he write the script himself, the PD would be able to cope immediately with any sudden change occurring in the process of work or with an accident which affect to the production work. In the case of a PD in charge of educational programs, writing scripts himself means to improve the programs.

3) Budget Control of Program-production Expenses

When the production of a program begins, various kinds of expenditure occur in the course of the PD's work.
Since programs are produced under a prescribed budget, it is necessary for the PDs to control the budget for daily expenses and thereby to ensure efficiency in the production work.

(4) Importance of Program Accumulation

1) Storage of Program and Program-material Tapes

When the program production begins and the completed programs come to be broadcast, the storage of the already broadcast tapes become important. Each tape should be labeled clearly so that anyone may easily know what it contains. As some of the video materials are so valuable in that the images contained can never be obtained again, there also is the need of storing the video materials under special care. This applies also to the program material tapes for use in producing the programs. If they were kept in good order, the images contained in them can be used in various programs, thus helping enhance the efficiency in program

production. Since videotapes are vulnerable to dust, they must be stored in a clean environment.

2) Storage of Programs for Repeat-broadcast

In the case of the tapes containing programs in series which are due to be repeat-broadcast, it is necessary to pay special attention to their management and to easy-to-retrieve classification in order to avoid any trouble obstructing repeat-broadcasts.

3) Program Library

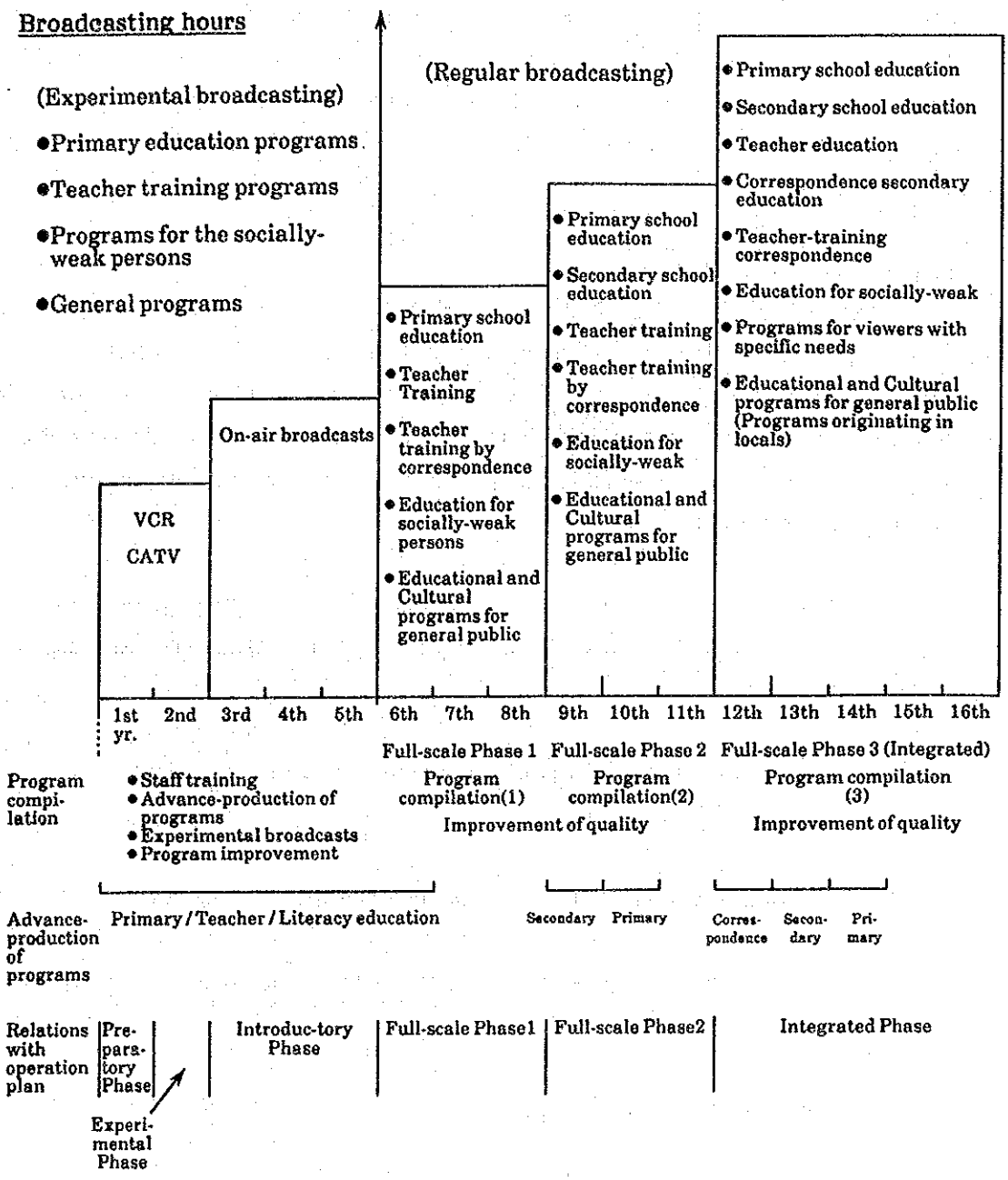
When the programs are accumulated, they will form a valuable program library, an asset of the educational TV broadcasting station. By making effective use of this asset, it will become possible for the station to enrich program contents and to conduct efficient program production.

3.3 Annual Program Compilation Plans

Based on the educational program utilization plan, the annual broadcast program expansion plans will be as shown in the following chart. The entire plans are divided into the Preparatory Phase, Experimental Phase, Introduction Phase, Full-scale Phase and Integrated Phase.

Annual Broadcast Program Expansion Plans (in relation to Educational broadcast Utilization Plan) is shown in Figure 3.3.1.

Figure 3.3.1 Annual Broadcast-program Expansion Plans



(1) Preparatory Phase (1st Year)

The Preparatory Phase, which is the first year to tackle educational TV broadcasting, is an important stage in which basic preparations are made for the operation of a broadcasting station. In this Phase, the following work will be carried out while making various attempts and trials, keeping in close touch with the program consultative committee, production committee and other advisory groups.

(Tasks in the Preparatory Phase)

At the 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 for educational broadcasting, non-existent before, to be added to this educational curriculum, there is the need of devising broadcast programs matching the educational curriculum.

1. Educational curriculum of the primary schools and the programs for the primary schools shall be examined and an effective matching shall be sought.

2. Production of experimental programs on communication and others for the 1st to 3rd graders

3. Training of production personnel for educational programs.

4. Research and development of utilization of educational programs by schools.

(2) Experimental Phase (2nd Year)

In the Experimental Phase, which is the period when the skills developed during the Preparatory Phase for the production of basic programs, are improved further, the programs produced will be transmitted through CATV in order to verify the effectiveness of educational programs on the general public viewers as well as on the classroom teaching at the designated primary schools. It is also a period when measures are taken to increase and train the required number of production personnel.

(Tasks in the Experimental Phase)

In this Phase it becomes possible to produce programs for the 4th to 6th graders of primary schools and to broadcast them on CATV in series for use at the introductory part of the classroom-teaching. Number of school using the broadcast will also increase. Then, what become important are the establishment of the necessary setup on the part of the schools to use the broadcasts and the giving of guidances to the teachers using the broadcasts in their classrooms.

1. Production of experimental programs

   - Science, mathematics, etc., for the 4th to 6th graders of primary schools

   - Programs for teachers.

2. Broadcasts on CATV that are made to coincide with classroom-teaching.

3. Fostering and training of teachers.

4. Testing of the program-evaluation systems at the schools cooperating in the utilization of broadcasts.

(3) Introduction Phase (3rd, 4th and 5th Years)

From this Phase, the transmission of programs will be made by on-air broadcasts. Consequently, the area covered will expand, the number of monitor schools will increase and it becomes possible to obtain evaluations from both the urban and rural regions. The number of general-public receivers of the educational broadcasts will increase, too, making it possible to establish a system of production of general educational programs and live broadcasts of government"s public-relations program, a system that leads to the start of full-sclae broadcasting of educational programs.

(Tasks in the Introduction Phase)

With the start of on-air broadcasts, the audience has now come to large both in number and quality. Necessary steps are taken to study the differences between the urban and rural regions in their needs for educational broadcasting; to examine the ways the information programs necessary for daily life should be produced and broadcast; to produce, in advance, the programs necessary for the full-scale broadcasting; and to strengthen the abilities of production personnel to enable them to cope with everything that confronts them. Thus, a smooth transition to the full-scale broadcasting is made.

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

2. Model schools utilizing broadcasts will be fostered and efforts will be made to promote utilization of broadcasts.

3. Production of government"s public-relations programs.

4. Production of educational programs for the general public.

5. The abilities of production personnel will be strengthened.

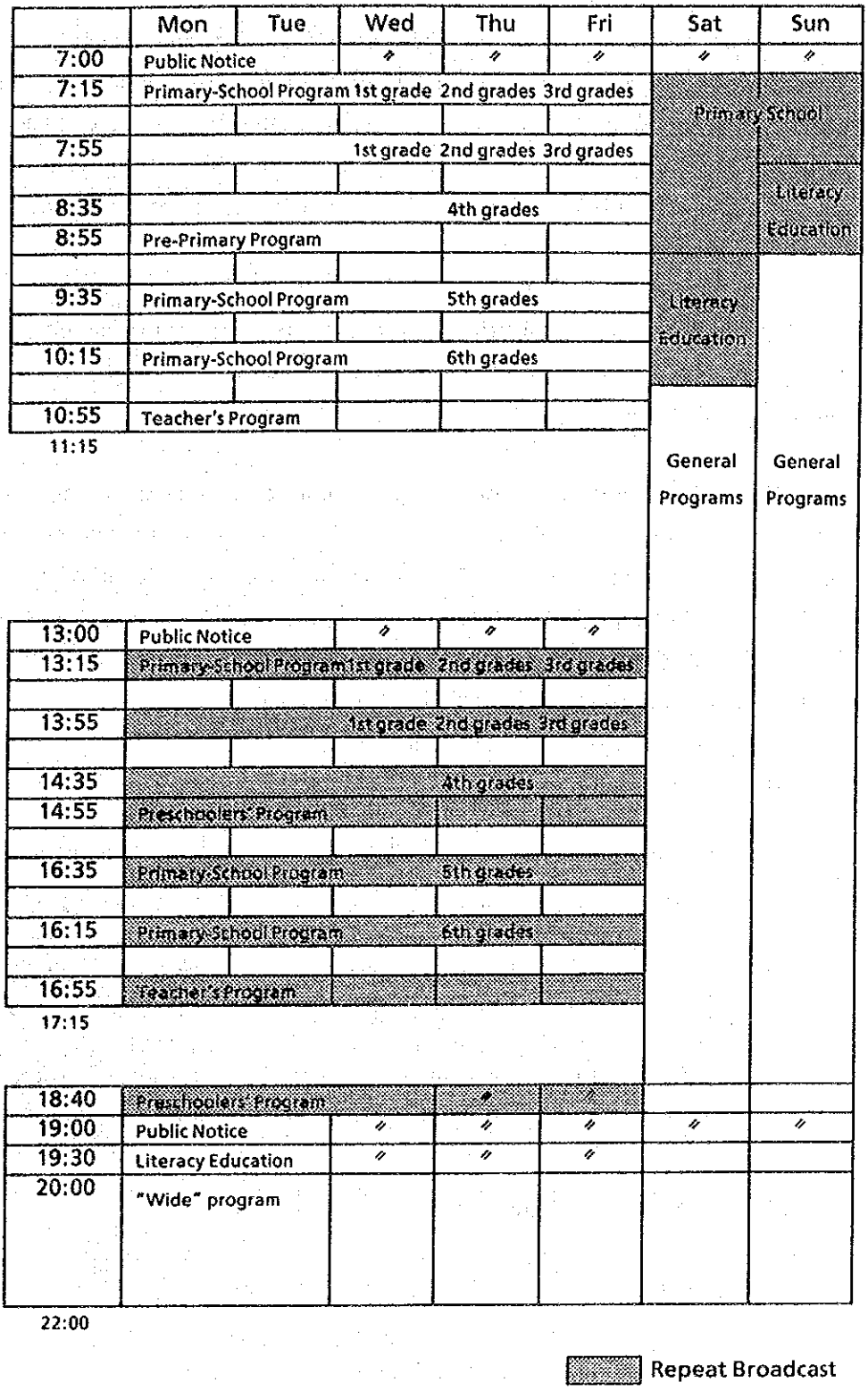
6. The 4th and 5th years will be devoted to advance-production of programs.

3.4 Program Compilation in the Full-scale Phase 1, 2, 3

(1) Program-compilation for the Full-scale Phase 1

The programs to be broadcast in the Full-scale Phase 1 will include the following; for primary education, the primary-school programs and the teacher-training programs, for the socially-weak persons, the literacy-education programs and preschooler programs and, for the general public education, the public=notice, live "wide" and other programs. The Program Compilation Plan 1 is shown in Table 3.4.1.

Table 3.4.1 Full-scale Phase 1 (6th , 7th and 8th Years)



1) School-broadcasts for Primary Education

The school education in Paraguay runs from Monday through Friday, 5 days a week, 40 weeks a year ad 200 days of classes annually. Owing to the shortage of schools, each day is used by being divided into three parts; morning, afternoon and evening. Morning and afternoon are used by primary school, while, a some of the schools, literacy classes are held in the evening.

As for program compilation, the programs for primary schools will be scheduled for broadcast within the school hours of primary school in the morning and in the afternoon.

The school hours of primary schools differ slightly by region. However, in view of the fact that the =school hours at the primary schools located in the educationally-unblessed rural regions run from 7:00 to 11:00 in the morning and from 13:00 to 17:00 in the afternoon, those school hours will be given priority and the broadcast of primary-school programs will be scheduled for such hours.

a) School Hours

Morning class				Afternoon class		
7:00	—	7:15	Morning Assembly	13:00	—	13:15
7:15	—	7:55	1st Period	13:15	—	13:55
7:55	—	8:35	2nd Period	13:55	—	14:35
8:35	—	9:15	3rd Period	14:35	—	15:15
9:15	—	9:35	Recess	15:15	—	15:35
9:35	—	10:15	4th Period	15:35	—	16:15
10:15	—	10:55	5th Period	16:15	—	16:55

b) Broadcast Programs

Target : Primary-school pupils

Broadcast Time : 20 minutes

Subjects : Communication (national languages), etc., for the lower grades (1st to 3rd grades).
Science, mathematics, etc., for the high grades (4th to 6th grades).

Vacant Time : Between one program and the next, there is a vacant time-frame of 20 minutes. As the use of VCRs spreads, these vacant time-frames will be used for broadcasts of such programs as "science experiment", "Countries of the World", educational programs offered by Ibero-america (See 3.2.2 of this Report) and other programs of high archival value, all of which to be recorded on VCR at each school, so as to promote utilization of broadcasts by making effective use of VCRs.

Program Production :

Number of Programs Broadcast Annually	1,000 (Production to be started from two years before)
Number of PDs	26 (in-studio lecture Programs)
Production Span	5 days
Studio-production Crews	5 crews

2) Other educational programs with necessary conditions
In addition to the school broadcast programs, Teacher's, literacy, Pre schooler's, and General public education programs are to be produced for the Full-scale Phase 1 broadcasting.
Those programs with necessary conditions are listed in the Table 3.4.2

Table 3.4.2 Production Resources by Program

New Production	Teachers' Programs	Literacy Programs	Preschoolers' Programs	General Public-education Programs
Broadcast time	20 min.	30 min.	20 min.	Live "wide" 120 min. Public Notice 15—30 min.
Number of programs broadcast anually	200	200	200	Live "wide" 365 Public Notice 1,095
Production span	5 days	5 days	5 days	Live "wide" 7 days
Programs produced in advance	100	100	100	
Production cost per program	400 US$	400 US$	400 US$	Live "wide" 2,000 US$ Public Notice 400 US$
Number of PDs required	50 persons (Total number of PDs required in producing all the programs)			
Studio-production crews Production crews for the entire ETV Center	6th yr. 5 crews (45 persons) + P.P.4 + EDIT2 + EFP4 + TV OB van 5 7th yr. 5 crews (45 persons) + P.P.6 + EDIT4 + EFP6 + TV OB van 6 8th yr. 5 crews (45 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7			
Studio	2 Studios Public Notice (730 programs/year, 1 repeat-broadcasts each, continuity studio)			
Post Production Room	From the 7th year, post-production work becomes necessary for programs procured from outside.			

Programs to be produced in advance for Phase-2	Secondary-school programs	Drama programs	Music programs
7th year	200 programs	120 programs	80 programs
8th year	200	120	80

(2) Program Compilation for the Full-scale Phase-2

The Program Compilation Plan 2 is shown in Table 3.4.3.

1) Enrichment of Educational Programs

a) Improvement of Quality and Expansion of Quantity

This phase between the Phases 1 and 3 is the period that serves as a bridge lining the two Phases, and the major change to take place during this period is the enhancement of quality of programs. There is to be a shift from the programs adopting the direct-teaching method to those using the enrichment teaching method, a presentation method that helps deepen the viewers' understanding of the contents of the program broadcast. In the latter presentation method, a single piece of material is presented in a variety of ways, such as, animations and models. This Phase, at the same time, will be a period in which to further increase the number educational

programs in addition to those already produced and accumulated, thereby preparing for the time of Full-scale program compilation without vacant time-frames in Phase 3.

b) Integration of TV and Classroom

Integration of classroom with TV will also be considered, using various methods of presentation, such as, asking questions in the program and calling on the pupils in the classroom to actually answer such questions.

2) Programs for Secondary Schools

Programs for secondary schools cannot be treated adequately because of the large number of subjects to be dealt with and also because of the clashes occurring in time-frame with the programs for primary schools to which a priority is given in the broadcasting schedule. As for the contents of the programs for secondary schools, priority will be given to such subjects as natural science, health, hygiene, art, social studies and practical work training.

3) General Educational Programs

a) Music Programs

The people of Paraguay ove music so dearly that music is already an integral part of people's daily lives.

There are, in Paraguay, a large number of wonderful traditional pieces of music. The music programs will be so designed as to contribute to the people"s peace of mind and their appreciation of the art.

b) Drama Programs

Production of drama programs, in the case of independent production, takes a great deal of trouble and expense.

Since a good many excellent programs are produced by other countries, such programs will be procured for broadcast in Paraguay.

4) Effective Use of Vacant Time-frames

There is a 20-minute vacant time-frame between one program and the next. As the use of VCRs (video cassette recorders) spreads, these vacant time-frames will be used for broadcasts of such programs as "science experiment", "Countries of the World" and other programs of high archival value, as well as educational programs dealing with different subjects, all of which can be recorded by VCR at the schools, so as to promote the use of broadcasts taking advantage of VCRs. Positive efforts will be made to promote introduction of VCRs into the schools and program compilation will be so conducted as to enable gradual filling of the vacant time-frames with primary-school programs.

