5.11 Outline of Programme Production Equipment Plan (for reference only)

The following is the summary of the production equipment plan in the Later Three Year Plan.

1. Programming Plan

(1) ETV's programming policy

In accordance with the following policy, ETV will put more emphasis on general educational programmes. After the completion of the Later Three Year Plan, it plans to launch regular broadcasts for primary and middle schools.

1) Literacy education for adults (especially women and people in remote areas)
2) Proliferation of primary and middle school education
3) Dissemination of population control and welfare information
4) Transmission of programmes by AIOU (Allama Iqbal Open University)
5) Improvement of productivity for farmers and factory workers
6) Science education for university students
7) Improvement of public health and nourishment standard
8) Child care education

(2) Broadcasting hours

After the completion of this Project, ETV will broadcast 11 hours 20 minutes a day, including school broadcasts. Table-1 shows ETV's planned weekly on-air timetable.

1) School broadcasts

ETV will provide educational programmes for primary and middle schools (1st to 10th grades) in accordance with the curriculum set by the Ministry of Education and Provincial Education Departments. It will air 9 school programmes on weekdays (Sat. to Wed.) and seven programmes on Thursdays, with each programme lasting 20 minutes, half of a regular 40-minute class. At school, students will watch the programmes at the beginning of a class. The latter half of the class will be

dedicated to further explanations by teachers or question-and-answer sessions. To ensure students understand the contents fully, the same programmes are repeated the following day. Since the 20-minute programmes will be aired consecutively without interruption, for programmes aired in the latter half of 40-minute class units, schools may provide a teacher's session before showing the programme, shift the class 20-minute later, or videotape the programme and use it in regular order. The most effective method will be decided through trial and error in the trial broadcasting stage. Also, for the time being, each school will have only one television set to be shared among the students of all grades. Therefore each school will have to prepare a communal television viewing room in advance.

The curriculum terminology shown in Table-1 has yet to be finalized, being only a provisional idea.

Broadcasting hours and selections of teaching subjects will be decided by collaboration between the relevant government offices.

About 1,000 programmes will have to be prepared before full broadcasting begins.

2) Literacy class programmes

Improvement of the national literacy level is one of the Pakistan government's top priority policies. Through the initiative of the National Educational Training Committee (NETCOM), the "Literacy through Television" programme was inaugurated in February, 1994. This is a project jointly supported by the Ministry of Education, PTV, AIOU, relevant provincial offices, and regional NGOs. The project foresees the establishment of 300 Television Literacy Centres (TLCs) across the country, to aid in the improvement of the literacy rate. A 30-minute programme will be aired twice a day, six days a week, during the most convenient hours for mass viewing. Currently, the broadcast hours are to be set at 10:30 and 18:30.

3) Women's hour

Between 16:00 and 16:30 is considered the best broadcast time for female viewers, as it is in between daytime household/agricultural work and preparation for evening meals. During this time slot, ETV will air programmes on family planning, health, hygiene, and child care.

4) English language programmes

Between 16:30 and 17:00 is ideal for English language programmes for middle school students, who would just have returned home around this hour. English language study is important because the proportion of classes conducted in English increases at the middle school level and higher.

5) Vocational education programmes

These are programmes designed to help both young and adult viewers acquire vocational skills, such as welding, plumbing, fixing electronic equipment, repairing two- and four-wheel vehicles, and also the management of chicken farms. They will be broadcast between 17:00 and 17:30 for the convenience of the target viewers.

6) AIOU programmes

These are aimed at offering educational services to students in fringe regions or those who wish to acquire teaching qualifications at home. Two 30-minute programme produced by AIOU will be aired every day between 17:30 and 18:30. One of them will be a repeat for viewers' convenience.

7) General educational programmes

After 19:00, ETV will show programmes for family viewing, including high-quality educational programmes from overseas, dubbed in Urdu. Other selections are dramas, quiz shows, and documentaries, covering topics such as population, welfare, health, hygiene, the environment and pollution.

8) Friday broadcasts

Fridays will have special feature programmes, as well as repeats of popular shows or overseas programmes and live sports coverage via satellite.

Table-1 ETV Weekly On-air Timetable after the Completion of the Project

	Sat.	Sun.	Mon.	Tue.	Wed.	Thu.	Fri.
7:50	Quraan Reading and Translation					(Studio)	
8:00	1 Lang.	1 Lang. (R)	1 Mat.	1 Mat. (R)	1 Soc.	1 Soc. (R)	Holiday Programme
8:20	2 Lang.	2 Lang. (R)	2 Mat.	2 Mat. (R)	2 Soc.	2 Soc. (R)	
8:40	3 Lang.	3 Lang. (R)	3 Mat.	3 Mat. (R)	3 Soc.	3 Soc. (R)	
9:00	4 Lang.	4 Lang. (R)	4 Mat.	4 Mat. (R)	5 Lang.	5 Lang. (R)	
9:20	5 Mat.	5 Mat. (R)	6 Lang.	6 Lang. (R)	6 Mat.	6 Mat. (R)	
9:40	7 Lang.	7 Lang. (R)	7 Soc.	7 Soc. (R)	7 Sci.	7 Sci. (R)	
10:00	8 Lang.	8 Lang. (R)	8 Mat.	8 Mat. (R)	8 Sci.	8 Sci. (R)	
10:20	Filler						
10:30	Literacy Programme					(Studio)	
11:00	9 Lang.	9 Lang. (R)	9 Mat.	9 Mat. (R)	9 Sci.		
11:20	10 Lang.	10 Lang. (R)	10 Mat.	10 Mat. (R)	10 Sci.		
11:40							

Abbreviation

Lang. : Languages, Mat. : Mathematics,
Soc. : Social Affairs Sci. : Natural Science

The numbers on the left indicate the relevant grades.

16:00	Women's Hour	(Studio)	Holiday Programme
16:30	English Language Course (Imported)	(P.P.)	
17:00	Vocational Education	(Studio)	
17:30	AIOU Programme		
18:00	AIOU Programme		
18:30	Literacy Programme (Repeat)		Holiday Programme
19:00			
19:30	Imported Programmes	(P.P.)	
20:00	Drama on Population Problem & Welfare	(Studio)	
20:30	Quiz, Stage Show, Ethnic Music	(Studio)	
21:00	Health for Everyone	(EFP)	
21:30	Science & Technology, Environment & Pollution	(EFP)	
22:00	Economy & Business	(EFP)	
22:30	ETV Academy	(Studio)	
23:00	News in Arabic / Today's News	(Repeat of GTV)	
23:20	Quraan Reading and Translation	(Repeat)	
23:30			

Note : 1. From 8:00 to 10:20 and from 11:00 to 11:40 are school broadcast hours.

2. Holiday programmes are composed of special programmes and repeats of requested programmes.

(3) Programme productions at regional centres

Pakistan is made up of four provinces; Punjab, Sind, Baluchistan, and North-West Frontier Province. Production centres in each province produce their own programmes which are particularly useful for the people in their regions.

Being a multi-ethnic nation, Pakistan has many kinds of cultural heritage unique to each region. The production of local-oriented programmes helps heighten the cultural identities of ethnic groups. It also serves to nurture the sense of national unity by introducing regional cultures to the rest of the country.

Programmes of excellent quality can be produced efficiently by the participation of regional experts at their regional stations. For example, Islamabad has experts on population, agriculture, science, and AIDS. Experts in Karachi are well versed in industrial, environmental, business, economic, and marine transport areas. Lahore has experts on agriculture, education, and public hygiene; Peshawar on agriculture, health, public hygiene, and narcotics; and Quetta on agriculture and mining. Depending on the region, the same theme can be dealt with in a different light.

The following is the number of programmes each GTV regional station produced between July and September, 1994 (during 13 weeks).

Islamabad	194 programmes/4,602 mins	(2.2 programmes /51 mins per day)
Karachi	233 programmes/5,174 mins	(2.6 programmes /57 mins per day)
Lahore	294 programmes/6,695 mins	(3.2 programmes /74 mins per day)
Peshawar	103 programmes/2,345 mins	(1.1 programmes /26 mins per day)
Quetta	162 programmes/4,486 mins	(1.8 programmes /49 mins per day)

Other than these, regional stations produce local news programmes and contribute to national news.