Table 3.4.3 Full-scale Phase 2 (9th 10th and 11th years)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
7:00	Public Notice		〃	〃	〃	〃	〃
7:15	Primary-School Program 1st grade 2nd grades 3rd grades					Primary School	
				Effective use of vacant time			
55	1st grade 2nd grades 3rd grades						
				Effective use of vacant time			Literacy Education
8:35	4th grades						
8:55	Preschoolers' Program						
				Effective use of vacant time			
9:35	Primary-School Program 5th grades					Literacy Education	
				Effective use of vacant time			
10:15	Primary-School Program 6th grades						
				Effective use of vacant time			
10:55	Teacher's Program						
11:15	Secondary-school Program					General Programs	General Programs
11:45	Secondary-school Program						
12:15							
13:00	Public Notice		〃	〃	〃		
13:15	Primary-School Program 1st grade 2nd grades 3rd grades						
				Effective use of vacant time			
13:55	1st grade 2nd grades 3rd grades						
				Effective use of vacant time			
14:35	4th grades						
14:55	Preschoolers Program						
				Effective use of vacant time			
15:35	Primary-School Program 5th grades						
				Effective use of vacant time			
16:15	Primary-School Program 6th grades						
				Effective use of vacant time			
16:55	Teacher's Program						
17:15	Secondary-school Program						
17:55	Secondary-school Program						
18:15							
19:00	Public Notice		〃	〃	〃	〃	〃
19:30	Literacy Education					General Programs	General Programs
20:00	Drama						
20:30	"Wide"	program					
22:30	Music program		〃	〃	〃	〃	〃
22:45							

Repeat Broadcast

5) Production Resources by Program (9th, 10th and 11th Years) (Phase 2)

Only the new programs in the Phase 2 are shown in the following Table 3.4.4.

Table 3.4.4 Production Resources by Program

New Production	Secondary-school Programs	Music Programs	Drama Programs
Broadcast time	30 min.	15 min.	30 min.
Number of programs broadcast anually	400	365	250
Production span	5 days	5 days	5 days
Programs produced in advance	400	160	240
Production cost per program	400 US$	800 US$	300,000 US$ a year
Number of PDs required	55 persons (Total number of PDs required in producing all the programs)		
Studio-production crews Production crews for the entire ETV Center	9th yr. 5 crews (50 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7 7th yr. 5 crews (50 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7 8th yr. 5 crews (50 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7		
Studio	2 Studios Public Notice (730 programs/year, 1 repeat-broadcasts each, continuity studio)		
Post Production Room	Music programs, programs procured from outside		
Programs to be produced in advance for Phase-3	Secondary-school programs	Drama programs	Music programs
10th year	200	100	100
11th year	200	100	100

(3) Program Compilation in the Integrated Phase 3

The Plan 3 is shown in Table 3.4.5.

1) Further Enhancement of Program Quality

This is the phase that corresponds to the long period in the Broadcast Utilization Plan and is the stage when the programs will have been enhanced both in quality and quantity. Basically, the Program Compilations 1 and 2 will be used as the foundation on which to additionally start the Correspondence Secondary Course, Technical-skills Course and the Housewives' Hour. The Correspondence Secondary Course, which targets those studying at home, will take up, on a priority basis, the

basic subjects taught at secondary schools, so as to contribute to the fostering of middle-level human resources.

2) Correspondence Secondary Course

The Correspondence Secondary course is targeted to those studying at home and takes up the basic subjects taught at secondary schools, such as, Spanish, mathematics and natural science. Broadcasts will be conducted systematically so as to respond effectively to the aspirations of the highly-motivated people who are studying at home.

Using this Course, efforts will be made to institutionalize teleducation by broadcasts (study at home, schooling, submission of reports and conferment of qualifications).

3) Programs for the Audience with Special Needs

As a program for the audience with special needs, a Technical-skills Course will be established to help the audience acquire skills which are in strong demand.

Different skills will b taken up in each of the courses which will be broadcast during different periods. The skills will include those for computer, architecture, welding and automobile.

4) General Educational Programs

In people's daily lives, a large percentage of activities is accounted for by those of housewives. Therefore, in the general educational programs, wisdom and information that help enrich the daily lives will be included on the basis of opinions and desires expressed in te course of highly-diversified lives of housewives. The programs will be so designed as to be useful to the people in planning their sound family lives and in bringing up the children who are to shoulder the nation'"s future. In Paraguay, the infant mortality is as high as 4.5% (as compared with 0.5% in Japan). Emphasis, therefore, will be placed on the inclusion in the broadcasting schedule of such programs as child-rearing, hygiene and nutrition.

5) Broadcasting of Programs Originating in the Regions

With the aim of enhancing the living standards and cultural levels of the regions, broadcasting of the programs originating in the regions will be started. Using the time-frames for Public Notices and "Wide" Programs, regional news and traditional cultures will be broadcast either on the local or the national network with the aim of enhancing the levels of regional cultures.

6) Dissolution of Vacant Time-frames

Assuming that VCRs will eventually spread among the primary schools to enable the use of recorded programs in the classes, the vacant time-frames will also be filled with primary-school programs.

Table 3.4.5 Full-scale Phase 3 (Integrated) (12th year on ward)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
7:00	Public Notice		〃	〃	〃	〃	〃
7:15	Primary-School Program 1st grade 2nd grades 3rd grades					Primary School	
7:35	1st grade 2nd grades 3rd grades						
7:55	1st grade 2nd grades 3rd grades						
8:15	1st grade 2nd grades 3rd grades						Literacy Education
8:35	4th grades						
8:55	Preschoolers' Program						
9:15	4th grades					Literacy Education	
9:35	5th grades						
9:55	5th grades						
10:15	6th grades						
10:35	6th grades						
10:55	Teacher's Program					General Programs	General Programs
11:15	Secondary-school Program						
11:35	Secondary-school Program						
11:55	Technical-skills Program						
12:25	Housewives' Hour						
12:15							
13:15	Primary-School Program 1st grade 2nd grades 3rd grades						
13:35	1st grade 2nd grades 3rd grades						
13:55	1st grade 2nd grades 3rd grades						
14:15	1st grade 2nd grades 3rd grades						
14:35	4th grades						
14:55	Preschoolers' Program						
15:15	4th grades						
15:35	5th grades						
15:55	5th grades						
16:15	6th grades						
16:35	6th grades						
16:55	Teacher's Program						
17:15	Secondary-school Program						
17:35	Secondary-school Program						
17:55	Housewives' Hour						
18:15							
18:30	Public Notice		〃	〃	〃	〃	〃
19:00	Correspondence Secondary Course		〃	〃	〃	General Programs	General Programs
19:30	Correspondence Secondary Course		〃	〃	〃		
20:00	Literacy Education		〃	〃	〃		
20:30	Technical-skills Program		〃	〃	〃		
21:00	Drama	〃	〃	〃	〃		
21:30	"Wide"	program	〃	〃	〃	〃	〃
23:00	Music program		〃	〃	〃	〃	〃
23:15							

Repeat Broadcast

7) Production Resources by Program
(12th, 13th and 14th Years) (Phase 3)

Only the new programs in the Phase 3 are shown in the following Table.

Table 3.4.6 Production Resources by Program

New Production	Correspondence Secondary Programs	Technical-skills Course	Women's Hour
Broadcast time	30 min.	30 min.	20 min.
Number of programs broadcast anually	400	250	250
Production span	5 days	5 days	5 days
Programs produced in advance	400	200	200
Production cost per program	400 US$	600 US$	600 US$
Number of PDs required	60 (Ds required for the entire program production)		
Studio-production crews Production crews for the entire ETV Center	12th yr. 5 crews (50 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7 13th yr. 5 crews (50 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7 14th yr. 5 crews (50 persons) + P.P.8 + EDIT4 + EFP8 + TV OB van 7		
Studio	2 Studios Public Notice (730 programs/year 1 repeat-broadcasts each continuity studio)		
Post Production Room	Music programs and programs procured from outside		

Table 3.4.7 shows Required Program Productions with the Production staff and Table 3.4.8 shows yearly Development plan of Production and Necessary No. of PDs.

Table 3.4.7 Required Program Productions with The Production Staff

Name of Program	Package/ Live	Program (Min.)	Production Resource	Required Pro. Number per Year at the end of Priority Project	Preparatory Phase 1st	Experimental Phase 2nd	Introduction Phase 3rd	Introduction Phase 4th	Introduction Phase 5th	Full scale Phase (1) 6th	Full scale Phase (1) 7th	Full scale Phase (1) 8th	Phase 2 9th
Primary School Programs 1st~6th grade	P	20'	Studio	5pro. x 5 day x 40week = 1,000	50	160	(Note 1) 480	(Note 2) 640	(1,000) 200	150 (New) 150 (Rev.)	150 (New) 150 (Rev)	(1450) 150 (New) 150 (Rev.)	200
Pre-Primary Shool Hour	P	20'	Studio	5pro. x 40 (w) = 200					800	now 3 (200) 100	40	(280) 40	20
Teacher's Hour	P	20'	Studio	5pro. x 40 (w) = 200				800 (1,440)	(100)	(200) 100	40	(280) 40	20
Illiterate Hour	P	30'	Studio	5pro. x 40 (w) = 200					(100)	(200) 100	20	(240) 20	20
Educ. Wide	①	120~90'	Studio	365				156 (Test)	365 (Test)	365	365	365	365
Public Notice (News)	①	15'~30'	Cont. St. (M.C.R)	3 x 365 days						730	730	730	730
General Programs on Sat.s & Sun.s	②①		P.P. Rooms TV 08 van	Presented Programs, live sports, Events and for sales	Equip. Installation	Periferal Conditions TX. St. Fac. → Population Coverage 40%	ETV Center TV 08 VAN STLs EFP & P.P. Rooms 3 regional st.s			Pro. No = P.D x 200 ÷ 5 9PDs ((50))08 (360)	4PDs ((50))08 (160)	4PDs ((50))08 (160)	11PDs ((50))08 (440)
Secondary School I	P	30'	Studio	5 x 40 (w) = 200	Broadcast. Media	VCRs CATV	CATV	CATV	CATV		100	100	40
Secondary School II	P	30'	Studio	5 x 40 (w) = 200			Transmitting from Asuncion TX				100	100	40
Drama	P	30'	P.P. Room	5 x 50 (w) = 250	Mec. St.		M.C.R & operations				(120)	(120)	(40)
Music	P	15'	P.P. Room	7 x 50 (w) = 350	IPT st						(80)	(80)	(100)
Remarks		Required Program Product. with its prod. spans.	Total No. of Studio Programs		50	160	480	796	1,165	965	965	965	845
(Note 1) By provision of new re-enforcement production equipment as well as Transmitter the operation will be much practical			Total No. of P. P. Programs		—	—	—	—	—	(360)	(360)	(360)	(580)
			Prod. Condition Production Span days		20	10	5	5	5	5	5	5	5
			Live program productions for "Wide" "News" with Production Span		—	—	—	156 7	365 7	365 +(30) 7	365 +(30) 7	365 +(30) 7	365 +(30) 7
(Note 2) From this year, accumulation of packaged E. programs will be started.	Required No. of Producers with Assist. PD.s for yearly Development		Total No. of Producers CPDs		8	11	15	26	40	50	50	50	55
			No. of PDs (for St. Package)		8	11	15	16	20	24	24	24	21
			No. of PDs (for P. P. Room)		—	—	—	—	—	9	9	9	15
			No. of PDs (for Live)		0	0	0	10	12	17	17	17	19
(Note 3) By completion of ETV Center, the operation becomes full scale broadcasting.			No. of Assist. PDs (OJT)		4	6	6	8	13	—	—	5	—
			No. of Art Designers		3	5	7	9	11	12	12	12	12
	Required No. of Engineers & Technicians for yearly Development		Studio Expert Crews		10	20	30	40	50	The total 96 staff are assigned for the details, for various duties of the ETV Center, please see the Table 4.4.			
			TV. Transmitter Engineers		0	2	4	5	6				
			M. C. R Staff		0	0	11	18	20				
			New Engineers & Technicians		0	0	0	0	20				

Table 3.4.8 Yearly Development Plan of Production and Necessary No. of PDs

Name of Program	Package/ Live	Program (Min.)	Production Resource	Required Pro. Number per Year	Pilot Stage	Full scale Phase 1			Full scale Phase 2			Integrated Phase (3)		
						6th	7th	8th	9th	10th	11th	12th	13th	14th
Primary School Programs 1st~6th grade	P	20'	Studio	5pro. x 5 day x 40week = 1,000	1,000	150 (New) 150 (Rev.)	150 (New) 150 (Rev)	(1450) 150 (New) 150 (Rev.)	200	200	(2,050) 200	200	200	(2,650) 200
Pre-Primary Shool Hour	P	20'	Studio	5pro. x 40 (w) = 200	100	(200) 100	40	(280) 40	20	20	(340) 20	20	20	(400) 20
Teacher's Hour	P	20'	Studio	5pro. x 40 (w) = 200	100	(200) 100	40	(280) 40	20	20	(340) 20	20	20	(400) 20
Illiterate Hour	P	30'	Studio	5pro. x 40 (w) = 200	100	(200) 100	20	(240) 20	20	20	(300) 20	20	20	(360) 20
Educ. Wide	①	120~90'	Studio	365	(Test)	365	365	365	365	365	365	365	365	365
Public Notice (News)	①	15'~30'	Cont. St. (M.C.R)	3 x 365 days	(Test)	730	730	730	730	730	730	730	730	730
General Programs on Sat.s & Sun.s	⑥①		P.P. Rooms TVOB van	Presented Programs, live sports, Events and for sales	(PG. No.) (Prog. No.)	Pro. No = P.D x 200 ÷ 5 9PDs ((50)) OB (360)	4PDs ((50)) OB (160)	4PDs ((50)) OB (160)	PDs for Enrichment 11PDs ((50)) OB (440)	5PDs ((50)) OB (200)	5PDs ((50)) OB (200)	PDs for Integrated 10PDs ((50)) OB (400)	10PDs ((50)) OB (400)	10PDs ((50)) OB (400)
Secondary School I	P	30'	Studio	5 x 40 (w) = 200			100	100	40	40	40	20	20	20
Secondary School II	P	30'	Studio	5 x 40 (w) = 200			100	100	40	40	40	20	20	20
Drama	P	30'	P.P. Room	5 x 50 (w) = 250			(120)	(120)	(40)	(40)	(40)	(40)	(40)	(40)
Music	P	15'	P.P. Room	7 x 50 (w) = 350			(80)	(80)	(100)	(100)	(100)	(100)	(100)	(100)
Distant E. for 2nd Shool 1	P	30'	Studio	5 x 40 (w) = 200						100	100	100	100	100
Distant E. for 2nd Shool 2	P	30'	Studio	5 x 40 (w) = 200						100	100	100	100	100
Vacational	P	30'	E.F.P. + P.P	5 x 50 (w) = 250						(100)	(100)	(100)	(100)	(100)
Women's Hour	P	20'	Studio	5 x 50 (w) = 250						100	100	100	100	100
Number of Studio Programs	P		Studios		1,300	965	965	965	845	1,005	1,005	965	965	965
No. of P.P. Rooms	P		P.P. Rooms			(360)	(360)	(360)	(580)	(440)	(440)	(640)	(640)	(640)
No. of P.Ds for Studio				No. of Pro. x 5 ÷ 200	20	24	24	24	21	25	25	24	24	24
No. of P.D for P.P.				No. of Pro. x 5 ÷ 200	3		5	5	4	6	6	6	6	6
No. of P.D for Journal	①				8	17	17	17	19	19	19	20	20	20
Sub total of St. & Journal					23 + 8	(41)	(46)	(46)	(39)	(45)	(45)	(45)	(45)	(45)
PDs Total					5~40	50	50	50	55	55	55	60	60	60

CHAPTER 4 BROADCASTING NETWORK PLAN

4.1 Basic Policy of Broadcasting Network Plan

The broadcasting network plan was compiled with emphasis on the following points:

(1) The Broadcasting Network shall be based upon the basic policy of the Educational Broadcasting Utilization and Development plan.

(2) Utilization of ANTELCO microwave network shall be considered.

The program transmission of this broadcasting network plan can be based on the digital microwave networks, the use of which is expected to start in March, 1993. This digital microwave network will connect major cities as Asuncion, Encarnacion, and Ciudad del Este and is considered to be optimal for expanding the broadcasting network in the densely populated south eastern region.

(3) Joint use of ANTELCO antenna tower with associated facilities shall be considered.

A fairly high construction cost will be required in case of that new antenna towers and building are installed to all transmitting stations. Therefore, ANTELCO antenna towers already exiting in each transmitting station should be used as far as possible for the plan, provided that their tower strength and vacant spaces can meet the requirements of new TV stations, also provided that there in no electro-magnetic interference occurred between the TV Transmitter equipment and the existing microwave transmission equipment of ANTELCO.

(4) Selection of high-altitude transmitting points and ensuring wider service areas.

a) The major boarder cities of Paraguay, such as Encarnacion, Pilar Conception are located along the border river-side where altitude is low. Therefore, it is necessary to select high-altitude in-land transmitting point so as to obtain wider service coverage including the city as well as the vicinity areas.

b) Villarrica station
Villarrica is situated almost at the center of south eastern part of Paraguay with a service area of large population.
By installing a TV transmitter on a top of a mountain near Villarrica city, a wider service coverage can be obtained.

(5) The planning should be respectful to the agreement reacted among four countries, Brazil, Argentina, Uruguay and Paraguay on the use of VHF Frequencie's Assignment.

(6) Efforts will be made to adjust antenna directivity to avoid interferences to the neighboring countries.
Since Paraguay is a inland country surrounded by Brazil, Argentina, and Uruguay, antenna directivity and power distribution must be paid attention to minimal interference to the adjacent countries.

4.2 Principle of Frequency Assignment

4.2.1 General

Considering the present broadcasting condition in Paraguay that the broadcasting is carried out on PAL-N system with American channels, the TV channel assignment under the Master Plan must be made in accordance with the American system on the basis of the following principles. In addition, the channel assignment must be made as much as possible in accordance with the VHF frequency assignment based in the agreement among such four countries as Brazil, Argentina, Uruguay, and Paraguay.

4.2.2 VHF Channel

(1) The channels as listed in Table 4.2.2.1 are used for VHF.

(2) Channel assignment in the same area:

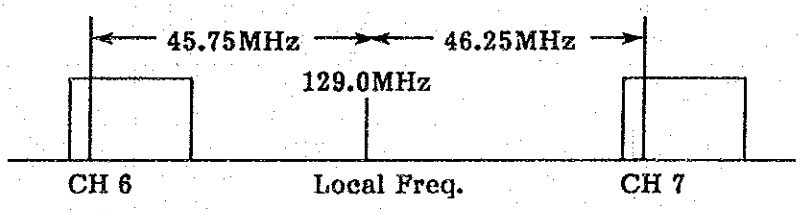
The optimum channel must be selected from the following groups by introducing the idea of family channels and taking the already existing or future planned channels into consideration:

Group 1: Channels 2, 4, 5, 7, 9, 11, and 13

Group 2: Channels 2, 4, 6, 8, 10, and 12

Group 3: Channels 3, 5, 7, 9. 11, and 13

(3) It is desirable to avoid simultaneous assignment of Channels 6 in Band I and 7 in Band III in the same area, because Channels 6 and 7 are simultaneously assigned in the same area, Channel 7 will give image interference to Channel 6.



As reference, TV receiver's typical performance of PAL-N system is shown in the Supporting Report "page 1".

Table 4.2.2.1 TV Channels' Frequency in Paraguay

(Horizontal line : 625, Bandwidth : 6MHz)

(For VHF bands)

Band I		Band II	
Ch	Frequency range	Ch	Frequency range
1	~	7	174 ~ 180
2	54 ~ 60	8	180 ~ 186
3	60 ~ 66	9	186 ~ 192
4	66 ~ 72	10	192 ~ 198
5	76 ~ 82	11	198 ~ 204
6	82 ~ 88	12	204 ~ 210
		13	210 ~ 216

(For UHF bands)

Band IV and V					
Ch	Frequency range	Ch	Frequency range	Ch	Frequency range
14	470 ~ 476	38	614 ~ 620	62	758 ~ 764
15	476 ~ 482	39	620 ~ 626	63	764 ~ 770
16	482 ~ 488	40	626 ~ 632	64	770 ~ 776
17	488 ~ 494	41	632 ~ 638	65	776 ~ 782
18	494 ~ 500	42	638 ~ 644	66	782 ~ 788
19	500 ~ 506	43	644 ~ 650	67	788 ~ 794
20	506 ~ 512	44	650 ~ 656	68	794 ~ 800
21	512 ~ 518	45	656 ~ 662	69	800 ~ 806
22	518 ~ 524	46	662 ~ 668		
23	524 ~ 530	47	668 ~ 674		
24	530 ~ 536	48	674 ~ 680		
25	536 ~ 542	49	680 ~ 686		
26	542 ~ 548	50	686 ~ 692		
27	548 ~ 554	51	692 ~ 698		
28	554 ~ 560	52	698 ~ 704		
29	560 ~ 566	53	704 ~ 710		
30	566 ~ 572	54	710 ~ 716		
31	572 ~ 578	55	716 ~ 722		
32	578 ~ 584	56	722 ~ 728		
33	584 ~ 590	57	728 ~ 734		
34	590 ~ 596	58	734 ~ 740		
35	596 ~ 602	59	740 ~ 746		
36	602 ~ 608	60	746 ~ 752		
37	608 ~ 614	61	752 ~ 758		

For TV receivers using American channels, as shown in Table 4.2.2.1, the video intermediate frequency of Channel 6 is 45.75 MHz. On the other hand, when signal of Channel 7 are converted into intermediate frequency signals in the TV receivers, the frequency of the signals becomes 46.25MHz, as a result, a 500-kHz beat will be generated between the converted signals and video intermediate frequency signals. The representative characteristics of TV receivers being used in Paraguay are listed in the Supporting Report.

(4) When a co-channel is used by two stations, the distance between both stations must be 305km or more under the following conditions. Besides, adjacent channels are used by two stations, the distance between both stations must be 96km or more.

Channel 2 ~ 6: 100kW (ERP)
Channel 7 ~ 13: 310kW (ERP)

	distance
Co-channel stations	305 km
adjacent channel stations	96 km

(5) When the co-channel is used by two stations which separation distance does not reach 305km, a 10.417kHz offset carrier system must be adopted so as to realize the co-channel assignment.
For instance, Fv-0kHz, Fv-10.417kHz, and Fv+10.417kHz, respectively.

The offset carrier frequency is derived from the next relationship with F_H. in the following formula.
$F_H \times 2/3 = 15.625\text{kHz} \times 2/3 = 10.417\text{kHz}$.

(6) The combination to be avoided in the case of assigning TV and FM channels in the same area:

1) (Fv+IFv=) $F_{tvL}=F_{fm}$ The local oscillator frequency of TV Channel 2 or 3 will interfere with 101.0 or 107.0MHz FM waves.

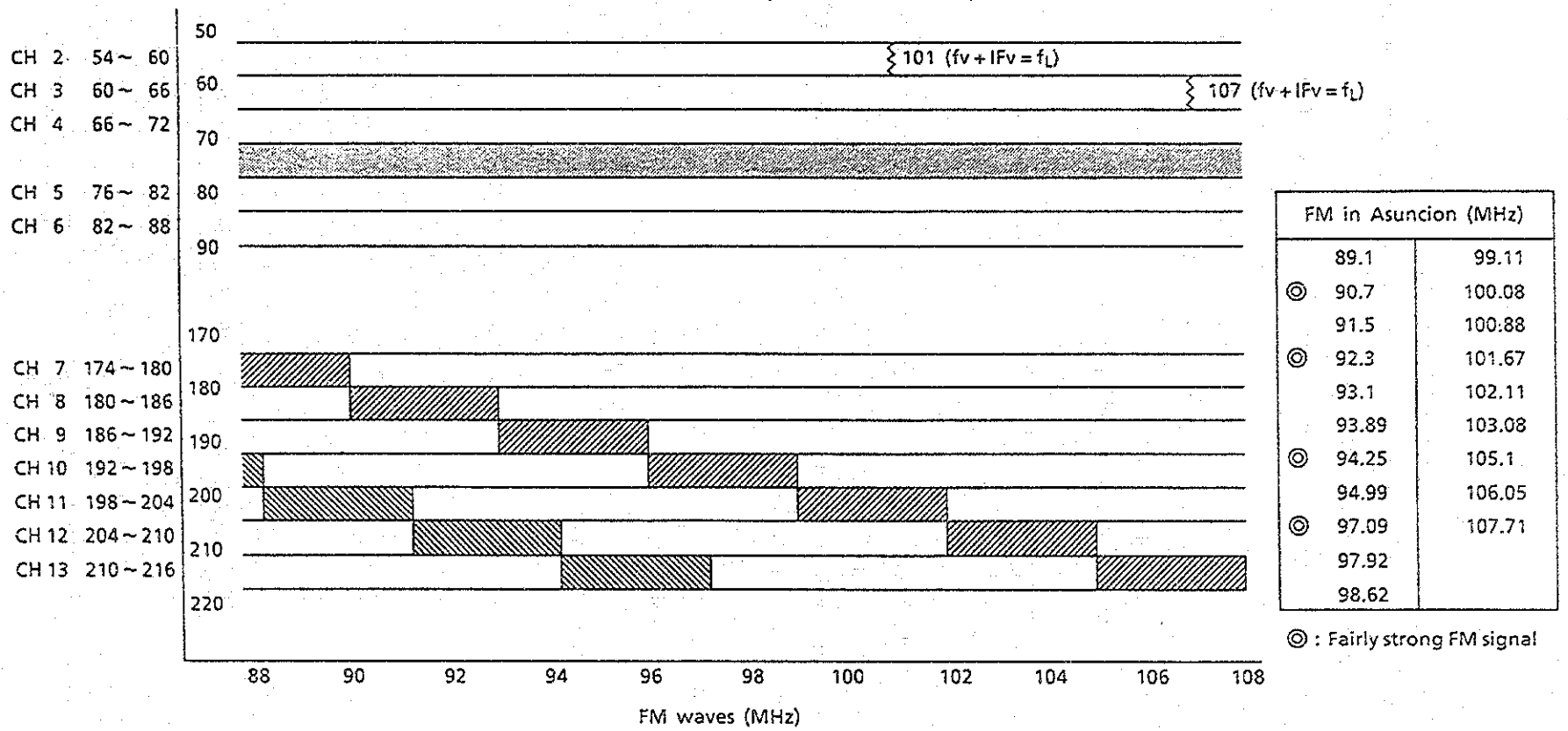
2) $2 \times F_{fm} = F_{tv}$ The 2nd harmonic of FM carrier frequency will interfere with TV channels in Band III.

3) $(F_{fm}+10.7=) F_{fmL} \times 2 = F_{tv}$ The 2nd harmonic of local oscillator frequency of FM receivers will interfere with the TV channels in Band III
The 10.7MHz is the intermediate frequency of FM receivers.

The above-mentioned interrelationship is listed in Table 4.2.2.2.

(7) Field strength curve used for this frequency assignment planning, ERP which is decided from the distance and antenna height must be calculated based on the FCC curve.

Table 4.2.2.2 Diagram showing potential sources of interference between VHF/FM transmissions and TV transmissions in Band I and III (American channel)



: Local oscillator of TV receiver tuned to channel 2 or 3 interfering with FM band (Band II).
$fv + IFv = f_{FM}$

: Second harmonics of VHF/FM carrier interfering with Band III.
$2 \times f_{FM} = f_{TV}$

: Second harmonics of VHF/FM local oscillator interfering with Band III (TV).
$2 (f_{FM} + 10.7) = f_{TV}$

4.2.3 UHF Channel

(1) UHF channels must follow the frequencies shown in the Table 4.2.2.1. In this table, the purpose of each channel is regulated in accordance with the policy of the government as follows.

(a-1)※1 Channels 14~20:The purpose of these channels must be determined by the four countries. ANTELCO, however, will propose the use of UHF CH 14~20 for ETV at the above meeting.

(a-2) Channels 21~39:For pay-TV use.

(a-3) Channels 40~69:Broadcasting use.

※1 Usage plan of UHF CH 14~20 is described in article of (6).

(2) Merit of channel 14~20

Channels 14~20 have low propagation loss of 3 dB in comparison of CH 40~69, as a result, transmitting scale can be reduced of half power. These channels, therefore, is suitable for 1st channel plan stations, and CH40~69 for 2nd channel plan stations.

(3) Plural channel assignment in the same area

In the case of assigning channels in same area, the optimum channels must be selected by introducing the idea of family channels and taking already existing channels into consideration.

Table 4.2.3.1 List of Family Channels

Group No.	Family Channel		
	TV broadcasting use		Pay TV use
Group 1:	CH 14, 20, 17	44, 50, 56, 62, 68	26, 32, 38
Group 2:	CH 15, 18	45, 51, 57, 63, 69	21, 27, 33, 39
Group 3:	CH 16, 19	40, 46, 52, 58, 64	22, 28, 34
Group 4:	CH 17, 14, 20	41, 47, 53, 59, 65	23, 29, 35
Group 5:	CH 18, 15	42, 48, 54, 60, 66	24, 30, 36
Group 6:	CH 19, 16	43, 49, 55, 61, 67	25, 31, 37

(4) Separation distance between co-/adjacent-channel stations in the case of UHF.

When a co-channel is assigned to two stations, the separation distance of the two stations must be 280km or more, and the separation distance of the two stations must be 88km or more in the case of adjacent channels.

(5) Offset carrier frequencies

When the distance between two co-channel stations is closer than 280km, an 10.417kHz offset carrier system must be adopted, for instance, Fv-0kHz, Fv-10.417kHz, and Fv+10.417kHz respectively.

(6) Usage Plan of UHF Ch 14~20

1) Equitable allocation among neighboring countries.

Since these channels have much advantage in comparison with the higher channels of UHF (Ch 40~69) in terms of wider coverage being obtained, by the 3 dB less propagation loss. These channels must be used fairly among the neighboring countries such as between Paraguay and Argentina and/or Brazil.

2) Available channel groups

The available channels within a same area, such as Ciudad del Este, Encarnacion and Asuncion areas, the following channel groups can be used with 2 channels apart each other.

Group A : Ch 14, 17, 20
Group B : Ch 15, 18
Group C : Ch 16, 19

} these groups are to be used equitably between/among the neighboring countries

3) Purpose of the usage of low UHF channels

a) For public or governmental broadcasting such as national educational broadcasting/open university broadcasting and the like.

b) For mixed area with VHF and UHF broadcasting service.
Low UHF channel should be used to get same service area of VHF broadcast.

c) For an important UHF TV station in terms of social and economic view points
Provided that there is no VHF channel available in the area.

4) UHF-TV Station (CH14~20) each must be adopted offset carrier system.
It is absolutely necessary for these stations to avoid the inter-modulation interference among 3 stations which has equal channel spacing.
Intermodulation is the cause of carrier zero beat by the following relations; 2B-C ⇒ A or 2B-A ⇒ C.
Here, A, B and C: channel numbers which has a equal channel spacing
A<B<C: channel C is highest channel in the 3 channels.

5) Required separation distance for network plan between 2 stations which have a co-channel relation in the case of non offset carrier system or adjacent channel.

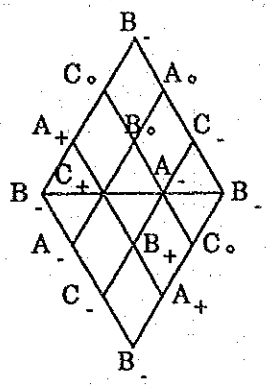
Separation distance between co-channel transmitters :	280km (non off-set carrier)
Separation distance between adjacent channel transmitters :	88km

If the separation distance between co-channel stations is slightly less than the above distance, an off-set carrier method shall be adopted.

6) Practical assignment of the UHF low Band in Paraguay and the neighboring country (s).

Considering above mentioned conditions, the following allocation of low UHF Band would be recommendable.

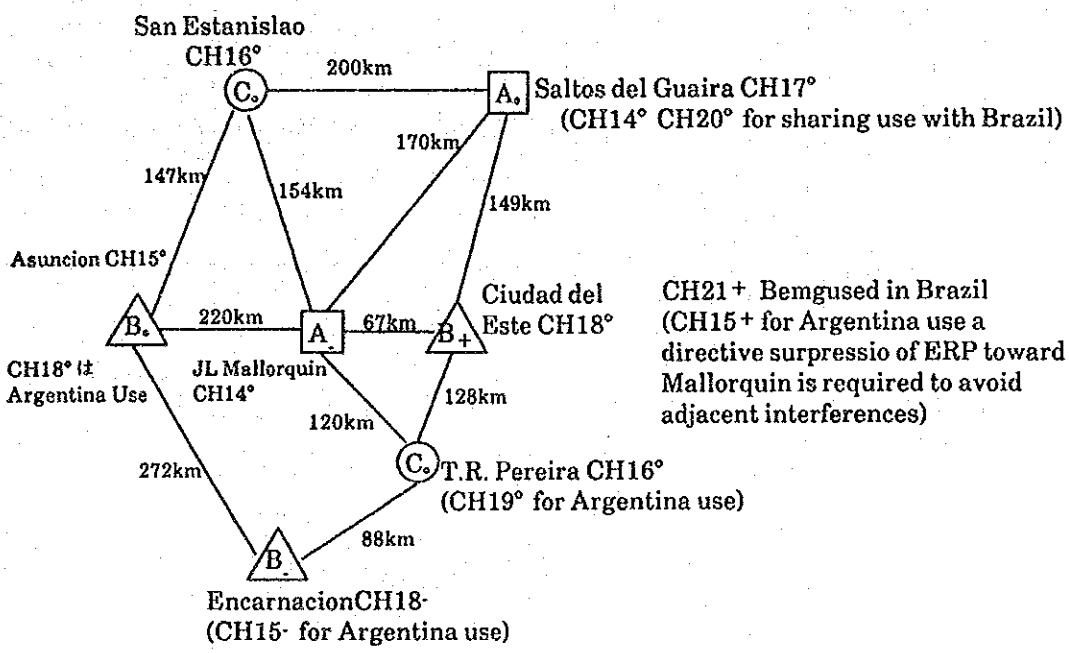
According to the required separation distance mentioned above, the figure of a triangular lattice, shown below, with triangles being separated 90 kilometers away from one another as its constituent elements, will be the base to obtain the maximum number of stations to be established by Group A, B, and C Stations, which are adjacent to one another.



In this case, the distance between two co-channel stations is 90km× $\sqrt{3}$ = 156km. This less than the required distance. All the stations, therefore, should employ the precision off-set carrier system.

If this figure of a triangular lattice is matched to the map of Paraguay, equitable assignment of channels on bordering areas will be made possible.

Figure 4.2.3.1 Example of UHF Channel Assignment (CH14~20)



4.2.4 Required Field Strength and Interference Protection Ratio.

Table 4.2.4.1 indicates 1) the required field strength, 2) service grades and 3) necessary protection ratio from interference, according to the regulations of the Paraguay government.

Table 4.2.4.1 Technical Standard on Required Field Strength, Service Grade and Protection Ratio from Interference

Item		CH2 ~ 6		CH7 ~ 13		CH14 ~ 69	
(1) Protected field strength E(50, 50) dBu/m		58		64		70	
(2) Service grade E (50, 50) dBu/m							
(a) Service Area Primary		74		77		80	
(b) Service Area Urban		68		71		74	
(c) Service Area Rural		54		60		70	
(3) Interference Protection ratio D (50, 50) / U (50, 50) (dB)	Co-channel	With offset	Without offset	With offset	Without offset	With offset	Without offset
		+28	+45	+28	+45	+28	+45
		D value is 58dBu/m		D value is 64dBu/m		D value is 70dBu/m	
	Upper adjacent channel	-12		-12		-12	
	Lower adjacent channel	-6		-6		-6	

D : Desired wave
U : Undersired wave

4.3 Method of Channel Assignment

4.3.1 Principle of channel assignment for TV stations

(1) Those channels that are specified in the resolutions adopted by the four countries VHF Frequency Assignment Conference shall be given priority.

(2) When channels specified in (1) above are not available due to incoming interweaves from other stations, other VHF channels are to be chosen, but, enough D/U ratio for co-channels or adjacent channels shall be obtained.

(3) If no VHF clear-channels are available, UHF channels shall be used as below.
For the 1st plan stations: CH14~20
For the 2nd plan stations: CH40~69

(4) UHF channels shall be chosen from existing vacent channels among the same family channels with already used channel.

4.4 Broadcasting Network Plan

4.4.1 Object Areas for Channel Assignment in 1st and 2nd Channel Plans

(1) 1st channel plan stations

Those stations shall receive TV signal from ANTELCO microwave link and cover major important cities.

(1) Asuncion	(8) Filadelfia
(2) Ciudad de Este	(9) Pilar
(3) Encarnacion	(10) Concerpcion
(4) Villarrica	(11) San Ignacio
(5) P.J.Caballero	(12) Tomas R.Pereira
(6) Saltos del Guaira	(13) Dr. J.L.Mallorquin
(7) San Estanislao	

(2) 2nd channel plan stations.

Those stations are to receive TV signal from 1st plan station (mother station) by air or receive from ANTELCO line.
Each station covers relatively high density population cities.

(1) San Pedro de Parana	(6) San I.de Curuguaty
(2) Ñacunday	(7) Yby Yau
(3) San Alberto	(8) Capitan Bado
(4) Jose Fasardy	(9) Pozo Colorado
(5) San Pedro	(10) Mcal. Estigarribia

4.4.2 Results of Channel Assignment

Results of field strength measurements carried out in 12 cities, including Asuncion, Ciudad del Este, Encarnacion, etc., are given in the Supporting Report. The final channel assignment which has been decided by analyzing and studying the data given in Table 4.4.2.1 which takes into account of International Meeting on VHF Frequency Assignment among Four Countries and also takes into consideration co-channel and adjacent-channel interference, ERP, and broadcast limiting requirements. In addition, assigned channel results

and mutual relations between existing stations in Paraguay and in adjacent countries of co- or adjacent-channels are shown in Figure 4.4.2.1.