(4) Existing equipment at regional centres

Table-2 lists the major existing equipment at each regional PTV centre. Each centre has improved its equipment since being opened. Some of the equipment items are relatively new, but most are about ten years old, with some having been in use for almost 20 years. Such old equipment, however, is generally well maintained and spare parts are systematically managed. The overall technical level appears very high.

Table-2 Production Equipment of Regional Stations for GTV Programmes

	Karachi (inaugurated in 1967)	Lahore (inaugurated in 1976)	Peshawar (inaugurated in 1985)	Quetta (inaugurated in 1984)
General Studio	A : 36m² 3 Cameras B : 207m² 3 Cameras D : 318m² 3 Cameras	A : 413m² 3 Cameras B : 216m² 3 Cameras D : 369m² 3 Cameras	A : 223m² 3 Cameras B : 119m² 2 Cameras	A : 223m² 3 Cameras B : 119m² 2 Cameras
News Studio	C : 60m² 1 Camera	C : 58m² 2 Cameras	C : 96m² 3 Cameras	C : 96m² 2 Cameras
OB-Van	No.1 Big 6 Cameras No.2 Small 3 Cameras	No.1 Big 6 Cameras No.2 Small 3 Cameras	No.1 Small 3 Cameras	No.1 Small 3 Cameras
VTR 1" 3/4" 1/2"	2 sets 8 sets 8 sets	3 sets 5 sets 6 sets	2 sets 5 sets 3 sets	2 sets 5 sets 4 sets
ENG/EFP Camera	9 sets	9 sets	8 sets	7 sets
Tape Editing Room	2 rooms	2 rooms	1 room	1 room
Master Control Room	1 room	1 room	1 room	1 room
Central Equipment Room	1 room	1 room	1 room	1 room

2. Study and Examination of Design Criteria

(1) Review of the quantity of production equipment

Table-3 shows the balance between the amount of production equipment and the ETV programming plan. It is a comparison between ETV's annual production volume and the production capacity of equipment provided in the Initial Two Year Plan and to be provided in the Later Three Year Plan.

At studios, 1,340 programmes need to be produced per annum, compared to the production capacity of 1,344, whereas EFP needs to produce 1,058 programmes per annum, compared to the capacity of 1,050. The figures indicate that the programming plan is achievable, making efficient use of the equipment. The calculation is based on the assumption that studios operate 48 weeks a year (the remaining 4 weeks will be spared for maintenance) and EFP operates 300 days a year (EFP's operating days are fewer because weather conditions sometimes prevent filming. Also the need for frequent equipment transport would require more repair work).

1) TV studio equipment

a) The size of studios

The standard size required for TV studios and their ancillary rooms are shown in Table-4.

Karachi ETV studio is designed to cover lectures, interviews, and programmes for cooking and scientific experiments. The total floor space is set at 150m² (effective area 120m²) so that it can be used for quiz shows, light dramas, and music programmes as well for the better presentation of educational themes. Lahore ETV studio can meet the same standards by converting the existing studio (effective area 200m²).

Table-3 The Balance of ETV Programme Production and Equipment After the Completion of the Project

This table examines the balance between the production equipment and the annual volume of programmes to be produced under the ETV weekly on-air timetable, shown in Table-1.

1. Number of Programmes to be Produced

Types of Programmes	Duration	Annual Production Volume		
(Studio Production)				
Additions for School broadcasts	20'	6 progs × 52w – 156 repeats	=	200 progs.
Women's Hour	30'	6 progs × 52w – 156 repeats	=	156 progs.
Vocational Education	30'	6 progs × 52w – 156 repeats	=	156 progs.
Literacy Programmes	30'	6 progs × 52w – 156 repeats	=	156 progs.
Dramas	30'	6 progs × 52w – 156 repeats	=	156 progs.
Quiz Shows	30'	6 progs × 52w – 156 repeats	=	156 progs.
ETV Feature Programme	30'	6 progs × 52w – 156 repeats	=	156 progs.
Quraan	10'	7 progs × 52w – 264 repeats	=	100 progs.
Holiday Special Programmes	60'	2 progs × 52w	=	104 progs.
		Studio Production Total	=	1,340 progs.
(EFP Production)				
Health for Everyone	30'	6 progs × 52w – 26 repeats	=	286 progs.
Science Technology /Environment & Pollution	30'	6 progs × 52w – 26 repeats	=	286 progs.
Economy and Business	30'	6 progs × 52w – 26 repeats	=	286 progs.
		EFP Production total	=	858 progs.
EFP also produces insertion scenes for 1,340 studio-produced programmes, that is, the equivalent of 200 EFP programmes, therefore		EFP Production Grand Total	=	1,058 progs.

2. Production Equipment and its Capacity

(Studio Capacity)			
Islamabad Studio A	1 prog/day × 7 days × 48w	=	336 progs.
Islamabad Studio B	1 prog/day × 7 days × 48w	=	336 progs.
Karachi Studio	1 prog/day × 7 days × 48w	=	336 progs.
Lahore Studio	1 prog/day × 7 days × 48w	=	336 progs.
	Studio Production Capacity Total	=	1,344 progs.
(EFP Capacity)			
Islamabad EFP	1 prog/day × 300 days	=	300 progs.
Karachi EFP	1 prog/day × 300 days	=	300 progs.
Lahore EFP	1 prog/day × 300 days	=	300 progs.
Peshawar EFP	1 prog/4 days × 300 days	=	75 progs.
Quetta EFP	1 prog/4 days × 300 days	=	75 progs.
	EFP Production Capacity Total	=	1,050 progs.

3. Programmes listed in Section 1 can be produced by preparing the equipment shown in Section 2.

Note : - School broadcasts will air 945 programmes annually. These should be produced during the preparation period, with 200 programmes being added or revised every year.
- In calculating the above production capacities, studios are regarded as operational for 48 weeks per annum and EFPs 300 days per annum.

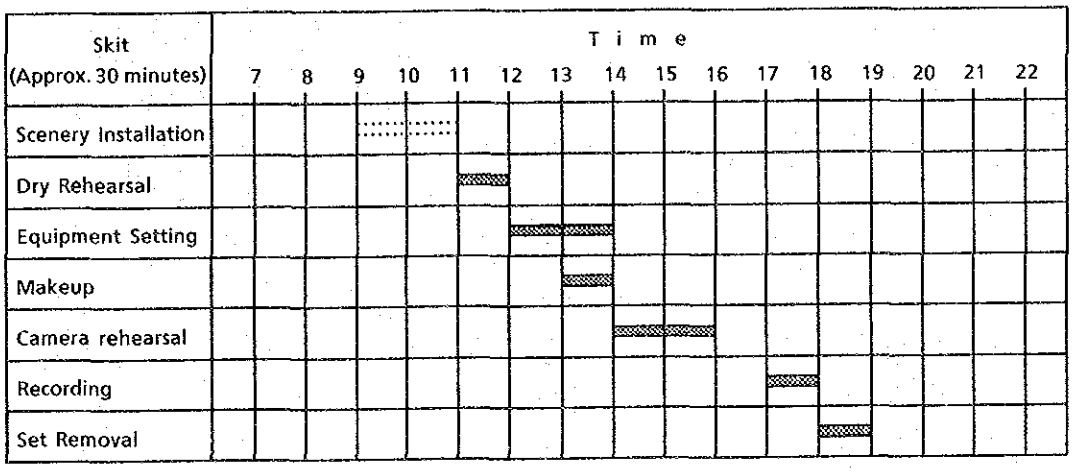
Table-4 The Standard Size of TV Studios Required for Producing Programmes