Table 4.4.2.1 Results of Channel Assignment

	Cities	CP resolutions		Assigned channel	Assigned ERP (kW)	Observations
		CH	ERP (kW)			
1st Plan Stations	(1) Asuncion	6	40	6	90 *2	(No provision has been decided by CP Meeting) Radiation toward Agrentine must be very limited.
	(2) Cudad del Este	2	5	18+ *1	90	(Provision of CP Meeting are not applied to UHF.) Radiation toward Brazil limited.
	(3) Encarnacion (Depart. Itapua)	5	40	18-	90	CP provision: Radiation toward Argentine must be reduced by 3dB.
	(4) P.J. Caballero (Depart. Amambay)	5+	3	11	6 *2	(Provision of CP Meeting are not applied to UHF.) Radiation toward Brazil must be reduced by 3dB.
	(5) Salto del guaira (Depart. San Pedro)	13-	10	17°	30	CP provision: (a) Radiation toward Iguatemi must be reduced by 3dB. (b) Radiation toward Perola must be reduced by 3dB.
	(6) San Estanislao (Depart. San Pedro)	4-	1	16° *1	60	(No provision has been decided by CP Meeting)
	(7) Filadelfia (Depart. Boqueron)	7	10	7	46 *2	(No provision has been decided by CP Meeting) No Limitation has been imposed upon radiation.
	(8) Villarrica (Depart. Guaira)	10	10	2 *2	60 *2	(No provision has been decided by CP Meeting) Radiation toward Ybytruzu Mountains must be reduced by 3dB.
	(9) Pilar (Depart. Concepcion)	12	40	12	16	(No provision has been decided by CP Meeting) Radiation toward Argentine must be reduced by 6dB.
	(10)Conception (Depart. Conception)	5	10	9	20 *2	(No provision has been decided by CP Meeting)
	(11)San Ignacio (Depart. Misiones)	11	10	5	15 *2	(No provision has been decided by CP Meeting) No Limitation has been placed upon radiation.
	(12)Tomas R. Pereira (Depart. Ita Pua)	9	10	16+ *1	30 *2	(No provision has been decided by CP Meeting)
	(13)Mallorquin (Depart. Alto Parana)	11	6	14+ *1	30	(Provisions of CP meeting are not applied to UHF)

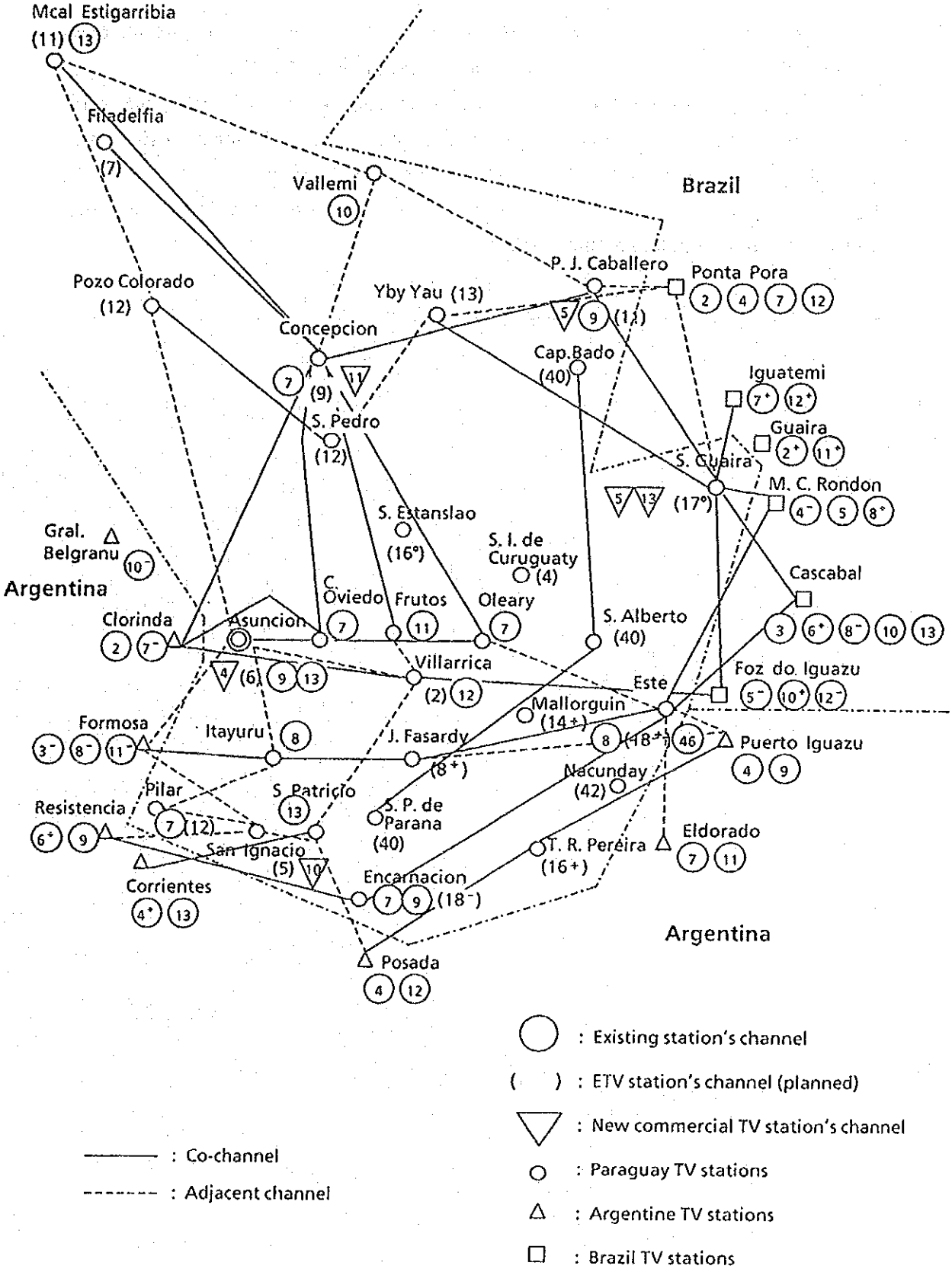
	Citles	CP resolutions		Assigned channel	Assigned ERP (kW)	Observations
		CH	ERP (kW)			
2nd Plan Stations	(1) San Pedro de Parana (Depart. Itapua)	9+	4	40 *1	28	No provision has been decided CP meeting.
	(2) Nacunday (Depart. Alto Parana)	-	-	42	1.5	Ditto
	(3) San Alberto (Depart. Guaira)	3-	1	40 *1	12	Ditto
	(4) Jose Fasardi (Depart. Guaira)	4+	1	8 *2	1.5	Ditto
	(5) San Pedro (Depart. San Pedro)	12	20	12	27 *2	Ditto
	(6) San I. de Curuguaty (Depart. Canindeyu)	4	10	4	1.5	Ditto
	(7) Yby Yau (Depart. Concepcion)	-	-	13	1.5	Ditto
	(8) Capitan Bado (Depart. Amambay)	10	20	40 *1	2	Ditto
	(9) Pozo Colorado (Depart. Pte. Hayes)	12	10	12	1.5	Ditto
	(10) Macal. Estigarribia (Depart. Boqueron)	10	10	11 *2	1.5	Ditto

*1 : While VHF assignment was determined at the Four-Country Frequency adjustment Meeting, this channel assignment is made by using UHF. UHF was not included in the objective of the meeting.

*2 : This assigned channel or ERP is different from the resolution of the Four-Country Frequency Adjustment Meeting, because there are TV waves arriving from neighboring countries and it is necessary to obtain wide service areas. For border areas, however, TV radiation toward adjacent countries is minimal.

*3 : CP (Cuatripartita) means the Four-Country Frequency Adjustment Meeting.

Figure 4.4.2.1 Relations among each TV station's Channel



4.4.3 Service Areas and Covered Population

Figure 4.4.3.1 shows the coverage map of ETV which is calculated from each station's ERP by means of the field strength curve of F.C.C.
Table 4.4.3.1 shows population covered by each station and ratio for total population. After the completion of 1st plan stations' construction, the population covered will be 84% and 94% after 2nd plan stations.
Figure 4.4.3.3 shows the accumulated curve of covered population by each station (1st plan and 2nd plan stations).

Figure 4.4.3.2 shows TV network in Paraguay

Figure 4.4.3.1 Covering Map of ETV

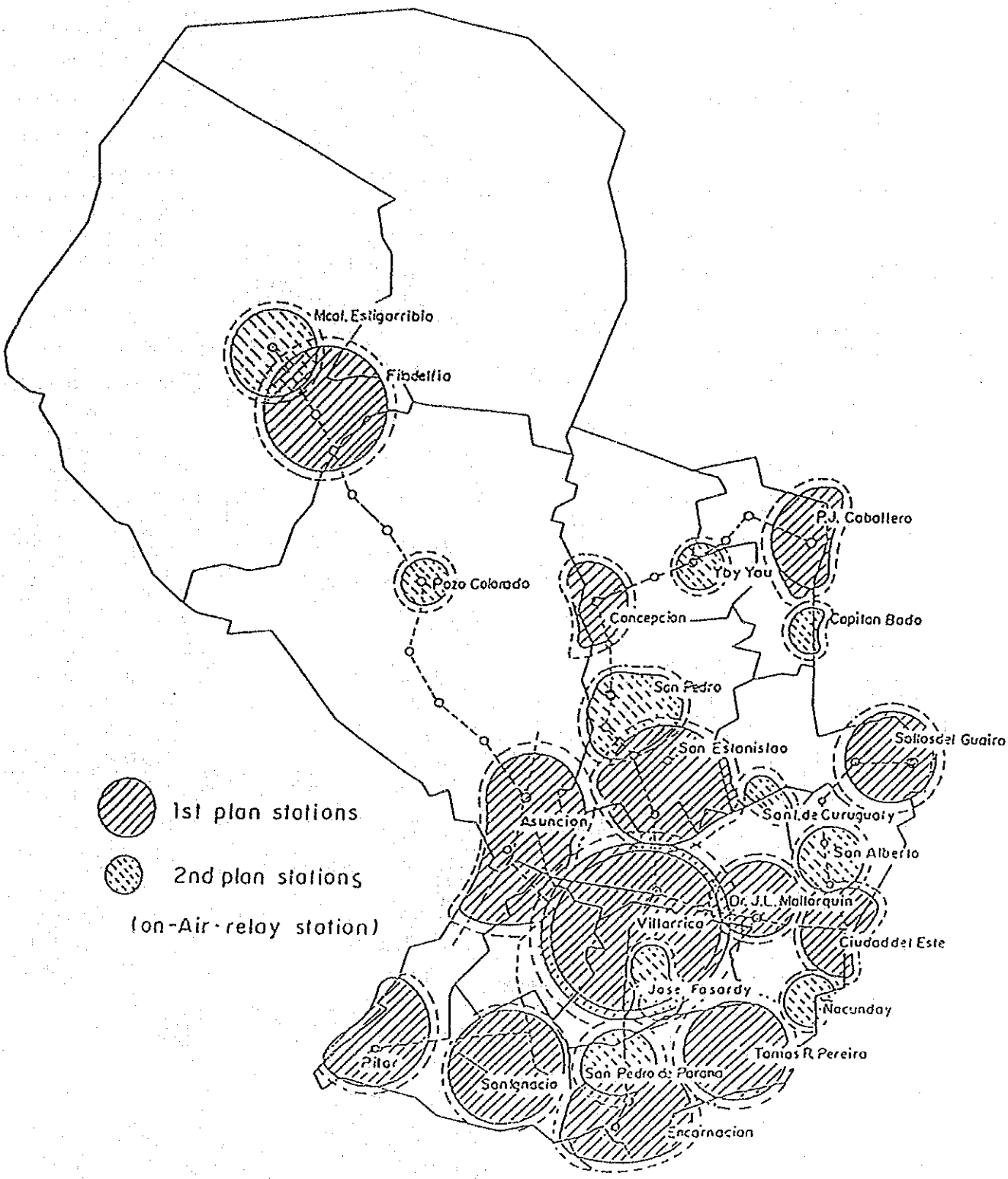


Figure 4.4.3.2 TV Network in Paraguay

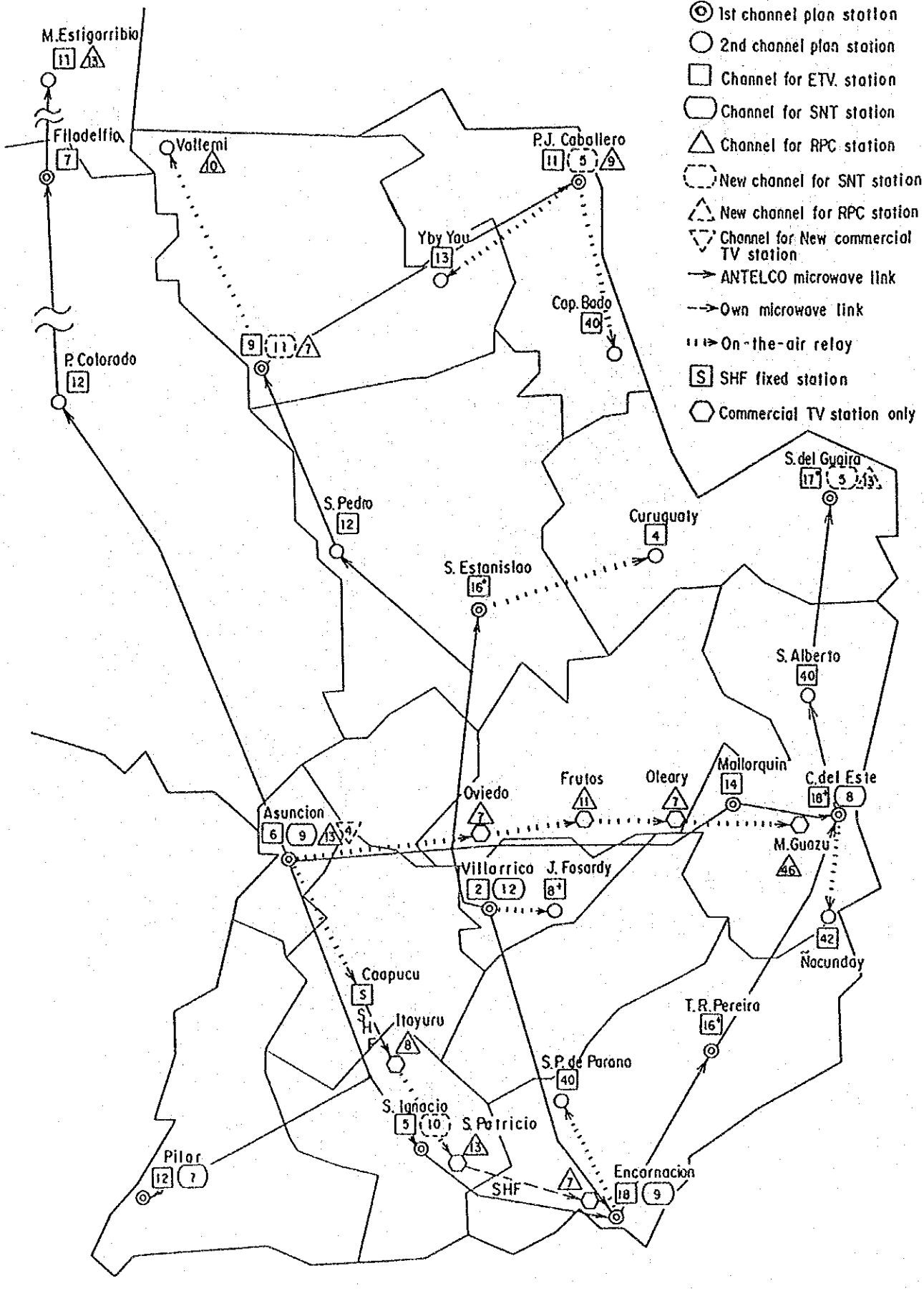
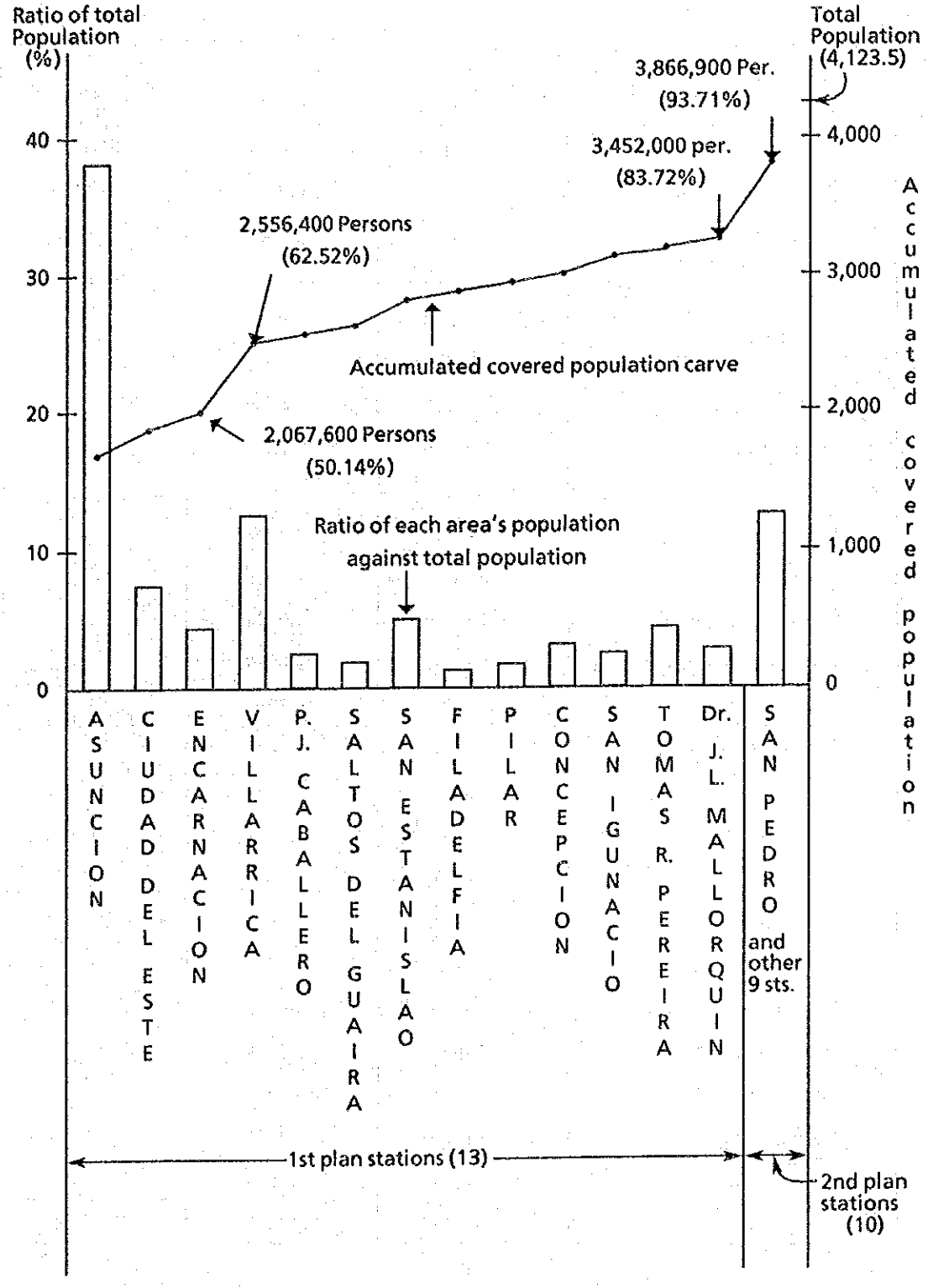


Figure 4.4.3.3 Accumulated Covered Population Curve



[Total pop. : 4.123.500 per.]

Table 4.4.3.1 Population Covered by Each Station (1st and 2nd Plans)

Total population ; 4,123,500

Station		Covered population	ratio	Accumulated ratio
1st Plan Sts	Asuncion	1,592,000	38.61%	38.61%
	Ciudad del Este	281,600	6.83%	45.44%
	Encarnacion	194,000	4.7%	50.14%
	Villarrica	488,800	11.85%	62.0%
	P. J. Caballero	76,700	1.86%	
	Saltos del Guaira	57,500	1.39%	
	San Estanislao	225,300	5.46%	
	Filadelfia	29,000	0.70%	
	Pilar	43,600	1.06%	
	Concepcion	137,900	3.34%	
	San Ignacio	80,600	1.95%	
	Tomas R. Pereira	162,500	3.94%	
	Dr. J. L. Mallorquin	82,500	2.00%	
	Subtotal	3,452,000	83.72%	83.72%
2nd Plan Sts	San Pedro de Parana	71,800	1.74%	
	Ñacunday	30,900	0.75%	
	San Alberto	54,700	1.33%	
	Jose Fasardy	72,500	1.76%	
	San Pedro	86,300	2.09%	
	San I. de Curuguaty	33,500	0.81%	
	Yby Yau	20,000	0.49%	
	Capitan Bado	13,300	0.32%	
	Pozo Colorado	17,900	0.43%	
	Mcal. Estigarribia	11,000	0.27%	
	Subtotal	411,900	9.99%	
Total		3,863,900	93.71%	93.71%

CHAPTER 5 FACILITIES PLANS

5.1 Site for the Educational TV Center (Asuncion)

5.1.1 Proposed Sites

It was judged that combining television studios with the transmitting station in one location would be an optimum solution. Taking this into account, the following four candidate sites were selected and investigated.

Site-1 - Adjacent to the new IPT in Luque

Site-2 - Within the premises of the National Sports Council, part of which is on the campus of the ISE

Site-3 - On the campus of the Felicidad Gonzalez primary school, close to the central bus terminal of Asuncion

Site-4 - On the campus of CRE in San Lorenzo

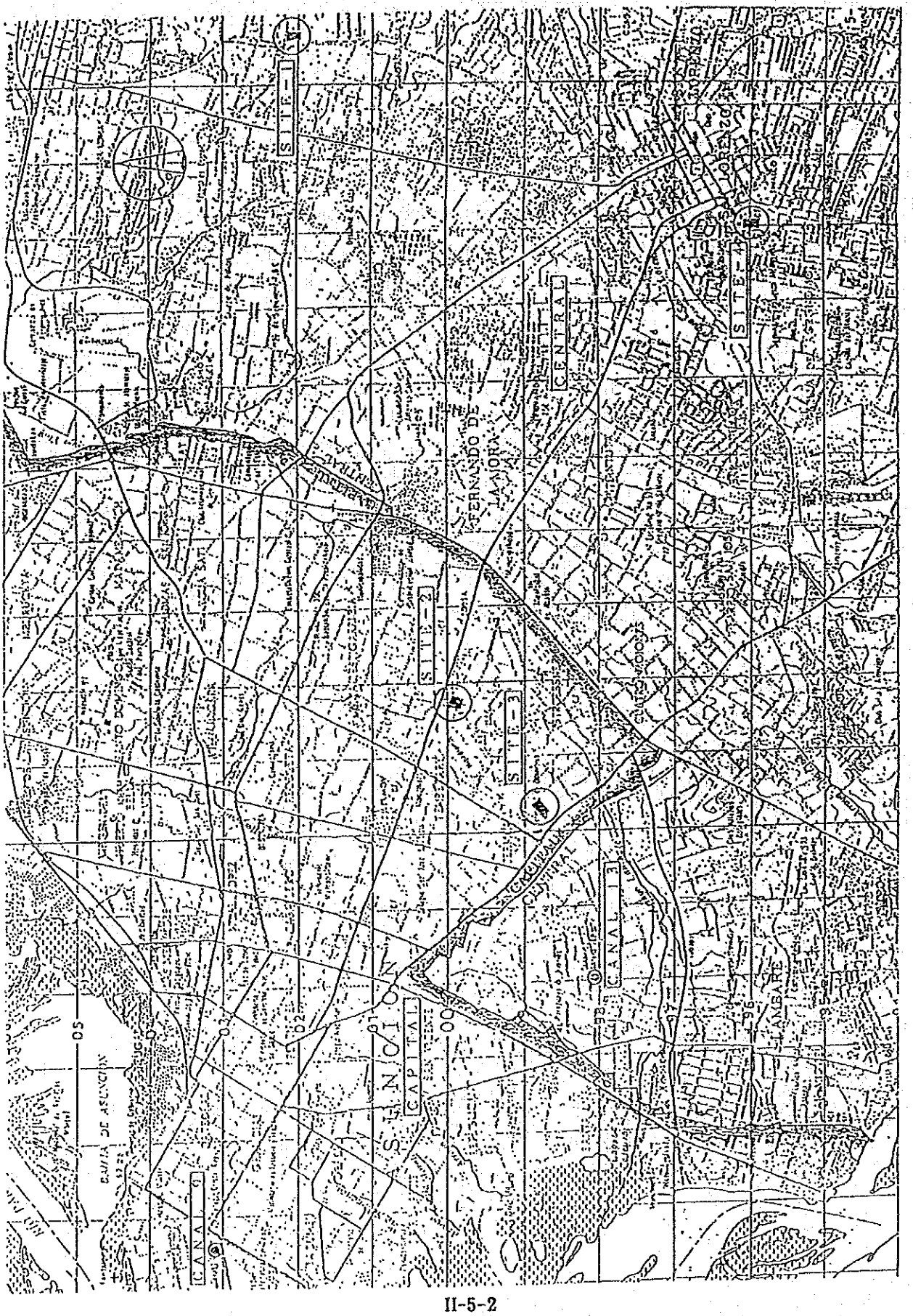
Comparing the four sites listed in Table 5.1.1.1, it can be seen that Sites 3 and 4 are smaller and the conditions less favorable than Sites 1 and 2.

Table 5.1.1.1 Comparison Table on Location of Sites Selected

Site No.	Site	Distance from center of Asuncion	Area	Narrowest section of the site	Height above sea level
Site-1	Luque (IPT)	22.5 km	5.25 ha	210 m	120 m
Site-2	Asuncion (ISE)	2.1 km	2.1 ha	140 m	150 m
Site-3	Asuncion	0.9 km	0.9 ha	63 m	135 m
Site-4	San Lorenzo	18.5 km	1.7 ha	100 m	140 m

Site-3 and Site-4 were thus eliminated from consideration, and investigated was focused on Site-1 and Site-2.

Figure 5.1.1.1 Map of Sites for TV Station



5.1.2 Selection of Optimal Site

(1) From the Viewpoint of Site Relocation

1) Transportation Access

There will be many persons, including government staff responsible for broadcasting and education, who will regularly commute to the ETV Center, so convenient access to transportation must be ensured.

a) Site-1: Luque IPT

Although there has been significant recent housing growth in this eastern residential, the rate of development has been slower than in the San Lorenzo area. There is presently no major road accessing this district in the urban plan of Asuncion City.

b) Site-2: ISE

This site is located in the center of Asuncion near the bus terminal. As the development of the city has been spreading from the old central city toward the southeast, growth in the San Lorenzo area has been remarkable. In the urban development plan, the principal belt freeway of Asuncion, Defensores del Chaco, is planned to be converted into a wide multi-lane freeway with a center belt, making traffic access to the site even more convenient.

2) A Suitable Site for a National Facilities

The planned ETV center will be a major institution for national culture and education, so a suitable site must be selected.

a) Site-1: Luque IPT

This location is rather distant from the center of the city, so is not appropriate for a cultural and educational center.

b) Site-2: ISE

Site-2 is located in the center of the capital on the campus of the ISE close to the MEC and other government agencies. It would thus be very appropriate as a center of sociology, economics and culture where intellectuals and talented individuals from various fields could gather.

3) Comparison of Locations in the Short-term

In the scenario for the development of educational TV given in this Master Plan, the first five years will be crucial in creating the necessary organizational structure, recruiting and training the needed personnel, training and instructing teachers, formulating programming and testing and verifying programs. The convenience of the location of the site must be considered in order to be able to effectively accomplish all these tasks in a relatively limited amount of time.

a) Site-1: Luque IPT

A survey of the location reveals that it is a rapidly developing residential district where residences are being built for people moving into this area from the provinces. Extrapolating the current trends, the population density is predicted to increases rapidly in the near future, but it is extremely difficult to forecast when and to what extent this growth will occur.

It is possible to envision that this area will develop into a residential district for commuters into the central city, but it is believed that it will take at least ten years to provide the schools, hospitals, stores and infrastructure which are indispensable for an urban residential district.

The completed IPT is nearby, and furthermore, the area to the south already has several large manufacturing firms, so, depending on the available labor force in the area, there is the possibility that the district will develop into an industrial region.

However, such a pattern of local development is found throughout Asuncion, so it is not certain that this specific area will be able to be rapidly urbanized within five years.

Thus, although the area around the IPT undoubtedly has the potential for development, it does not seem likely that there will be any significant changes in the near future.

b) Site-2: ISE

The main road network in Asunicon is composed of three spokes extending from the central district to the southeast and a belt highway connecting the spokes. One of the three spoke roads passes in front of the city hall and continues onto Luque. Another one passes in front of the ISE heading for to San Lorenzo. The third one heads due south to Villa Elisa. City officials have indicated that the latter two roads are scheduled to be widened. It is believed that once this widening is completed, the traffic congestion in the area will be considerably alleviated.

From the above considerations, the ISE site will continue to undergo development in the near future. Despite the present increases in traffic volume, it can continue to be viewed as an extremely convenient location.

(2) Operational Comparison

1) Assuring a Role as Liaison with Educational Organizations

In addition to finding a location presenting no problems for the function of a broadcasting station, it is essential that the site also be able to function as a liaison with educational institutions and organizations by providing educational services.

a) Site 1: Luque IPT

The Luque IPT site is extremely far from educational institutions and organizations. For instance, it would take a representative of an educational organization in central Asuncion, such as the Ministry of Teleducation or the MEC, almost an entire day simply to attend a conference held in Luque.

b) Site 2: ISE

There is currently an educational institution for teacher training at the ISE site. Thus, the site would be convenient for using ISE's lecture halls and classrooms in producing programs on a regular basis, as well as for providing training on how to use TV programs in the classroom.

2) Comparison of the Environment for Producing Television Programs

There are countless tools and equipment that must be secured in order to produce television programs. Thus, it is likely that there will often be times in the program production process when it will be necessary to purchase parts in a hurry. A site convenient for such a purpose is indispensable.

a) Site 1: Luque IPT

It would be very inconvenient to have to rush to Asuncion by car to get tools or instruments.

b) Site 2: ISE

As a business district is located nearby, whenever necessary it would be possible to purchase needed items smoothly.

(3) Technological Survey

The findings of the investigative sub-committee in the "Technical Committee for Site Selection" are shown in Table 5.1.2.1 on the next page.

Table 5.1.2.1 Comparison Table of the Proposed Sites

	Item	I.S.E. (Site-2)	I.P.T. (Luque) (Site-1)
(1)	Altitude of the transmission site and average difference in height between the surrounding area within a radius of 3~15 km (This is termed the altitude advantage of the transmission site)	Altitude Advantage: 33 m	Altitude Advantage: 5 m
		Refer to supporting Report	
(2)	Conversion of the above altitude advantage to transmitting power (Assuming a reference height as 160 meter high)	1.45 time as much as the transmitting power	1.03 times as much as the transmitting power; (Approximately 1, so as to get the same coverage area such as the ISE, the transmitter power should provide 1.45 times as power.)
(3)	Required antenna tower height (with the condition of achieving the same range as the existing commercial TV station)	160 m	Approximately 200 meters (= 160 + 30 ~ 50m *1) *1 30m=Altitude of ISE (150m) - Altitude of IPT (100 ~ 120m)
(4)	Depth to bedrock at the antenna tower site and the bearing power of soil	4 ~ 6 m 30 ~ 40 t/m^2	6 ~ 7 m 20 t/m^2
(5)	Social infrastructure	Faces onto a major throughfare; sewerage and water supply are already available	Sewerage & water supply are not available. Thus, it would be necessary to provide well water and clean water tanks.
(6)	Construction costs (Including antenna towers, buildings, and the above infrastructure)	1.0	1.5

	Item	I.S.E. (Site-2)	I.P.T. (Luque) (Site-1)
(7)	Size and shape of the property	Size: 2 ha (20,000 m^2); Narrowest section: 120m; This factor must be considered with regard to the layout of the antenna towers. There is sufficient space for enlargement of the buildings so there should be no problem in this area.	Size: 5.25 ha (52.500 m^2). Narrowest section; 180 m^2, a lot of freedom in layout.
(8)	Interference of the TV antenna towers with flight routes (Falling under special items related to ICAO range restriction.	The distance from the center of the runways to the antenna towers is 10.5 km. The necessary antenna tower height (160m) will exceed of 55m against restricted maximum height of 105 m. Permission for modifications would need to be obtained from the Minister of Transport.	The distance from the runways to the antenna towers is very close at 6.7 km. The necessary antenna tower height (200m) would exceed of 140m against restricted maximum height of 60m. Permission for modifications would need to be obtained from the Minister of Transport.
		Normal ICAO height restrictions are shown in Figure 5.1.2.1. The excess antenna tower height which would necessitate special permission , refer to the Figure 5.1.2.2.	
(9)	Direction of Receiving antenna to TV station	It would be desirable for the receiving antenna to face in the same direction as the existing station. There is not much effect from directional adjustment of the receiving antenna for people in north or south direction.	Since Luque is 16.7 km from SNT (Ch-9), this would have considerable impact. Specifically, people in the north or south would need to add an additional antenna. (See Figure 5.1.1.1)

Figure 5.1.2.1 Obstacle Limitation surface by ICAO regulation

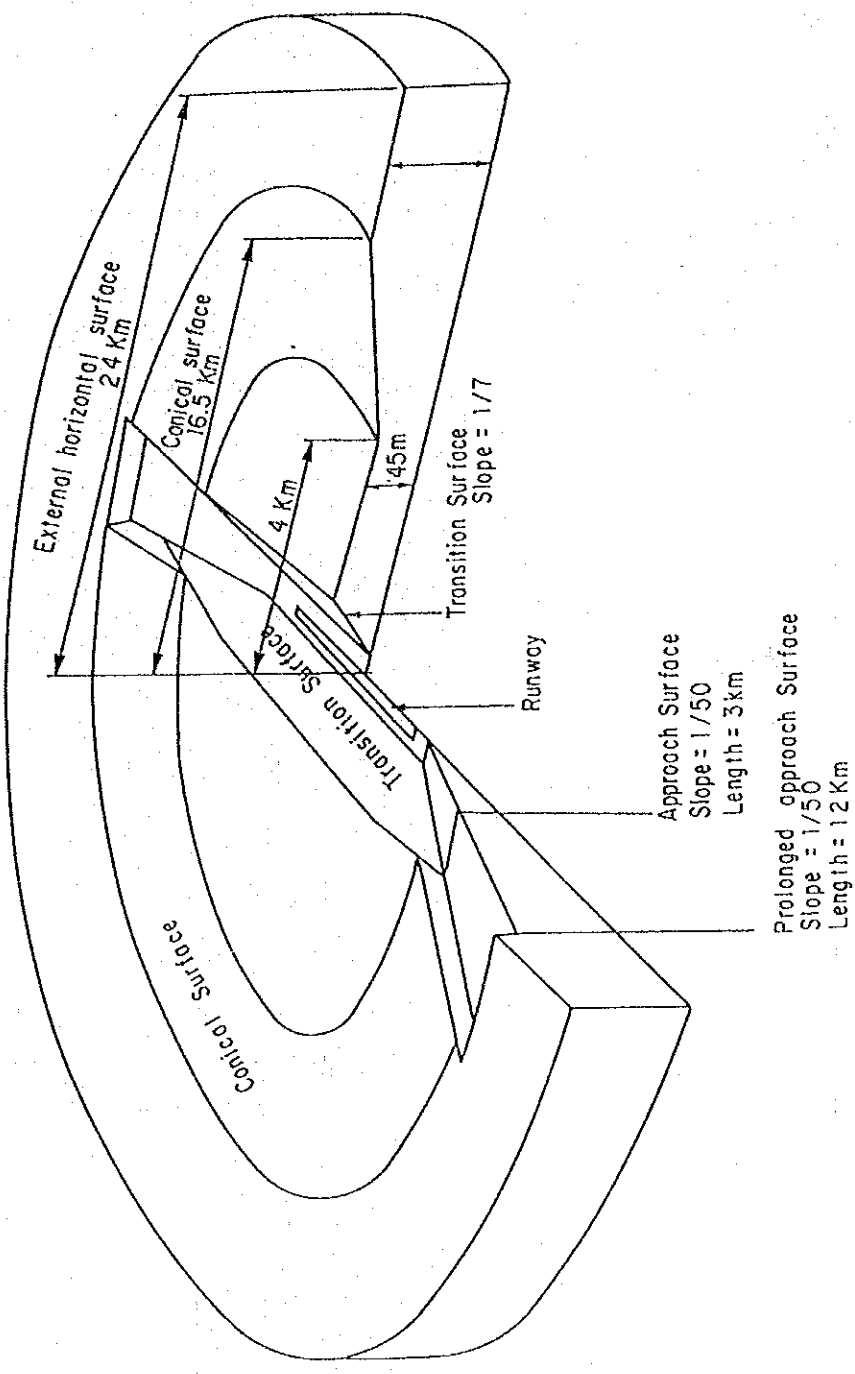
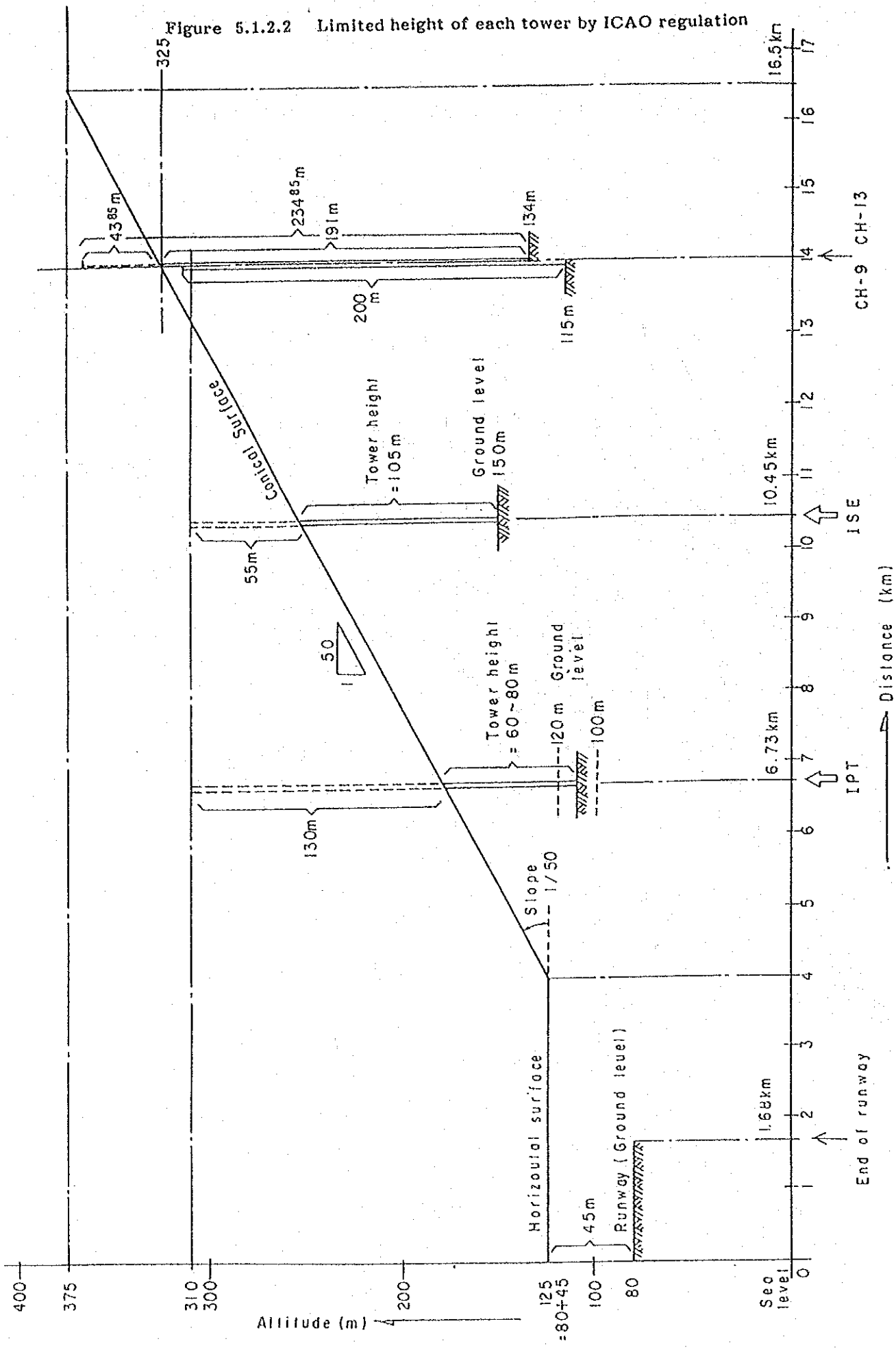


Figure 5.1.2.2 Limited height of each tower by ICAO regulation



(4) Final Recommendation

The investigative sub-committee composed of the MEC, the ANTELCO and the JICA Study Team concluded that the ISE site, which could provide the same coverage area as the two commercial television stations already located nearby, would be more suitable than the IPT site. Thus, the ISE site was selected.