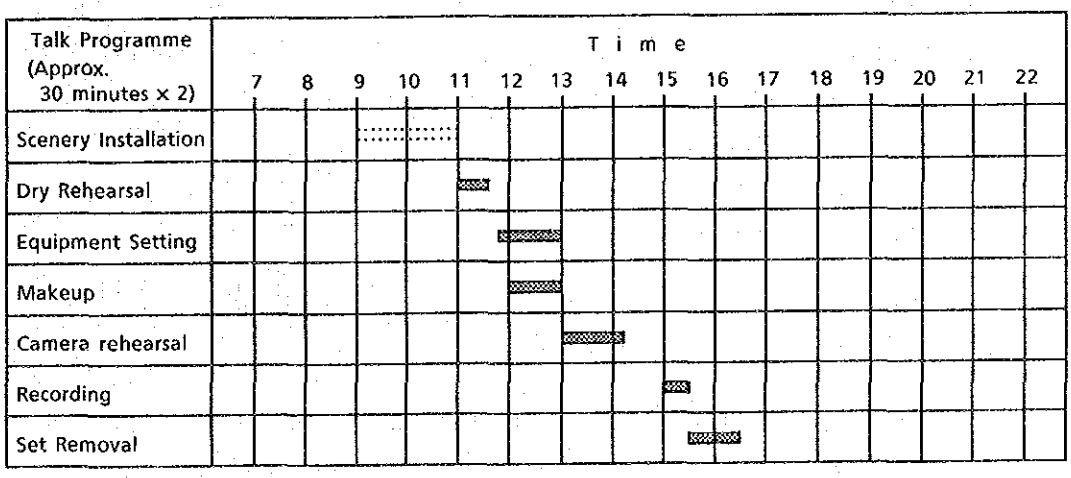
Classification of Television Studio	Television Studio						
	Small Sized	Medium Sized		Large Sized			
	Announce-ment	Dialogue /Lecture	Experiment /Cooking	Music	Drama	Show /Dance	Public Recording
Areas (m^2)	15~50	100~200	150~300	300~600	400~600	400~1200	1000~
Cyclorama Height (m)	3~4	4~5	4~5	6~8	7~9	7~12	10~
(Ancillary Rooms)							
Sound Lock	Required	(Required)	-	(Required)	(Required)	(Required)	-
Control Room	Approx.25m^2	25~80m^2	30~80m^2	45~90m^2	45~90m^2	70~100m^2	70~100m^2
Sub-studio	-	10~20m^2	10~30m^2	Approx.30m^2	Approx.30m^2	Approx.30m^2	Approx.30m^2
Equipment Store	-	40~60m^2	50~60m^2	70~100m^2	80~100m^2	80~150m^2	100~150m^2
Musical Instrument Store	-	40~60m^2	-	50~70m^2	50~70m^2	50~100m^2	70~100m^2
Hand Props. Store	-	-	-	-	(Required)	(Required)	(Required)
Scenery Area	-	40~100m^2	50~120m^2	100~140m^2	240~300m^2	140~300m^2	200~300m^2

Broadcasting technology series vol. 1: Summary of Broadcasting System (compiled by NHK)

b) Number of studios

In studio production, studio occupation time includes pre-recording preparations, such as installing scenery, adjusting lighting, setting up microphones, providing makeup for guests, and rehearsing. Time required for removing scenery and other equipment also needs to be taken into consideration. The charts below show standard times needed for each procedure. Karachi and Lahore need at least one studio each to produce one programme a day.





2) EFP vehicle

An EFP vehicle is a car for outdoor TV production, equipped with portable TV cameras, VCRs, audio-visual mixers, and monitors. It will carry no FPU (microwave) equipment, because ETV conducts no live broadcasting.

Peshawar and Quetta production centres, which cover North-West Frontier Province and Baluchistan Province respectively, will be provided with EFP vehicles to cope with the wide coverage area.

3) EFP equipment

EFP equipment is an outdoor recording unit, made up of portable TV cameras and VCRs. The number of EFP units required is decided based on how many days on average are needed for each case of outdoor coverage. The average is about four days for Lahore and Karachi, which are the hub of education and the economy respectively. Therefore these centres will require 4 units each. Two units each will be newly provided by the Project, while utilizing 2 existing units at each site.

4) Post-production equipment

Post-production equipment carries out editing, framing, and sound mixing (adding background music and narration), on videotapes produced using EFP equipment and EFP vehicles.
The announcer booth is used for adding comments in the standard language (Urdu) to programmes produced in local languages (Karachi:Sindhi, Lahore:Punjabi, Peshawar:Pashto, Quetta:Baluchi). Each centre will be provided with one set each of post-production equipment.

5) Tape editing equipment

Simplified editing equipment will be used for just replacing scenes in tape materials. Karachi and Lahore need at least two sets of editing equipment each, whereas Peshawar and Quetta need one each. Karachi and Lahore will be newly provided with one set each by the Project, while also utilizing the existing one.

6) Measuring equipment

Each centre will be provided with measuring instruments for the effective utilization and maintenance of equipment.

3. Equipment Plan

The following types of equipment are provided to Lahore, Karachi, Peshawar and Quetta Centres.

	Karachi	Lahore	Peshawar	Quetta
Studio Equipment	1 set	1 set	——	——
EFP Vehicle	——	——	1 set	1 set
EFP Equipment	2 sets	2 sets	——	——
Post Production Equipment	1 set	1 set	1 set	1 set
Tape Editing Equipment	1 set	1 set	1 set	1 set
Measuring Equipment	1 set	1 set	1 set	1 set

These types of equipment are installed in the following facilities.

(1) Karachi

Within the current Karachi PTV Centre's premises, a new building of a total floor space of 1,600m² is to be constructed. The equipment will be installed in the new building (See Appendix 5.12 Outline of Karachi ETV Centre Plan).

(2) Lahore

1) Studio

An existing studio (Studio B) (Floor space; about 200m²) in the Lahore PTV Centre shall be rehabilitated for new ETV use. Cameras and sub-control room equipment are to be renewed. The lighting dimmer and the control console are to be replaced with new ones, but the existing hanging devices, lighting devices and cables in the studio shall continue to be used. Some lighting devices are to be added.

2) Post-production and tape editing equipment

A spare room shall be modified and equipped with post-production and editing equipment.

(3) Peshawar

A small building is to be newly constructed by PTV in the Peshawar PTV Centre's premises. A post-production room, tape editing room and EFP equipment maintenance room shall be accommodated in the new building. An EFP vehicle will be parked in the existing garage.

(4) Quetta

By modification of rehearsal room No.2 in the Quetta PTV Centre, a post-production room and tape editing room will be accommodated. An EFP vehicle will be parked in the existing garage, and EFP equipment will be maintained in the neighbouring maintenance room.

4. List of Programme Production Equipment

(1) Studio Equipment

One set each for Karachi & Lahore

One set composed of:

1-1	CCD Studio Camera with 7" Viewfinder, x 20 Zoom Lens, Camera Pedestal	3 sets
1-2	Video Control System with Video & Pulse Distributors	1 set
1-3	Audio Control System	1 set
1-4	1/2-inch Video Cassette Tape Recorder	3 sets
1-5	Opaque Scanner	1 set
1-6	Audio Tape Recorder	2 sets
1-7	Video Monitors	1 set
1-8	Audio Monitors	1 set
1-9	Microphones	1 set
1-10	Microphone Stands	1 set
1-11	Studio Intercom System	1 set
1-12	Lighting System (for Karachi)	
	- Lighting Control System	1 set
	- Cyclorama Curtain	1 set
	- Lighting Equipment	1 set
1-12	Lighting System (for Lahore)	
	- Lighting Control System	1 set
	- Cyclorama Lighting Equipment	1 set
1-13	Synchronizing Pulse Generator	1 set

1-14	TV Test Signal Generator	1 set
1-15	Automatic Voltage Regulator (for Lahore)	1 set

(2) EFP Vehicle

One set each for Peshawar & Quetta

One set composed of:

2-1	FIT CCD EFP Camera with 5" Viewfinder, × 13 Zoom Lens, tripod	3 sets
2-2	1/2-inch Video Cassette Tape Recorder (attached to camera)	3 sets
2-3	Battery & Charger	3 sets
2-4	AC Adaptor	3 sets
2-5	Microphones & Stands	1 set
2-6	Portable Lighting Kit	3 sets
2-7	Video Control System with Video & Pulse Distributors	1 set
2-8	Audio Control Systems	1 set
2-9	1/2-inch Video Cassette Tape Recorder	1 set
2-10	Audio Cassette Recorder	1 set
2-11	Video Monitors	1 set
2-12	Audio Monitors	1 set
2-13	Synchronizing Pulse Generator	1 set
2-14	TV Test Signal Generator	1 set
2-15	TV Test Signal Generator	1 set
2-16	Engine Generator	1 set
2-17	VHF Intercom System	1 set
2-18	Air Conditioner	1 set
2-19	Vehicle (4-wheel-drive, micro-bus Type)	1 set

(3) EFP Equipment

Two sets each for Karachi & Lahore

One set composed of:

3-1	FIT CCD ENG Camera with 5" Viewfinder, × 13 Zoom Lens, tripod	1 set
3-2	1/2-inch Video Cassette Tape Recorder (attached to camera)	1 set
3-3	Battery & Charger	1 set
3-4	AC Adaptor	1 set

3-5	Microphones	1 set
3-6	Portable Lighting Kit	1 set

(4) Post Production Equipment

One set each for Karachi, Lahore, Peshawar & Quetta

One set composed of:

4-1	1/2-inch Video Cassette Tape Recorder	3 sets
4-2	3/4-inch Video Cassette Tape Recorder	1 set
4-3	Opaque Scanner	1 set
4-4	Video Typewriter	1 set
4-5	Computer Graphic System	1 set
4-6	Audio Tape Recorder	2 sets
4-7	Audio Cassette Recorder	1 set
4-8	Editing System	
	- Editing Controller	1 set
	- Video Control System with Video & Pulse Distributors	1 set
	- Audio Control System	1 set
4-9	Video Monitors	1 set
4-10	Audio Monitors	1 set
4-11	Microphones & Stands	1 set
4-12	VHS VCR (for Editing Plan)	4 sets

(5) Tape Editing Equipment

One set each for Karachi, Lahore, Peshawar & Quetta

One set composed of:

5-1	1/2-inch Video Cassette Tape Recorder	2 sets
5-2	Colour Monitor	1 set
5-3	Editing Controller	1 set

(6) Measuring Equipment

One set each for Karachi, Lahore, Peshawar & Quetta

One set composed of:

6-1	Oscilloscope	1 set
6-2	Vectorscope	1 set
6-3	Audio Distortion Meter	1 set
6-4	Audio Variable Attenuator	1 set
6-5	Circuit Tester	1 set

6-6	Illuminance Meter	2 sets
6-7	Colour Temperature Meter	2 sets

5. Basic Design Drawings

Fig.1 Block Diagram of Studio Video System
Fig.2 Block Diagram of Studio Audio System
Fig.3 Block Diagram of Post-Production System
Fig.4 Equipment Layout of Sub-Control Room, Karachi
Fig.5 Equipment Layout of Sub-Control Room, Lahore
Fig.6 Equipment Layout of Post-Production and Editing, Karachi
Fig.7 Equipment Layout of Post-Production and Editing, Lahore
Fig.8 Equipment Layout of Post-Production and Editing, Peshawar
Fig.9 Equipment Layout of Post-Production and Editing, Quetta