5.2 Building Construction Plan

5.2.1 Basic Construction Policy of ETV Center (Asuncion)

(1) Planning Concept

The ETV Center in Asuncion will be a milestone as the birth place of educational broadcasting in Paraguay as well as the central facilities for program production and focus of administration and management. Also, it is the key station in the nationwide broadcast network, and the pivotal point in the nationwide educational TV broadcasting plan.

Asuncion transmitting station shall be constructed at the same place as the ETV Center because of the convenience of maintaining management, these shall be planned together as broadcast center. The ETV Center will have complex functions. It will be a place where many people such as the authorities, performers, visitors etc. come in and go out. It will be a symbolic building of educational television broadcasting in this country. Therefore, it should be emphasized that a sufficient functional consideration shall be given to as a center of the metropolitan area as well as the surrounding environment, so that it shall be a facility which many people will become familiar with.

Recent progress of broadcasting technology is remarkable, and it appears that the changes will continue in the future. In order to respond to the trends, a broadcasting station building should be designed with flexibility so as to accommodate those expected changes both in hardware and software. The internal design of the building should be carried out in consideration of easy handling of future repairs, extensions and other remodeling to be made to the building. In this Master Plan, a conceptual design of the ETV Center building with adequate size and scale, without any excess or shortage in practice, has been made in consideration of the existing conditions found in Paraguay.

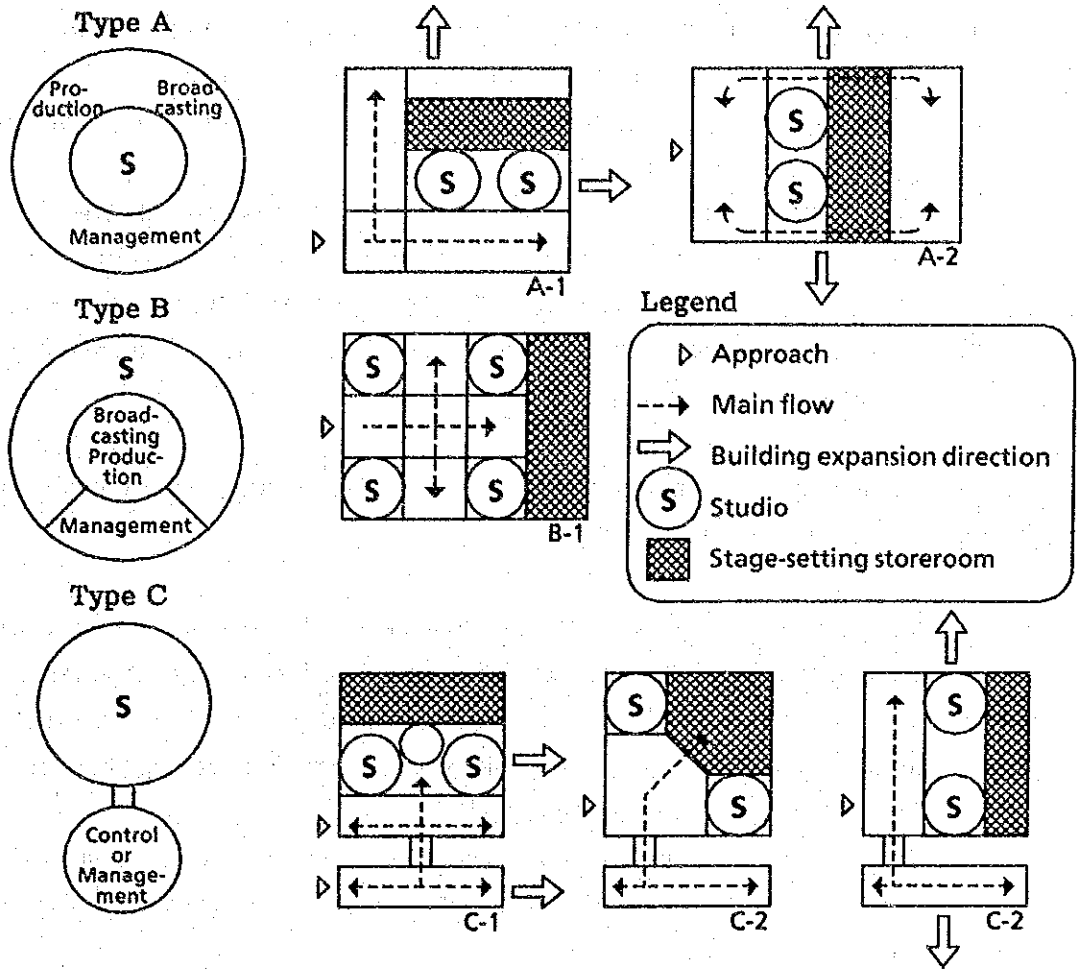
In order to fulfill the function as a central facility both in name and realty of the educational television station, the ETV Center needs to have the main functional blocks as shown in Table 5.2.1.1.

Table 5.2.1.1 Functional Blocks of Broadcast Center

Functional block	Detail of Division	Main Room
Administration	Management, General Affairs, Accountant, Business	Office Room, Conference Room, Canteen etc.
Production	Program Production, Composition of Program	Studio, Stage-setting store-room, Post Production Room, Editing Room, Tape Custody Room
Technical	Studio Technology, Transmission Technology, Construction Facility	Control Room, Maintenance Room, Transmitter Room, Air-conditioning Equipment Room, Elec. Room etc.

Since the ETV Center must have a complex construction with several different types of functions, it must be divided into several groups according to the functional purpose and scale. It must be built as the whole structure with each functional block. The main arrangements of functional blocks in the broadcast center are shown in the Figure of 5.2.1.1.

Figure 5.2.1.1 Block Pattern of Broadcast Center



For the ETV Center in this Master Plan, the points that must be considered to judge which block pattern is suitable are as follows;

1) Suitability of the site and configuration
2) Effective use of the building site
3) Clear traffic routes inside and outside building
4) Advantages for maintenance, management and administration
5) External view matching the surrounding environment
6) Securing space for future expansion of the building

The scale of the ETV Center differs greatly by broadcast time, content of program and ratio of program production. The building construction plan should be formed taking the plans for programing as well as plans for studio facility.

In executing the floor plan, the important points are as follows:

1) A spatial arrangement to enable high quality program production
2) Comfortable environment for the people working there
3) Appropriately arranged each room with neither over nor less provisions.
4) Easy understandable line of flow for people, things and vehicles
5) Easy daily maintenance, and economical operation and management
6) Future expansion and/or remodeling to cope with future requirements
7) Sufficient consideration of specialities of weather, climate and surrounding environment

The basic policies of making up the ETV center building in Asuncion in a practical way are as follows:

1) To construct as an educational TV broadcasting center together with transmitting station that covers the metropolitan area of Asuncion.
2) The scale of the building shall have necessary and minimum function as a central facilities of the national education broadcasting station for the first time in Paraguay.
3) Two rooms of minimum 270m^2 class medium size television studios and one room of 50m^2 sound studio shall be provided for the continuous program production.
4) In addition to the studios, a master control room, two editing rooms, two post-production rooms, as well as various rooms related to program production plus administrative offices, and a transmitting equipment room will be necessary.
5) Total floor area shall be approximately 4,500m^2.
6) A cyclorama, grid piping, gas, water plumbing etc. for producing educational program shall be installed in the medium size television studios and also in the continuity studio.
7) Transmitter room, and generator room shall be located in a building separate from the studio building.
8) With regard to the location of builidng, consideration shall be given to smooth movement of people, vehicles, and materials. Main building, the engine generator building, antenna tower, parking lot, and access roads on station grounds shall be reasonably arranged.

9) A site shall be set aside with consideration for future anticipated studio and office space expansion.

10) In order to avoid a considerable amount of hindrance during construction, building shall not be place close to either the antenna tower, or the guy wire.

11) Adequate consideration shall be given to the surrounding environment that they are appropriate for those of the educational institute (ISE, National physical education school) including interior and exterior spatial layout, exterior design. The design should be appropriate for the central facilities of a national educational TV broadcasting center.

12) Air-conditioning equipment shall be installed for the studio, control room, rooms concerned with technical aspects, performer's rooms, and administrative offices. System shall be set up so that it may be operated as economically as possible.

13) since there is a tendency for traffic to increase on main streets in the center of the city, adequate consideration shall be given to environmental noise.

14) In order that educational television may become an important media in the educational strategy of Paraguay, it is essential that the facilities be a place where teachers and students can feel comfortable. Consideration should be given for visiting observers to the center.

15) The distinction between structured and unstructured areas shall be clearly determined, and allowance shall be made for the future changes in both hardware and software.

(2) Floor Plan

With regard to the block pattern of the building, according to the basic policy shown in the previous section considering the special feature for the ETV Center, block pattern C-1 on Figure 5.2.1.1 is thought to be the most suitable for the following reasons.

1) In order to minimize the impact on the surrounding facilities, the position of the guyed antenna tower must be determined appropriately.
2) According to the position of the tower of 1), it is better for us to secure the space for future expansion of building at the rear side of the building against the front road.
3) It is desirable to locate studio blocks at a location as far as possible from the main street in order to avoid noise.
4) Since the volume of administration division increases, it should enhance people's life style and decrease cross interference by having the building separate from other buildings.
5) A courtyard shall be accommodated, so that it may be used for outdoor shooting of TV viewers participation programs etc.

In order to satisfy the function as a broadcasting center, various rooms as shown in the Table 5.2.1.2 are needed.

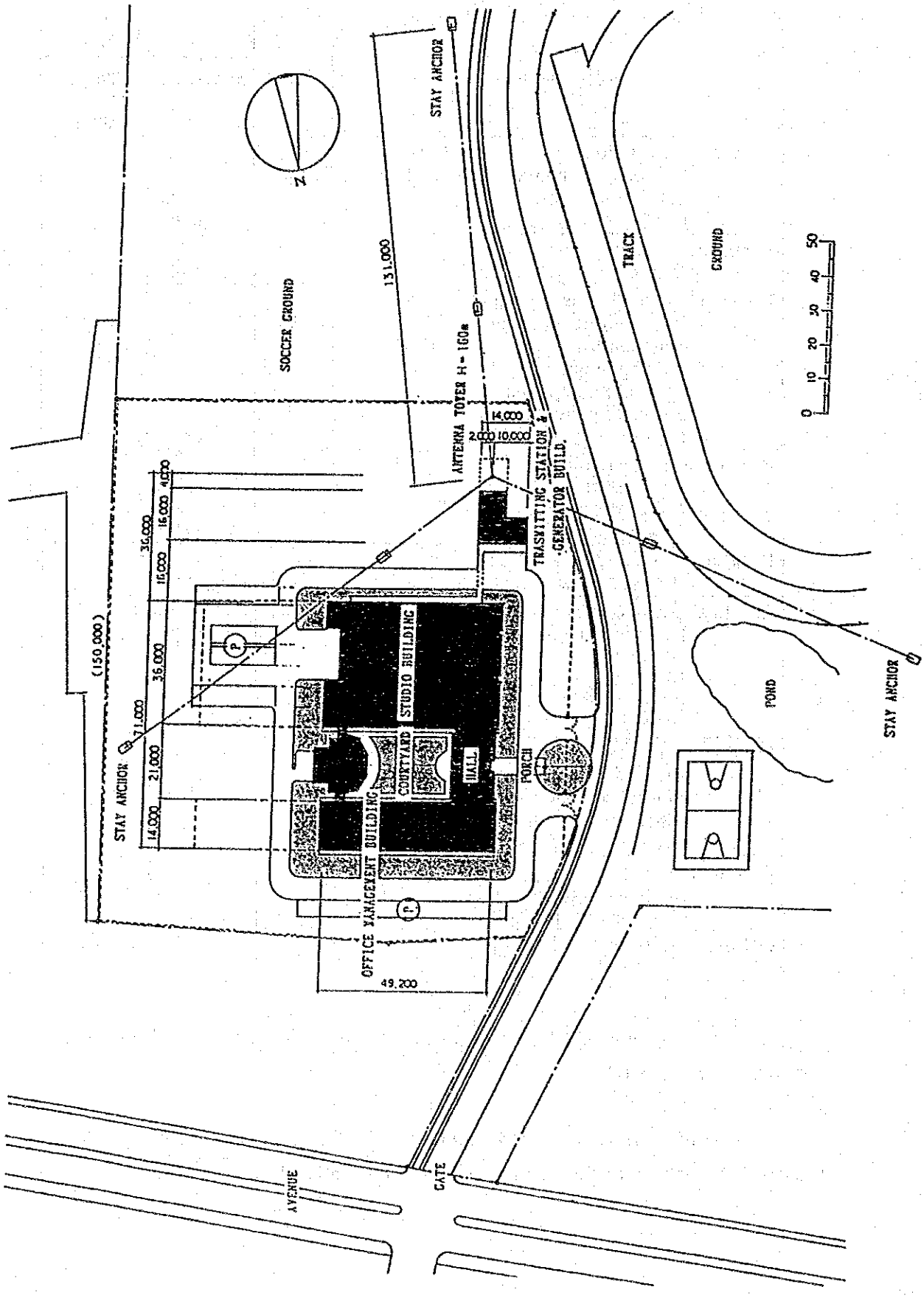
Table 5.2.1.2 Necessary Room List

Room Name			Area	Floor area	
				Sub-total	Total
				(m^2)	(m^2)
Studio:	TV studio	: 2 rooms	540		
	Sub-control room	: 2 rooms	140		
	Scenery storage				
	Others			1,050	
Performer:	Make-up room				
	Others			150	
Program production & editing:					
	Post production room		100		
	Sound studio	: 1 room	50		
	Editing room				
	Tape storage room				
	Material room				
	Others			345	
Broadcasting technology:					
	Main control room				
	Transmission room ($90m^2$)				
	Others			350	
Relays:	Relay preparation room				
	OB Van garage (with outdoor roof)			70	
Administration & office space:					
	Director's room				
	Office room				
	Dining room				
	Kitchen				
	Others			1,160	
Building facilities:					
	Air-conditioning machine room				
	Electricity room				
	Elec. power room ($35m^2$)				
	Others			290	
Common Space:					4.500 ($125m^2$ in Separate building)
	Entrance hall				
	Corridor, stairs, toilet etc.			1,085	
Others:	Drivers waiting room				
	Guard room			50	

The arrangement of the necessary rooms based on the C-1 block pattern is shown in Figure 5.2.1.1.

The block plan of the ETV Center is made based on the result of the consideration mentioned above and shown in Figure 5.2.1.2.

Figure 5.2.1.2 Block Plan of Broadcasting Center



(3) Cross-sectional Plan

The ETV Center will be a combined structure with a variety of room size. In particular, the television studios will occupy the largest space. In the television studio proposed in this plan, taking the camera backing into consideration, the height of the cyclorama needs to be 6.5 meters. Since at least a 1.5 meter space for lightning is required between the top of the cyclorama and the grid piping, and in addition, a two-meter space is needed for people to be able to stand and walk around between the grid piping and the ceiling, the distance from floor to ceiling must be at least 10 meters. Further, since ventilation ducts will be installed above the ceiling, an additional space of around 1.5 meters is required, so there must be a minimum space of 1.5 meters. If the building is constructed as a one-story structure, the studio will stick up, so the overall structure will be averaged to two-story height, aiming to shorten internal and external traffic line. The first-floor shall be a minimum of 50 cm above the surrounding land in order to prepare for flooding during the rainy season.

(4) Exterior Design Plan

Educational television broadcasts must of course become a widely accepted and familiar media among the people of Paraguay. In particular, it is important that students, who will become leaders of the nation of Paraguay in the future, and other young people become familiar with and utilize the facilities. For that reason, in addition to the software aspects of the facilities, including program content and method of use, the roles that the broadcasting center building has are crucial. The building exterior is valuable as a visual symbol of the intended operations. This is the reason that the exterior of the broadcasting center should have a design that is modern and simple and at the same time strong and cheerful. The method of construction and building materials should be those that are commonly used in Paraguay, and attentions should be given to the surrounding environment.

(5) Structural Plan

Television studios, stage setting storeroom, and other large rooms will be mixed in with editing rooms, make-up rooms, and other relatively small rooms. It is essential that the shape of the main structure and construction methods be kept as simple as possible so that building plans do not become complex both horizontally and in cross-section. The structural elements such as pillars, girders, and walls should be arranged according to clear rules. This is not only beneficial for plan execution, but can also be said to give a great deal of flexibility to the future. As for the construction method, the method used in Paraguay for medium to high level construction of laying bricks against a rigid frame, built from reinforced concrete pillar, girders and slabs, to form a composite wall, will be employed. For the roof, in particular the studio portion of the roof, roofing slabs made reinforced concrete, are desirable since they guarantee a high degree of sound insulation.