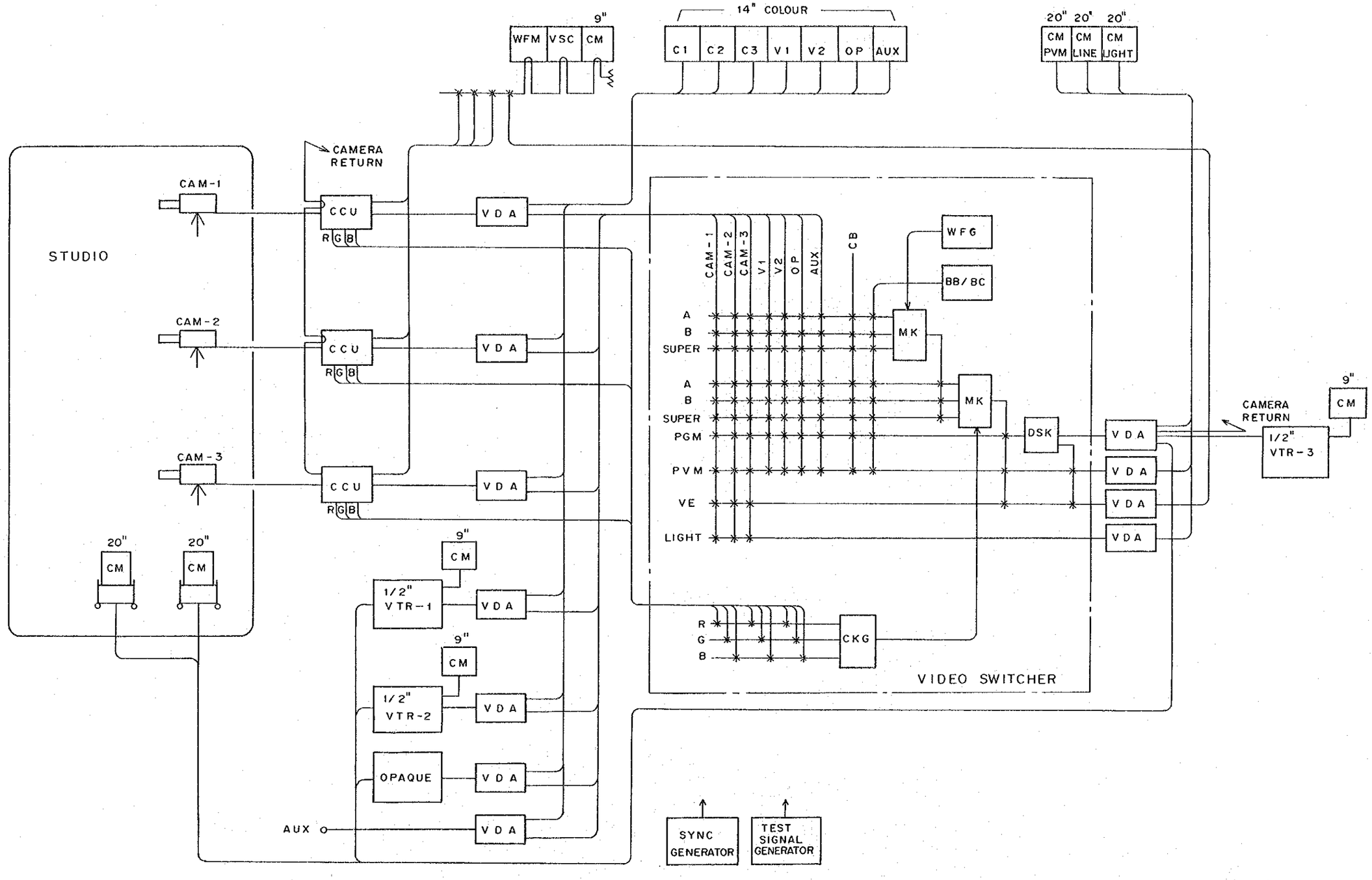


FIG.1 BLOCK DIAGRAM OF STUDIO VIDEO SYSTEM

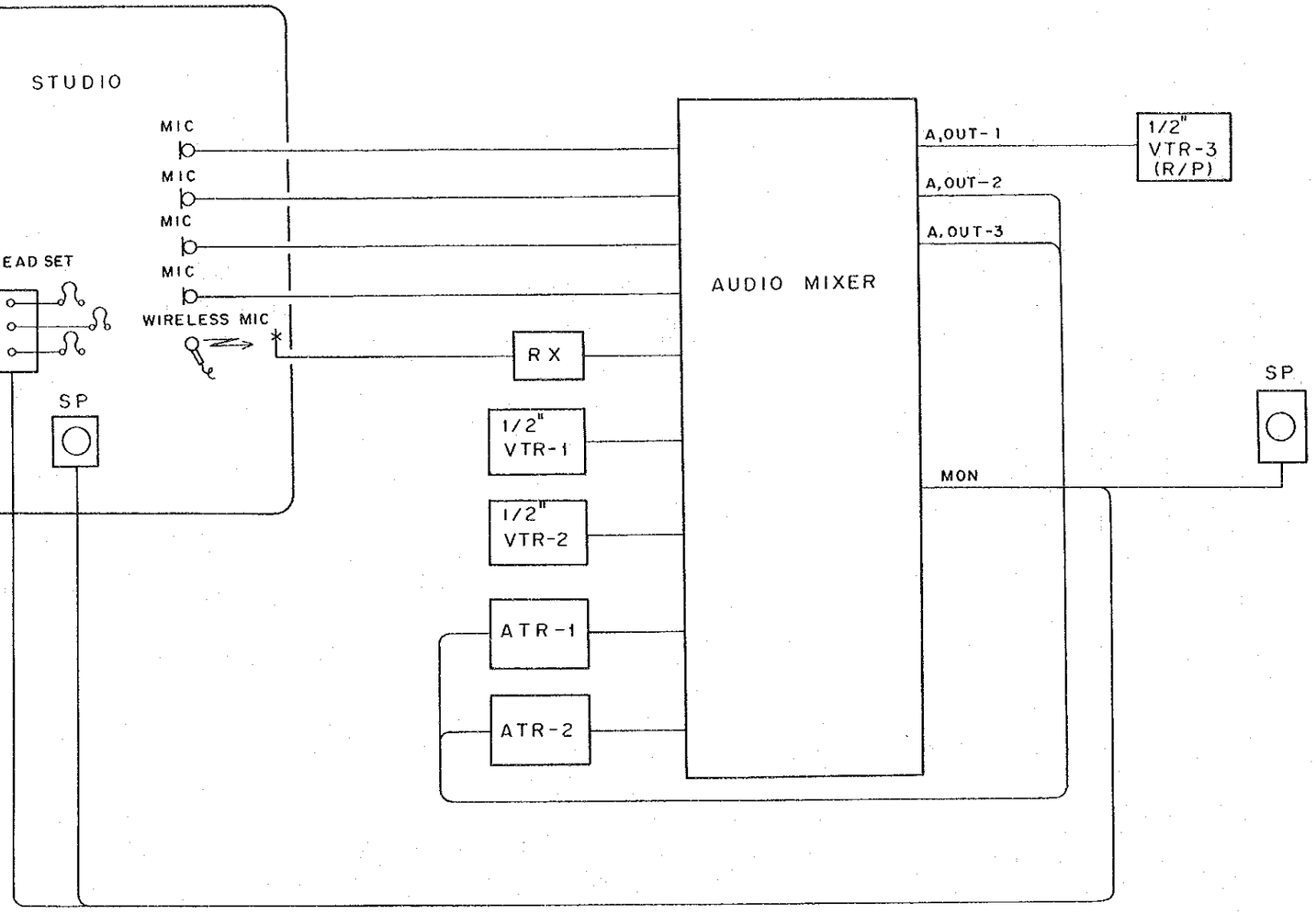


FIG.2 BLOCK DIAGRAM OF STUDIO AUDIO SYSTEM

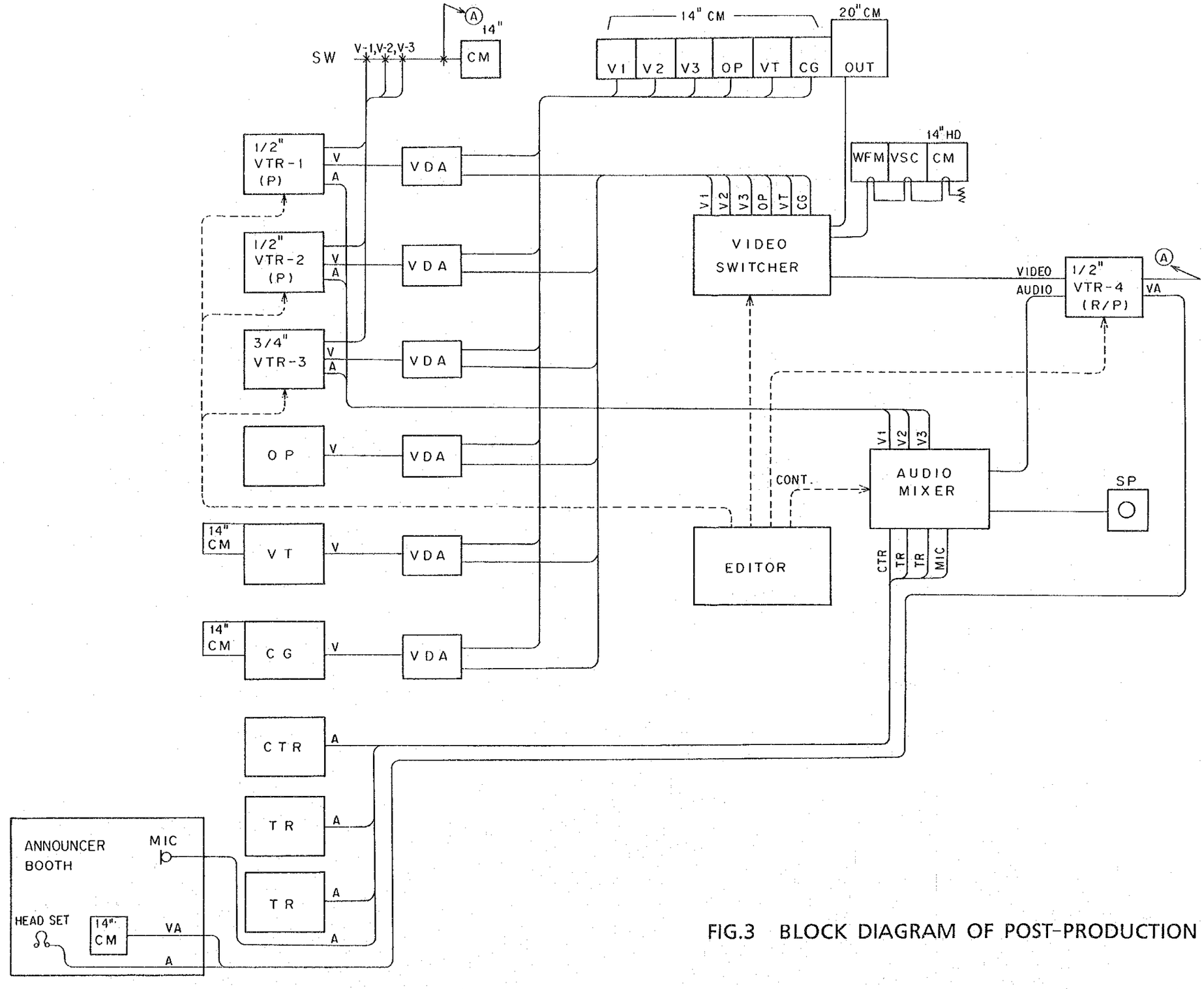
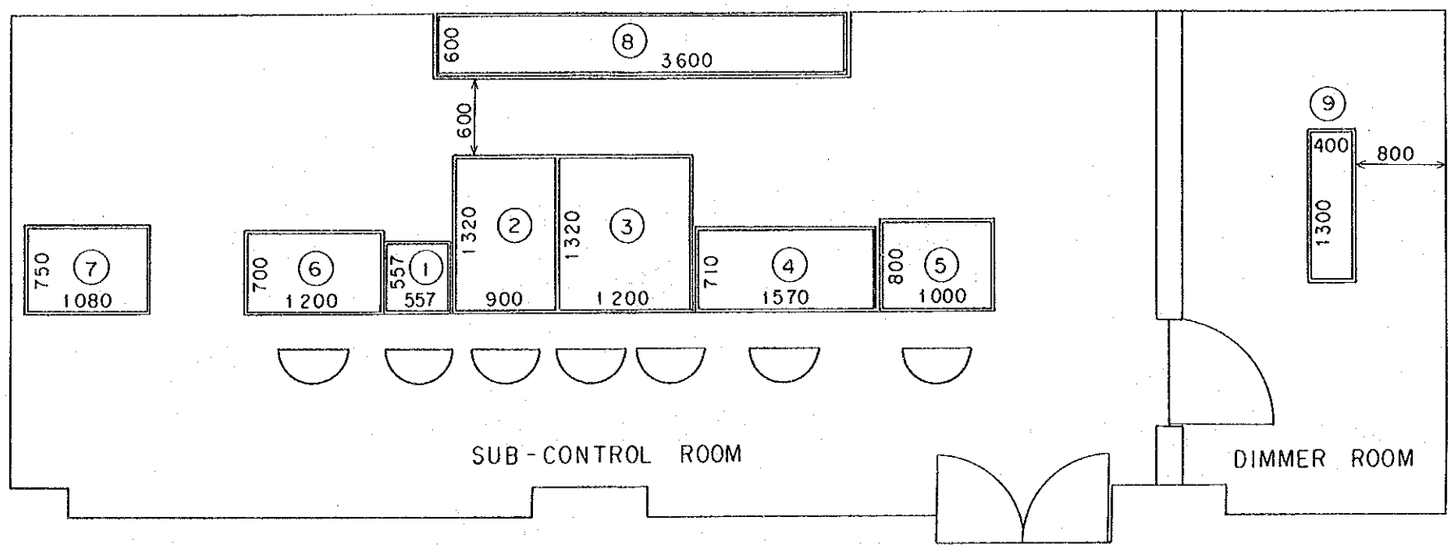


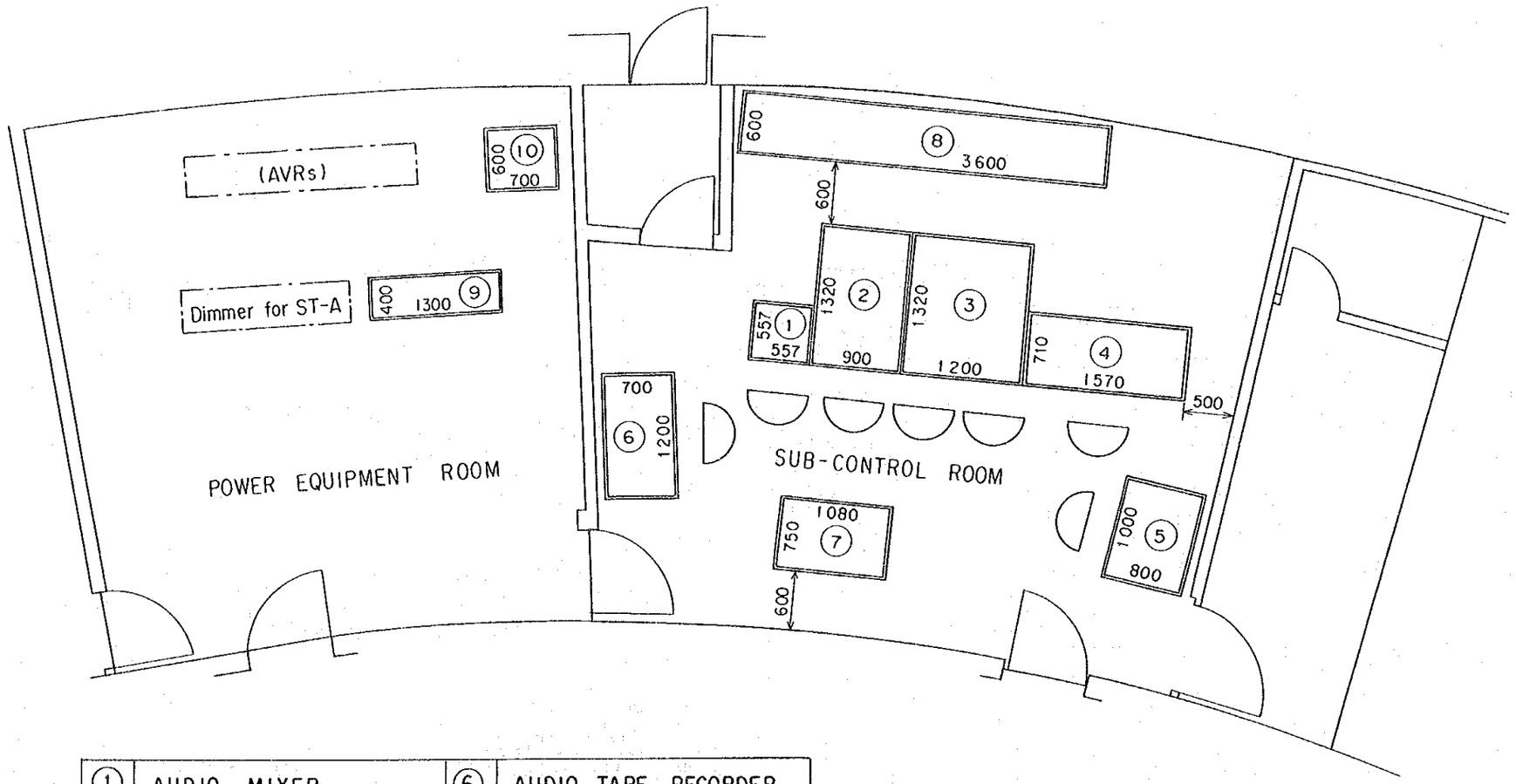
FIG.3 BLOCK DIAGRAM OF POST-PRODUCTION SYSTEM



①	AUDIO MIXER	⑥	AUDIO TAPE RECORDER
②	PD/VE CONSOLE	⑦	EQUIPMENT RACK
③	VIDEO SWITCHER	⑧	MONITOR SHELF
④	LIGHTING CONSOLE	⑨	DIMMER
⑤	OPAQUE SCANNER		

SCALE : 1/50
UNIT : mm

FIG.4 EQUIPMENT LAYOUT OF SUB-CONTROL ROOM, KARACHI

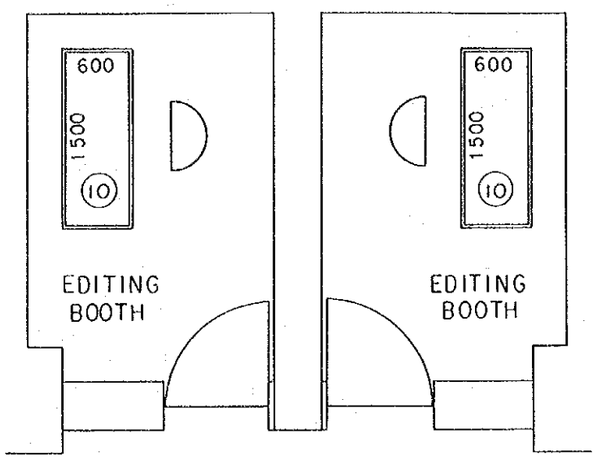


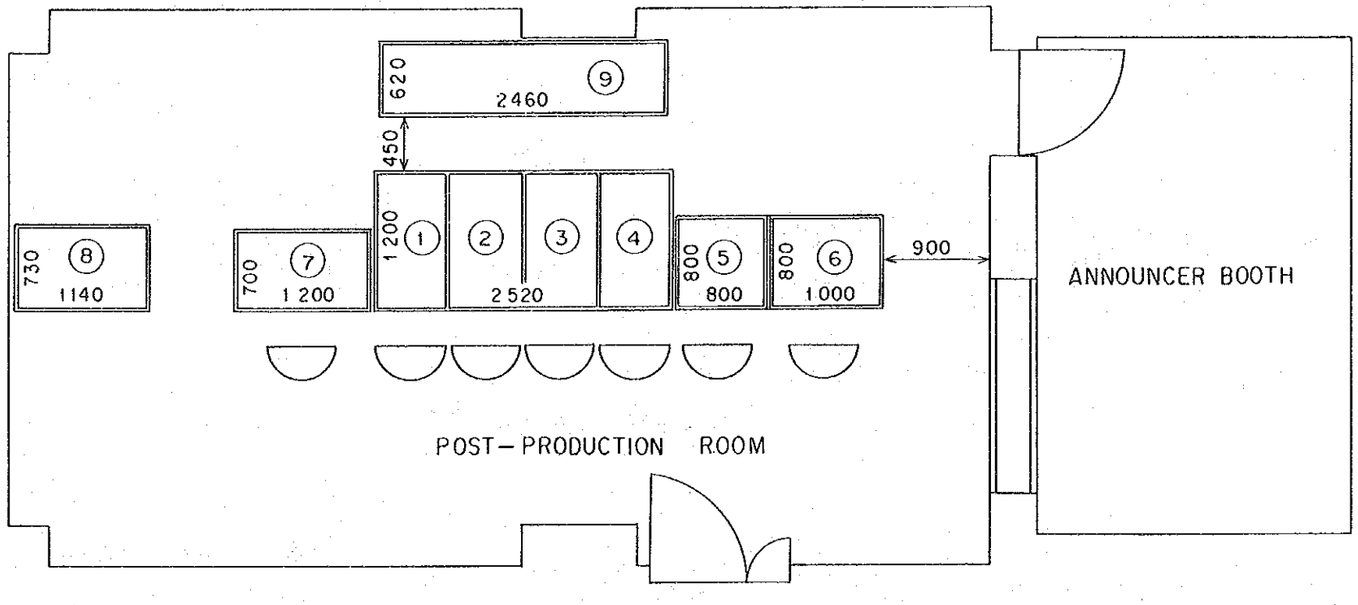
①	AUDIO MIXER	⑥	AUDIO TAPE RECORDER
②	PD/VE CONSOLE	⑦	EQUIPMENT RACK
③	VIDEO SWITCHER	⑧	MONITOR SHELF
④	LIGHTING CONSOLE	⑨	DIMMER
⑤	OPAQUE SCANNER	⑩	AVR