The ETV Center requires a capability in the area of disaster prevention that surpasses general construction standards. Thus in construction, it is essential that a higher grade structure than is common for medium to high level structures in general for the city of Asuncion be attained.

(6) Equipment Plan

The proposed site is in the business district of Asuncion, so, that there is no problem with providing infrastructure. Regarding water supply, except for measures to provide sound and vibration insulation against the noise from pumps and water supply pipes for noise-sensitive rooms such as studios, there is little difference from general construction. Water supply pipes are installed in the television studios as necessitated by the production of educational programs. In addition, it is necessary to install a water tank on the roof at least 10 meters above ground level, which should be included in the building design.

Regarding electrical equipment, transformers are needed for a system to supply electrical power for television equipment, television lighting, construction, regular lighting, electric sockets, etc. Uninterrupted power supplies, emergency generators, storage batteries, etc. should also be included. In addition to the electrical ground contacts, grounding points are needed for the broadcasting equipment.

In the ETV Center, maintenance of the internal environment of the building for employees, performers and observers is of course a requirement. Furthermore, control of the temperature and humidity in the video tape storage room is needed. In order to maintain ideal conditions in the broadcasting equipment rooms, the entire building will be equipped with air conditioning system, with the exception of a few of the hallways, stairs, rest rooms, and warehouses. The air conditioning system for the broadcasting equipment room will be centrally controlled, but it will be necessary that consideration be given to setting up a system so that the time and purpose of use can be assigned in each studio. In the administrative office block, a split type heat pump model would be desirable, and adequate ventilation equipment should be installed for the rest rooms, kitchenettes, shower rooms, equipment rooms, and storage areas.

Because the ETV Center needs a building with high quality safeguard against disasters, plans should be made for preventions of fires by using fire-resistant materials in construction. In addition, equipment such as fire extinguishers, fire alarms, and guide lamps should be installed in the individual rooms.

(7) Transmitting Facilities

The transmitting equipment room shall be in a separate building from the main broadcasting center, and accommodated in a single building with a generator room, which shall be built next to the main mast of the antenna tower. The antenna tower is a guy wired type. Maximum care needs to be taken that the guy wires do not interfere with the ISE grounds, nor with the space for the national physical education school. In designing the strength of the tower, it should be made to withstand a maximum wind velocity of 50 m/sec.

5.2.2 Construction Plans for Regional Transmitter

(1) 1st Plan Stations (13 stations)

The 1st Plan's transmitting stations are total of thirteen (13) stations. In order to minimize the investment costs to a minimum and also the operational expenses shall be kept as low as possible by utilizing current ANTELCO's

transmission facilities together with the operating staff. Nine (9) of these stations can share existing ANTELCO facilities (steel support towers, transmission equipment rooms, and stations building space). For the remaining four (4) stations (including Asuncion) it will be necessary to locate a site solely for the educational television use, and to construct new antenna towers there. Excluding Asuncion, the following three types of station buildings are planned.

Table 5.2.2.1 The 1st Plan, ETV Station's Building Dimensions

Type	Station Name	Planned Dimensions
A	Cudad del Este, Encarnacion Villarrica	16m × 8m = 128 m^2
B	San Estenislao, San Ignacio	12m × 6m = 72 m^2
C	P.J. Caballero, S. del Guaira Pilar, Filadelfia, Concepcion Tomas R. Peveira, J.L. Mallorgnin	8.5m × 6m = 51 m^2

Each of the above station buildings will be basically one-story brick structures. The roofs will be composed of locally made tiles on a wooden framework, but these will be planned so as to harmonize with the surrounding environment, in particular for the cases adjoining the ANTELCO facilities. For cases where a antenna tower will be erected independently for educational television broadcasts on a new site (in addition to Asuncion, Cap. Milanda, San Estanisiao, San Ignacio), it is necessary to secure adequate property for economic type tower (guy wired).

(2) 2nd Plan Stations (10 stations) and Local Studio Facilities Plans

The main buildings of these stations will be for the purpose of relay broadcast, so minimum space would be the best. At this stage in order to be able to produce programs at the local level, TV studios will be built in principal outlying cities of Ciudad Del Este and Encarnacion. Ciudad Del Este TV station is planned to co-site with the ANTELCO Station, but there is no space for building of the studio later. The transmitting station covering Encarnacion is also planned at the Captain Milanda ANTELCO site that is located 16 km from the city of Encarnacion. It will be necessary for the both stations to have the studios in the center of the cities.

5.3 Studio Facilities Plan

5.3.1 Basic Policies for Planning of Studio Facilities

Studio facility plan in the Full-scale Operation Phase shall be formulated in accordance with the Programming Plan stated in Chapter 3 of PART II. The basic policies on the studio facility plan are as follows.

- Taking into account of the current broadcasting technological system and level in Paraualy, the system should be similar system and/or equipment which are now being used in the current commercial TV stations.

- The studio system should be designed, to be able to obtain spare-parts and repairing easily.

- For easy operation and maintenance, the studio equipment should be obtained them same maker with same model as far as possible.

5.3.2 Studio Facilities Plan

(1) TV Studio and Sub-control Rooms

The ETV Center has two televisjon studios for the production of ETV's own programs. Each studio will produce two or more educational and cultural programs every day. One of the studio will also produce daily a one-hour live program. In planning, emphasis are placed on the following points;

(a) For ease of operation and maintenance, and flexibility of studio allocation, same types of equipment are to be employed for each studio including 3 units of television cameras each.

(b) The production equipment are designed to produce complete packaged programs without using the post-production facilities.

(c) Sufficient studio floor space to allow arrangement of two sets of sceneries/settings for successive program production.

(d) Sub-control room to be located on the same floor with the studios for easy access by the technical and program staff.

(e) Studio lighting equipment to employ "batten system" for easier daily operation and future production requirement

(f) Expandability according to the future programing needs.

(2) Sound Studio

ETV Center shall be equipped with one sound studio to produce necessary sound materials for TV program production.

(3) Post Production Room

In order to produce a complete packaged program from video materials recorded outside and stocked materials, following processings are necessary; editing of VTR tapes, insertion of caption titles on the beginning and ending of the program, insertion of narration and effect sounds, dubbing of sounds and other post-production work.

For that purposes, at ETV Center, 2 sets of post production room are planed which are equipped with VTRs, TV monitors, VTR editing devices, video switchers, special video effect devices and C.G (Computer Graphic) equipment.

(4) Editing Room (2 Rooms)

There should be 2 editing rooms equipped with VTRs, monitors and editing device so that outdoor recorded tapes and archives tapes may be edited simply and inserted in the studios.

(5) Television Master Control Room

Master Control Room transmits according to the timetable the packaged programs played back with the VTRs and the live programs produced at the studios or the outside venues. Operating as the center of technical activities, the Master Control equipment must be in operation on a real-time basis with

very high stability. The equipment must also be easily handled and maintained efficiently by a limited number of technical staff.

(a) Play back VTRs for transmission of repeated packaged VTR programs which is characteristic to educational television service.

(b) Equipment required for receiving, transmission and recording, of the OB programs, the programs sent via ANTELCO lines and the international programs, including a TV standards converter.

(c) A continuity studio facilities for insertion of program titles and other data for live programs. This small studio will have one set of television camera for broadcasting news or public announcements and for emergency proposes.

(6) Outdoor Broadcasting Van (OB Van)

One TV OB Van shall be provided in order to relay broadcast of actual teaching in school class room, and broadcasts of sporting events of football games which are popular in Paraguay, broadcasts of concerts and traditional shows by famous artists. The TV OB Van shall be equipped with 3 TV cameras, 2 VTRs and 2 sets of FPU (Field Pick-up Unit).

(7) Video Location

Combined Camera-VTRs shall be arranged for new gathering, shooting of out door sceneries, theatrical events and other educational programs outside of the station.

(8) Type and Make of Equipment

(a) Television Camera

The three-CCD (Charge Coupled Device) type color television camera of simple construction should be employed in view of its easier operation, maintenance and higher stability. Same type of the cameras supplied by one manufacturer should be used for studio, OB and video location

purposes. Different types of accessories can be fitted to the cameras for the varying purposes.

(b) VTR

The 1/2 inch component type VTR, which has proven performance record, should be adopted for all the purposes of program production, post-production and transmission.

(c) Video Switcher, Audio Mixer and other Equipment

For the reason of easy and economical operation and maintenance, the video switchers, audio mixers, audio tape recorder-players, video and audio monitors for the television studios, post-production rooms, master control room, OB van and other facilities must be the same types and of same make respectively as far as possible.

(9) VCR Tape Copying Equipment

In order to promote the application of educational television service in remote areas, particularly to schools, the programs will be distributed by means of VCR tapes, and the schools are provided with the VCR s and television receivers. For the purpose of producing VCR cassette tapes, a tape copying equipment is included in the ETV Center facilities.

(10) Television Studio Facilities in Local Station

In the Integrated Phase, two major regional stations at Ciudad del Este and Encarnacion will be provided with each one television studio. Each station will be equipped with a small-size studio facilities, video location equipment, editing and master control equipment.

5.4 Transmitting Facilities Plan

5.4.1 Basic Policies of Transmitting Facilities

Based on the data and information collected during the course of site survey, the basic policies for the television transmitting facilities are formulated as follows.

(1) Utilization of Existing ANTELCO Facilities

In order to reduce construction cost, possibility of utilization of existing ANTELCO facilities should be taken into account as far as possible. The strength of antenna tower, possible interference of microwave and television transmitting equipment and other relevant matters should be examined carefully.

A number of advantages as follows are expected by employing this method;

(a) Share use of site, building, antenna tower and power lines

(b) No STL facilities between ANTELCO and TV station when same site is used.

(c) ANTELCO's technical manpower is available

(2) Type of Equipment

For efficient and effective operation and maintenance, use of full solid-state transmitting equipment is strongly recommended.

(3) Operating System

The operational reliability of full solid-state television transmitters of latest model is very high without needs for daily adjustment or maintenance and the equipment failure rate is expected to be extremely low. Besides, as the broadcasting is mainly educational purposes, the program transmission may be

interrupted when equipment failure occurs. Therefore, the transmitting system can be composed of single transmitter without a spare system.

(4) Maintenance

For easy and economical operation and maintenance, television transmitting equipment with interchangeable units/modules of same type from same manufacturer should be employed all through the broadcasting network.

(5) Antenna Tower

In case new transmitting site is required, the type of antenna tower mast be of a guy-wired mast, because relatively spacious site can easily be available in Paraguay and its construction cost is lower than that of the self-supporting type.

5.4.2 1st Plan Stations (13 Stations)

According to the Broadcasting Network Plan, stations to be constructed are as follows. And transmitting facilities for each station are shown in the Table 5.4.2.1.

Name of station	Transmitting conditions	Name of station	Transmitting conditions
① Asuncion	Ch-6 10kW 160m Ant.	⑧ Pilar	Ch-12 4kW Exist. Tower
② Ciudad del Este	Ch-18^{+} 10kW Exist. Tower	⑨ Filadelfia	Ch-7 5kW Exist. Tower
③ Encarnacion	Ch-18^{-} 10kW Exist. Tower	⑩ San Ignacio	Ch-5 5kW Exist. Tower
④ Villarrica	Ch-2 10kW Exist. Tower	⑪ Concepcion	Ch-9 5kW Exist. Tower
⑤ P.J. Caballero	Ch-11 1kW Exist. Tower	⑫ T.R. Pereira	Ch-16 5kW Exist. Tower
⑥ S. del Guaira	Ch-17 5kW Exist. Tower	⑬ J.L. Mallorquin	Ch-14 5kW Exist. Tower
⑦ San Estauislao	Ch-16 5kW Exist. Tower		

5.4.3 2nd Plan Stations (10 Stations)

2nd plan stations are as follows:

Name of station	Tower height	Name of station	Tower height
① San Pedro de Parana	New. 80m	⑥ San I.de Curuguaty	New. 70m
② Ñacunday	New. 60m	⑦ Yby Yau	Existing. 103m
③ San Alberto	Existing. 110m	⑧ Cap. Bado	Existing. 53m
④ Jose Fasardy	New. 60m	⑨ Pozo Colorado	Existing. 105m
⑤ San Pedro	Existing. 102m	⑩ Mcal. Estigarribia	Existing. 41m

All of the above stations should be of 250W~1KW transmitter with UHF or VHF, and new TX house also should be constructed beside the foundation of the antenna towers shown above.

Table 5.4.2.1 1st Channel Plan Station's Transmitting Facilities

Station name (City name)		Asuncion	Ciudad de Este	Encarnacion (Cap. Miranda)	Villarrica	P.J. Caballero	S. del Guaira	San Estanislao	Pilar	Filadelfia	San Ignacio	Concepcion	Tomas R. Pereira	J. L. Mallorquin
		First channel plan station (Key transmitting station)												
Location Latitude (Degrees) Longitude (Degrees)		25° 19' 08" 57° 34' 58"	25° 30' 36" 54° 38' 14"	27° 11' 36" 55° 46' 09"	25° 43' 38" 56° 20' 35"	22° 32' 55° 44'	24° 09' 25" 54° 40' 21"	24° 30' 32" 56° 24' 45"	26° 50' 30" 58° 17' 27"	22° 21' 31" 60° 02' 07"	26° 51' 15" 57° 02' 06"	23° 24' 33" 57° 26' 72"	Tomas R.Pereira ANTELCO relay station	Guyrangua ANTELCO relay station
Altitude above the sea level		165 m	220 m	276 m	291 m	650 m	360 m	250 m	57 m	139 m	176 m	70 m	350 m	250 m
Transmission channel		CH-6*	CH-18*	CH-18*	CH-2	CH-11	CH-17*	CH-16*	CH-12	CH-7	CH-5	CH-9	CH-16*	CH-14*
Transmitter output power		10 kw	10 kw	10 kw	10 kw	1 kw	5 kw	5 kw	4 kw	5 kw	5 kw	5 kw	5 kw	5 kw
Transmitting antenna constitution	Face	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D
	Type	2D 2D 2D 2D	4D 4D 4D 4D	4D 4D 4D 4D	2D 2D 2D 2D	2D – 2D 2D	4D 4D 4D 4D	4D 4D 4D 4D	4D 4D 4D 4D	4D 4D 4D 4D	4D 4D 4D 4D	4D 4D 4D 4D	4D 4D 4D 4D	4D 4D 4D 4D
	Stage	6 6 6 2	3 1 3 3	3 3 1 3	4 2 4 4	3 – 3 3	2 2 2 2	4 4 4 4	1 1 1 1	3 3 3 3	1 1 1 1	1 1 1 1	2 2 2 2	2 2 2 2
	Power Ratio	3 (A–C) 1	1 1 1 1	1 1 1 1	1 1 1 1	1 – 1 1	1 1 1 1	1 1 1 1	2 (A–C) 1	1 1 1 1	1 1 1 1	1 1 1 0	1 1 1 1	1 1 1 1
Center height of transmitting antenna (Above the sea level)		312 m	314 m	384 m	436 m	743 m	456 m	625 m	143.5 m	239 m	274.5 m	150.5 m	440 m	350 m
Main feeder	Type & Length	77D 177 m	77D 120 m	77D 115 m	77D 165 m	39D 115 m	39D 120 m	39D 100 m	39D 110 m	39D 120 m	39D 120 m	39D 100 m	39D 110 m	39D 120 m
Tower		New guyed wire tower should be installed (160 m high)	Existing ANTELCO's self-supporting tower should be common used (93 m high)	New guyed wire tower should be installed (116 m high)	New guyed wire tower should be installed (150 m high)	Existing ANTELCO's self-supporting tower should be used common (104 m high)	Existing ANTELCO's self-supporting tower should be used common (100 m high)	New guyed wire tower should be installed (80 m high)	Existing ANTELCO's self-supporting tower should be used common (117 m high)	Existing ANTELCO's self-supporting tower should be used common (105 m high)	New guyed wire tower should be installed (100 m high)	Existing ANTELCO's self-supporting tower should be used common (93 m high)	Existing ANTELCO's self-supporting tower should be used common (102 m high)	Existing ANTELCO's self-supporting tower should be used common (83 m high)
Program transmission		—	By ANTELCO's transmision line	By ANTELCO's microwave link. Branch point is Cap. Miranda relay station.	By ANTELCO's transmision line	By ANTELCO's micro wave link	By ANTELCO's micro wave link	By ANTELCO's micro wave link. Branch pont is Itacurbi de Rosario relay station	By ANTELCO's microwave link	By ANTELCO's microwave link	By ANTELCO's microwave link	By ANTELCO's microwave link	By ANTELCO's microwave link	By ANTELCO's microwave link
STL or microwave link.		Studio →ANTELCO ANTELCO →Studio	ANTELCO →Studio* Studio →ANTELCO*	Cap. Miranda relay station ANTELCO →Studio* Studio →Cap. Mirande ANTELCO*	Cnel. Oviedo ANTELCO →TV transmitting station	—	—	Itacurubi del Rosario ANTELCO →TV transmitting station (Own micro-wave link)	—	—	—	—	—	—
Enginer generator		200KVA	*100KVA	*100KVA	—	—	—	—	—	—	—	—	—	—
Transmitter house		Brick house Floor space: 11 m × 8 m	Brick built-house Floor space: 16 m × 8 m	Brick house Floor space: 16 m × 8 m	Brick house Floor space: 16 m × 8 m	Brick house Floor space: 8.5 m × 6 m	Brick house Floor space: 8.5 m × 6 m	Brick house Floor space: 12 m × 6 m	Brick house Floor space: 8.5 m × 6 m	Brick house Floor space: 8.5 m × 6 m	Brick house Floor space: 12 m × 6 m	Brick house Floor space: 8.5 m × 6 m	Brick house Floor space: 8.5 m × 6 m	Brick house Floor space: 8.5 m × 6 m
Power receiving		Aerial Power Cable should be wired 300 meters in length, from final pole to new transmitter house.	Power Cable should be buried 40 meters in length from final pole to new transmitter house.	Power Cable should be buried 50 meters in length, from final pole to new transmitter house.	Open wire, 800 meters in length should be installed.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.	Power Cable is to be buried 50 meters in length from final pole to new transmitter house.
Access road		Existing	Existing	Existing	New construction	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing
Population inside of the coverage area		1,590,000 Persons	282,000 Persons	194,000 Persons	489,000 Persons	77,000 Persons	58,000 Persons	181,000 Persons	44,000 Persons	40,000 Persons	81,000 Persons	137,900 Persons	162,500 persons	69,500 persons

* STLs and generator are to be installed in the full scale Phase II.

CHAPTER 6 PROGRAM TRANSMISSION PLAN

6.1 Basic Principle for Program Transmission planning

(1) Basic Requirement for the Planning

With regard to the transmission of programs, programs should be able to be successively transmitted to local stations through the broadcast network. In addition, in the future, local programs also transmitted to Asuncion.

The program transmission plan should be formulated to coordinate with the broadcast network plan described in Chapter 4 of PART II.