SCALE : 1/50
UNIT : mm

FIG.5 EQUIPMENT LAYOUT OF SUB-CONTROL ROOM, LAHORE

①	AUDIO MIXER
②	EDIT CONTROLLER
③	VIDEO SWITCHER
④	COMPUTER GRAPHICS
⑤	VIDEO TYPEWRITER
⑥	OPAQUE SCANNER
⑦	AUDIO TAPE RECORDER
⑧	EQUIPMENT RACK
⑨	MONITOR SHELF
⑩	EDITING TABLE





SCALE : 1/50
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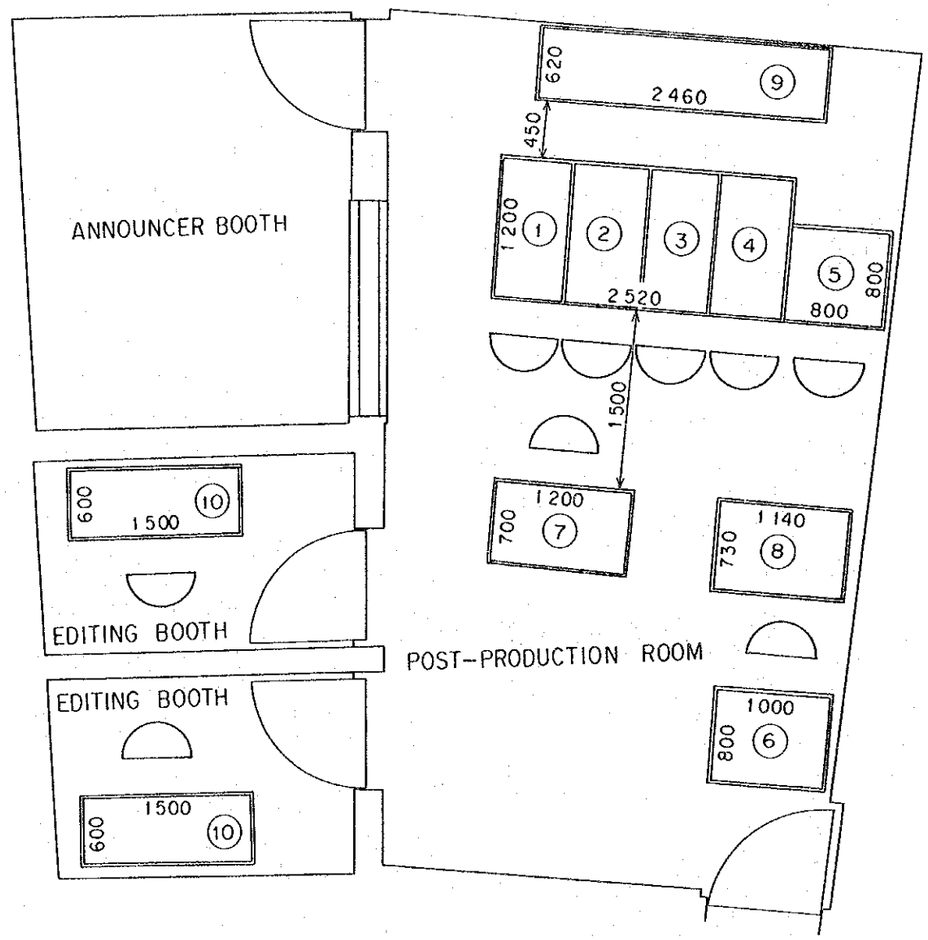
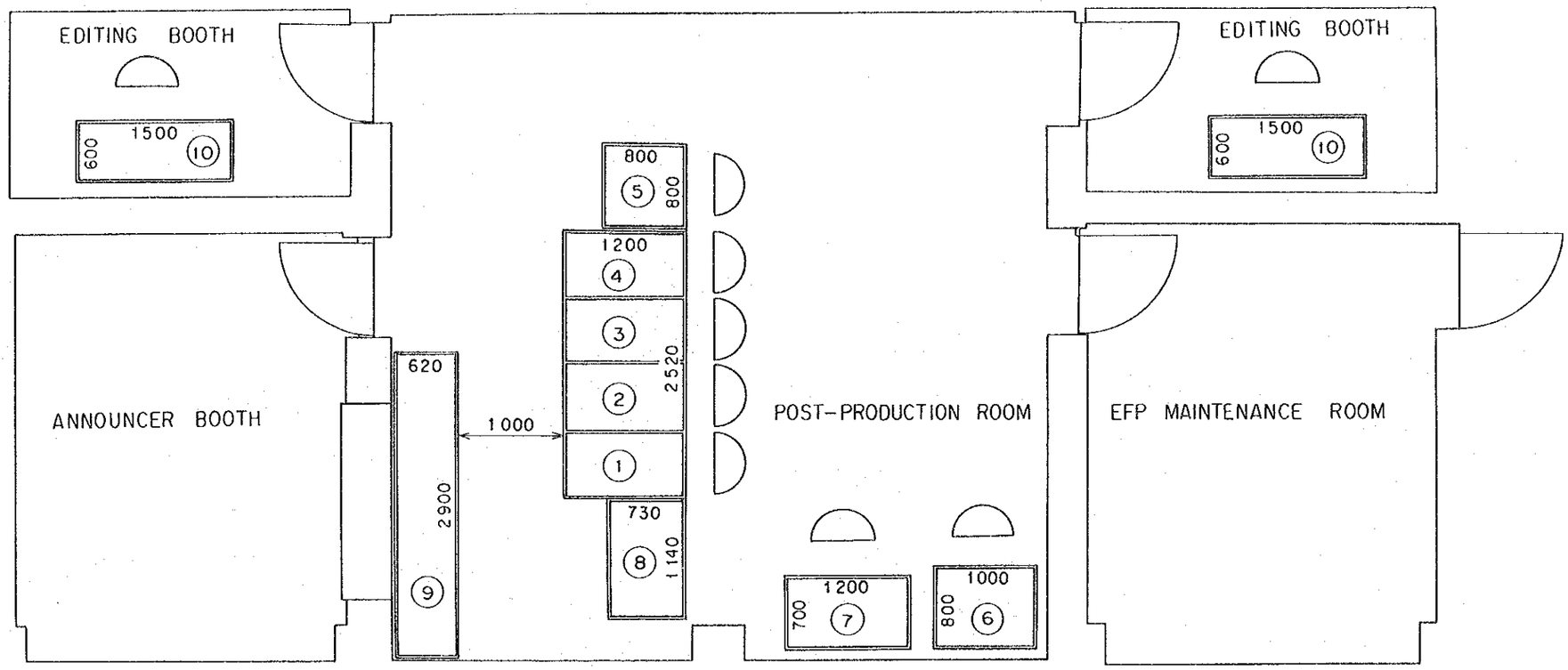
FIG.6 EQUIPMENT LAYOUT OF POST-PRODUCTION AND EDITING, KARACHI



①	AUDIO MIXER
②	EDIT CONTROLLER
③	VIDEO SWITCHER
④	COMPUTER GRAPHICS
⑤	VIDEO TYPEWRITER
⑥	OPAQUE SCANNER
⑦	AUDIO TAPE RECORDER
⑧	EQUIPMENT RACK
⑨	MONITOR SHELF
⑩	EDITING TABLE