6.2 Present Status of TV Transmission Network

The ANTELCO is now carrying out a ten-year plan to modify the nation-wide microwave network. A digital transmission network with a speed of 140 Mb/sec has been built from Asuncion through Encarnacion to Ciudad del Este, and it will be put into service for telephone as well as for TV use in March of 1993. In addition, digitalization of the circuits between Ciudad del Este and Salto del Guaira is scheduled for completion in 1994, and of the circuits from Asuncion to M'cal Estegaribia is scheduled to be completed in 1999. Further progress is being planned in the digitalization connecting other districts, which is expected to be completed in the year 2002.

In Paraguay, because the TV circuits use the stand-by telephone circuits, their fare can be lower than the standard international fee.

6.3 Program Transmission Plan to Main Broadcast Stations

For the planning of this educational Television broadcasting network, use of the ANTELCO digital terrestrial microwave network is much realistic and economical, because there is a concrete development plan of the ANTELCO's digital network which may enables multiplex television signal transmission at fairly lower cost. Therefore, usage of the ANTELCO digital network shall be the basic policy for the transmission of the proposed television broadcasting network.

(1) Encarnacion, Ciudad del Este and Villarrica

Based on the new digital circuit connecting these cities, that will be put into service in March 1993, with the use of the world standard digital coding scheme of 34Mb/sec or 45Mb/sec, multiplex television signal transmission for the ETV to share the spare circuit with the commercial television stations will be possible.

(2) M'cal. Estigarribia and Salto del Guaira

Since there is a digital circuit plan scheduled to complete by 1999, it is possible to transmit educational television signal by utilizing the spare circuit commonly with commercial television station(s).

(3) Concepcion and P. J. Caballero

In the long-term plan of the ANTELCO, since there is a plan of digitalization of the circuit planned (140 Mb/sec) by the year 2002, it can transmit educational television signal in the same manner as above.

(4) Pillar

Digital circuit with the speed of 140Mb/sec will set up to Ita Yuru by the year 2002. Furthermore, it is planned to set up a digital circuit from Ita Yuru to Pillar, therefore, educational TV signal can be transmitted by the use of the spare circuit.

(5) San Estanislao and San Ignacio

The educational television programs are transmitted to San Estanislao via the STL from a relay station called Itacurubi del Rosario which is a intermediate station of a digital circuit from Asuncion to Concepcion. Similarly, programs are transmitted to San Ignacio station utilizing STL from the relay station of Sta Rosa which is on the main digital circuit to Encarnacion from Asuncion.

(6) Pereira

Programs are directly obtained at Pereira, because this station is on the digital circuit from Asuncion to Encarnacion and to Ciudad del Este.

(7) J. L. Mallorquin Station

Since there is an optical digital circuit planned by the year 2002 between Asuncion → Cnel, Obiedo → Ciudad del Este, program transmission is made from the relay station of Guyraungua to the new Mallorquin Station with an STL circuit.

6.4 Requirements for Transmission of ETV Signals

Regarding the present status of the ANTELCO's network, following items are requested in order to match with the educational Television network plan in the future.

① Adoption of Television signal codes world standard specification of 34Mb/sec or 45Mb/sec.

② Digitalized circuit between (Asuncion → Pilar), (Asuncion → M'cal., Estigarribia), (Asuncion → Concepcion, P. J. Cabvallero) shall be completed by the 8th year of the development schedule of ETV.

In the Figure 6.4.1, present status and future digital network plan of ANTELCO TV transmissions are shown.

Figure 6.4.1 Map of Micro-wave Network for TV

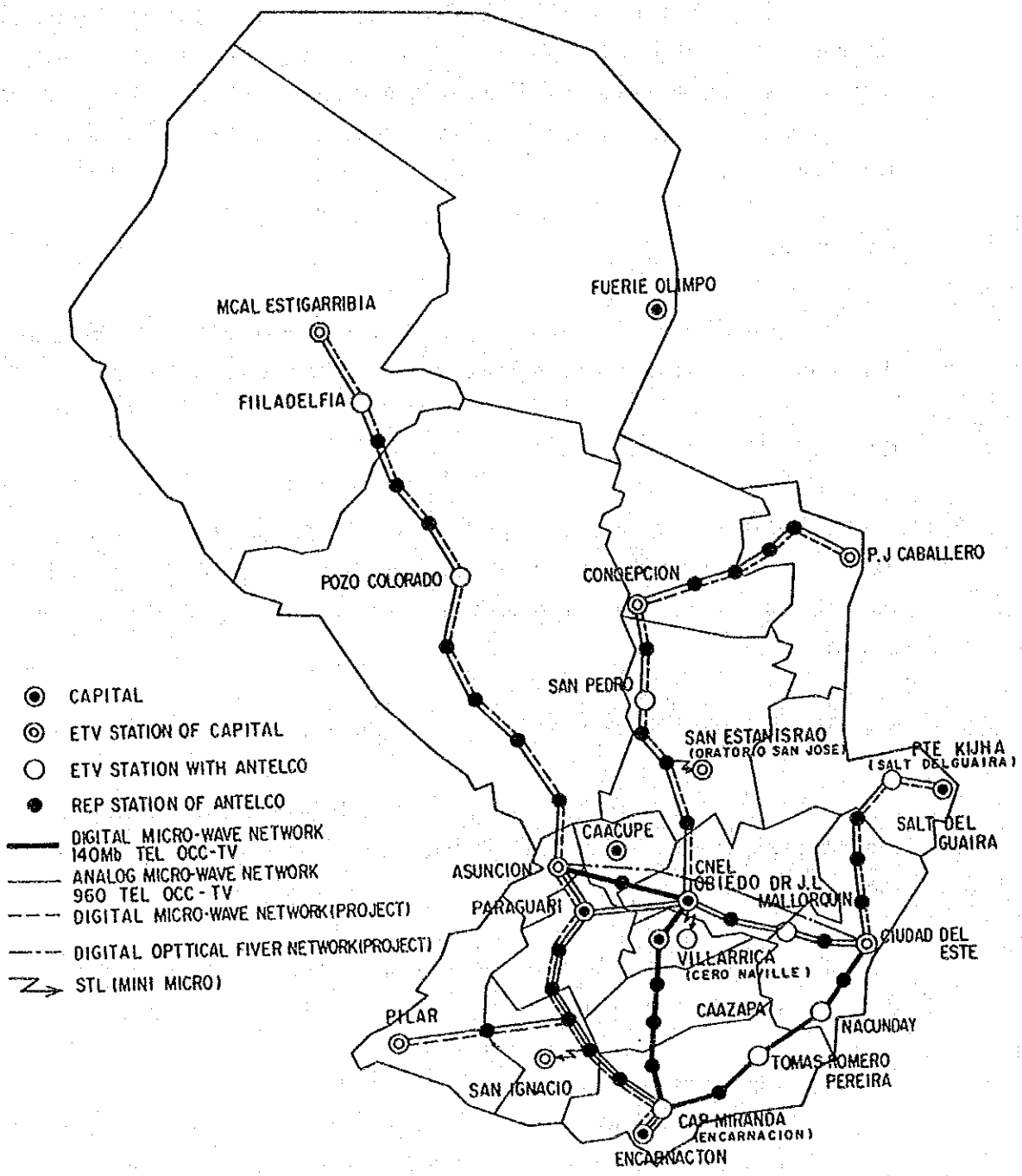
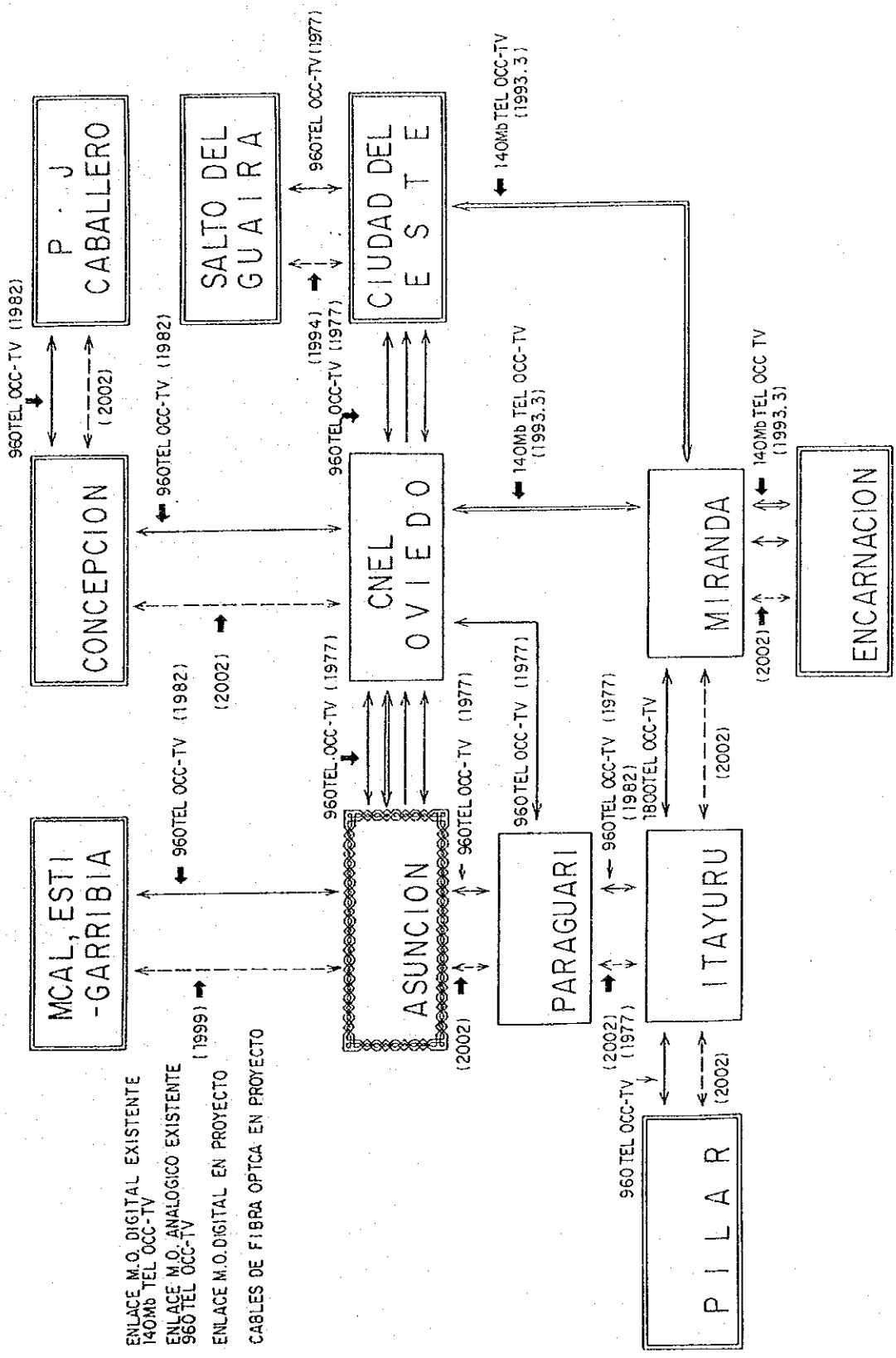


Figure 6.4.2 Circuit Diagram Micro-Wave Nettworke of ANTLECO for TV



CHAPTER 7 OPERATION AND MAINTENANCE PLANS

7.1 Operation Plan

7.1.1 Operation Plan for Preparatory Phase, Experimental Phase and Introduction Phase (1st~5th year)

(1) Preparatory Phase (1st year)

At present (1993), the Teleducacion Departmento of the MEC has one TV studio in Don Bosco in Asuncion, which was renovated in the early part of 1993. Although the studio's production equipment is rather superannuated it can produce educational programs experimentally with the production staff of the Teleducacion Department. As of April, 1993, the actual Producers are 3 and Technical staff members are 8 in the Teleducation Department.

In July 1993, a new IPT studio is completed at the Luque site in Asuncion, on this occasion the existing old IPT studio will be shifted to the new IPT site. Therefore, in the existing old IPT studio located near the MEC studio can be used by supplying necessary studio production equipment.

The preparatory Phase is the first year to produce the educational TV programs. The production span for each producer will be about 3 weeks (approximately 20 days), which includes producing, examining each program and also training the new production staff. As regard to the number of production in this year, with an additional 2 producers, totaling of 5 producers of the MEC, the possible number of programs in the year will be 50 (= 5 PDs × 200 days ÷ 20 days).

The necessary production staff will be composed of 5 producers and crew of studio production staff consisting of the following members:

Technical Director-Switcher (TD-SW)	1	8~9
Video Engineer (VE)	1	
Audio Mixer	1	
Lighting Director	1	
Cameramen	2~3	
Assistant Microphone Operator	1	
Lighting Assistant	1	

(2) Experimental Phase (2nd year)

At the end of this stage, the number of PDs will be increased by 7 to a total of 12. Because, this year is the second year the production span will be reduced to 10 days, so that the produced program number will be 240 programs per year (= 12 PDs × 200 days ÷ 10 days).

In order to shift smoothly to the next stage, which requires more production staff, additional personnel will have to be recruited and given on-the-job training.

In the second year, the produced programs shall be used on a trial basis in actual classroom settings such as the ISE until it is acknowledged to be qualified for distribution by the CATV to designated model schools in the Asuncion city area and even to remote towns like Amanby by VCR tape distribution.

For such purposes, a machine to dub the qualified programs to ordinary cassette VCR tapes is necessary to be provided in the tentative headquarters of ETV at Don Bosco in Asuncion. But the information coverage of CATV is limited to the city area, and will not reach the remote schools in which demand for educational TV service is most urgent.

In the third year, a practical TV transmitter will be provided in Asuncion together with a Studio to TV transmission Link (STL) from the tentative Master Control Room at the Don Bosco ETV Headquarters. The TV signal will thereby be able to reach the remote schools surrounding the Asuncion city.

Technical staff to operate the Master Control Room (MCR) are therefore required. The number of staff in the MCR at one shift will be three persons with two shifts a day, including TD and VTR operators. With the development of the broadcast programs, the staff will be increased to five persons per one shift in the Introduction Phase.

(3) Introduction Phase (3rd~5th year)

According to the Programing Plan, the objective of this phase is to promote the production capability and to accumulate the educational programs in order to enter smoothly into the succeeding practical phase. The number of the accumulated programs during this phase is planned to be at least 1,400. In order to realize this, the number of PDs will be increased to 20, each with a production span of 10 days in average. The two studios, MEC and the old IPT shall be used at full capacity each day.

Hence, the number of the produced programs a year will be ({ 20 PDs × 200 days/year × 2 studios } ÷ 10 days) = 800/year. Since there are 3 years in this phase the later 2 years (4th and 5th) are to be scheduled to produce the accumulated programs, the program number of 2 years production: 800 × 2 = 1,600 programs will more than that of the required 1,400 programs.

Among the production of the above programs, programs such as "News" and "Wide" programs at night, as well as outside programs transmitted via satellite (Iberoamerica etc.) shall also be tested in order to be prepared for the broadcasting operation in the next phase.

7.1.2 Operation Plan for the Full-scale Phase I (6th~8th year), II (9th~11th year) and Integrated Phase (12th year onward)

With the completion of an ETV Center at the ISE site and practical TV Broadcasting service at Asuncion, Ciudad del Este, Encarnacion (Cap. Miranda) and Villarrica areas, the ETV broadcasting from the ETV Center in Asuncion will be in full-scale operation and reach over 62% of the total population of the country.

1) Necessary Production and PDs

According to the Development Plan stated in Chapter 3, the yearly development plan and the necessary number of PDs are as shown in the Table 3.4.7 and Table 3.4.8.

The method of the calculation of the necessary number of programs to be produced and the required number of PDs is shown as below.

P = Necessary number of programs to be produced
PDs = Required number of Program Directors

P × 5 days ÷ 200 days = PDs

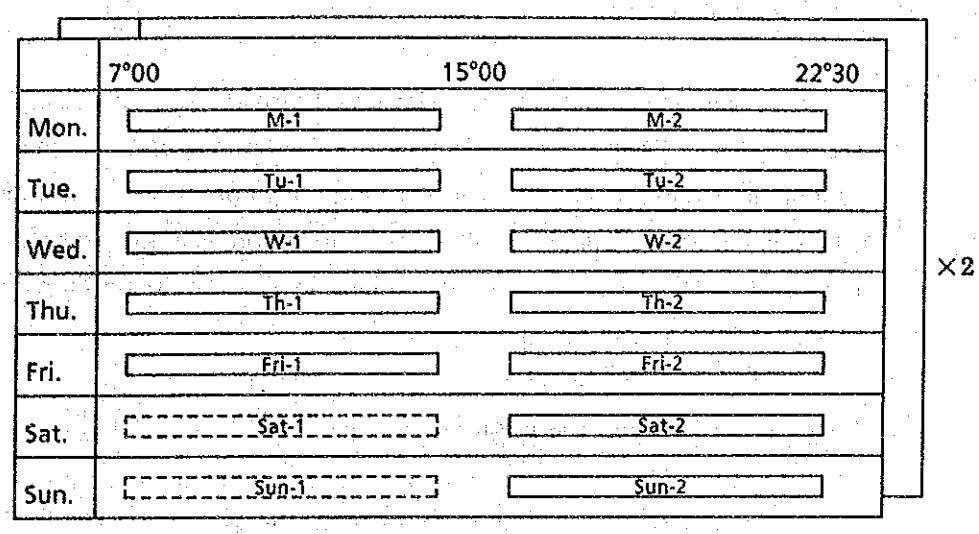
assuming that each PD's production span is an average of 5 days (1 week).

2) Necessary Resources and Supporting Technical Staff

(a) Studio Production and Required Staff

Since there are two TV studios in the ETV center, the maximum allocationable production is shown in below.

Weekly allocation of the two studios



Max No. of Productions = 2 prod./day × 7days × 50week × 2studio
= 1,400 productions/Year

Normally, in one production shift as described above, one program can be produced. In the case of series programs with the same actors and same situation, though, more than one program can be created in a single shift.

During the pre-phases, the production working shift will be limited to five weekdays (Mon.~Fri.) and 40 weeks a year, so that 800 (= 2 shifts × 40 weeks/ year × 2 studios) programs can be made. However, in the Introduction phase, News and Live-Wide programs on the seven days a week, including Saturday and Sunday operations, shall be executed.

The production staff crew will be composed of about 10 staff with two crews per five working days per week during the pre-phases.

There will be 20 studio production experts (≈ 10 persons/crew × 2 crews).

There are about 1000 required studio programs which shall be assigned according to the programming plan, mentioned in Chapter 3. Live programs will be assigned on Saturday each week for a total of 100 (2 programs/week × 50 weeks = 100) while the remaining 900 programs will be produced on the weekdays (2 programs × 5 days × 2 stations × 45 weeks).

The required studio production staff crews shall be assigned to the studios. The number of crews shall correspond to the 1,000 production; therefore, since the workable days per year of the crew is 200 days a year, 1,000 ÷ 200 days = 5 crews are necessary. This means that the total number of experts in the studio production will be about 5 × 10 = 50 persons.

(b) Post Production and the Required Staff

After entering the Full-scale phases, the plan calls for from 400 to 560 programs a year. This can be accomplished within the capacity of two post production rooms of 800 production (2 shift × 5days × 2P.P.R × 40 weeks) as shown below:

Weekly allocation of the 2 P.P. Rooms