SCALE : 1/50
UNIT : mm

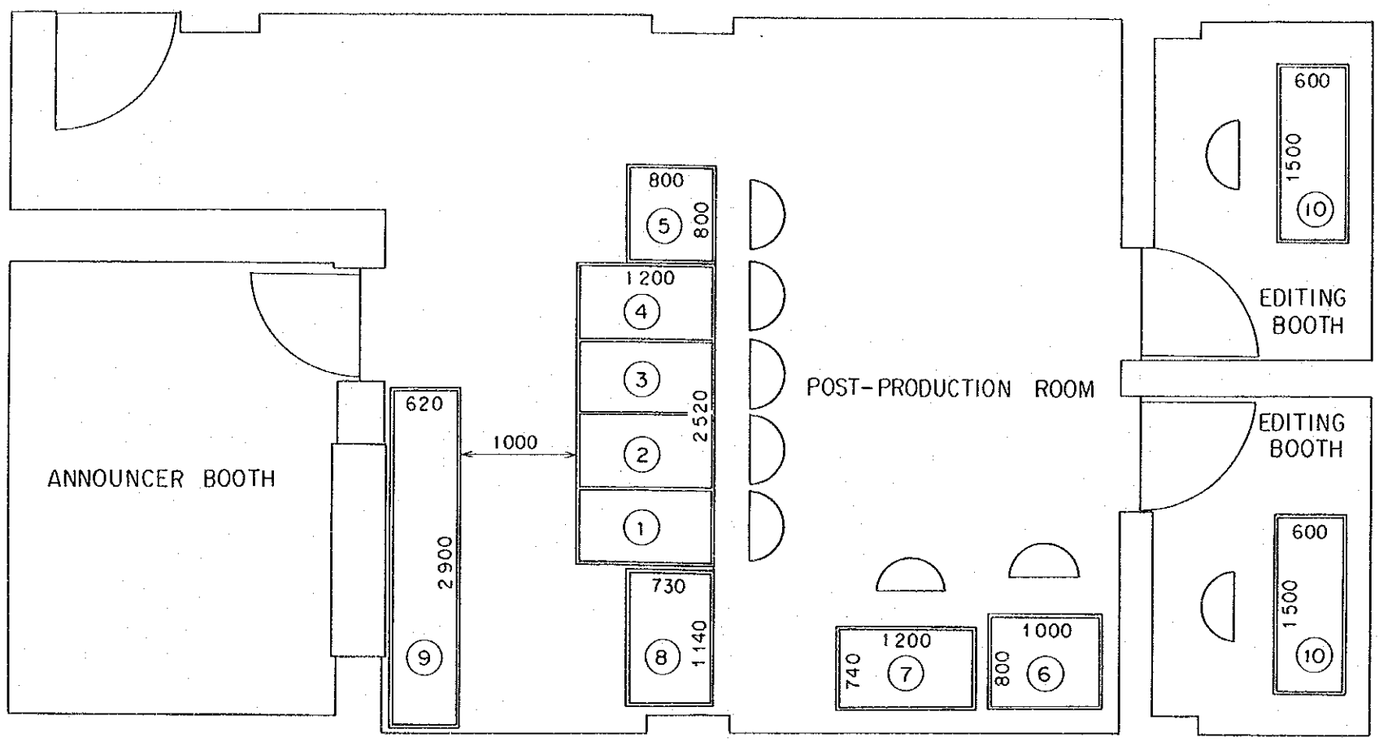
FIG.7 EQUIPMENT LAYOUT OF POST-PRODUCTION AND EDITING, LAHORE



①	AUDIO MIXER	⑥	OPAQUE SCANNER
②	EDIT CONTROLLER	⑦	AUDIO TAPE RECORDER
③	VIDEO SWITCHER	⑧	EQUIPMENT RACK
④	COMPUTER GRAPHICS	⑨	MONITOR SHELF
⑤	VIDEO TYPEWRITER	⑩	EDITING TABLE

SCALE : 1/50
UNIT : mm

FIG.8 EQUIPMENT LAYOUT OF POST-PRODUCTION AND EDITING, PESHAWAR



①	AUDIO MIXER	⑥	OPAQUE SCANNER
②	EDIT CONTROLLER	⑦	AUDIO TAPE RECORDER
③	VIDEO SWITCHER	⑧	EQUIPMENT RACK
④	COMPUTER GRAPHICS	⑨	MONITOR SHELF
⑤	VIDEO TYPEWRITER	⑩	EDITING TABLE

SCALE : 1/50
UNIT : mm

FIG.9 EQUIPMENT LAYOUT OF POST-PRODUCTION AND EDITING, QUETTA

5.12 Outline of Karachi ETV Centre Plan (for reference only)

1. Construction site

(1) Selection of the construction site

The existing Karachi PTV Centre is located in a town about 5km north-east of Karachi city centre. It is at the edge of a fan-shaped block, surrounded by roads on three sides. The property, measuring 180 meters north to south and 60 meters east to west, has a studio building, office quarter, film laboratory, workshop unit, and steel tower, all built between 1966 and 1980 in a series of extensions. The facilities cover most of the 10,000m² plot of land.

In the late 1980s, a plan to shift the PTV Centre to Karachi's suburbs started to formalize, because of space problems as well as consideration of the noise pollution in the current location as unconducive to the work of a television studio. The plan also envisaged building an ETV Centre at a new site. PTV chose one property, but failed to agree on the price with the owner. Then, concerns about large transfer expenses eventually annulled the plan.

This ETV Project has been made on the pre-condition that a new ETV Centre will be built on the premises of the existing PTV Centre. After carefully studying and debating the matter, it has been confirmed that some of the existing facilities at the south-western corner will be demolished to make room.

Two buildings will be subject to demolition; one is the workshop unit and the other is the customs office/warehouse for imported materials and equipment used by the PTV Centre. Both buildings are almost 30 years old and are among the most worn-out facilities in the compound. The functions of these buildings will be transferred to the adjacent film laboratory, which has ample unused space.

(2) Natural conditions

Karachi is situated at lat. 25° N. and long. 67° E., 0~150 metres above sea level, facing the Arabian Sea. The city has Pakistan's largest international port facility and serves as the base for international flights. It is a commercial city, developed as a centre for distribution.

The city's climate is tropical in summer and semi-tropical in winter. Average temperatures are between 27~31°C (average humidity around 70~80%) from April to October, and between 19~25°C (average humidity around 35~60%) from November to March. The weather is generally hot and humid throughout the year. According to meteorological data over the past six years, the temperature went to an all time high of 45.5°C in June, 1989, and an all-time low of 2.2°C in December, 1990.

Precipitation is extremely low, with the annual amount of rainfall averaging 136mm over the past six years. Rain falls about ten days a year, only during the monsoon season between July and September with very few exceptions. Once every few years, the monsoon season brings heavy downpours, flooding the city, which does not have a sophisticated drainage system. In the latest example, Karachi was flooded in July, 1994, while study for this Project was underway.

(3) Social infrastructure

The current PTV Centre, planned site for the new ETV facility, faces Shahid Sibghat Ullah Shah Pir Pagra Road, which branches from University Road, running across the city. Therefore, there is no problem in regard to road access, except for the city's chronic problem of traffic congestion. Also, since the new facility will be built inside the compound of a currently operational television station, all utilities, including electricity, telephones, gas, and water, are already available. However, the service is not quite sufficient to facilitate the new ETV Centre, or may even be a major obstacle to its construction. The following are anticipated problems in connection with the supply of commercial-use electricity and sewage treatment.

- Commercial-use electricity: Most of the nation's commercial-use electricity is supplied by the Water and Power Development Authority(WAPDA). But in the Karachi area, the supplier is the Karachi Electric Supply Corporation (KESC). The company, which is totally thermoelectric, is facing increasing difficulty meeting the growing demands to supply power to new factories and buildings in the Karachi suburbs.

- Sewage treatment: The roads, surrounding the PTV Centre, are laid with drainage pipes and sewage pipes. However, it is doubtful whether they are functioning properly. On one occasion, during the site survey, 20mm/h of rain fell for three hours in the area. It flooded part of the paved areas inside the compound, as well as many roads throughout the city. In August, 1992, a heavy downpour, which generated 91.7mm of rain in one day, flooded the PTV facilities by 30cm.

These two problems will form very important factors in planning the construction of the new facility. Emergency power supply systems will be essential. The possibility of flooding also needs to be taken into consideration in the construction plan, because the facility will house various types of broadcasting equipment for information transmission.

2. Study and Examination of Design Criteria

(1) Functions of the facility

The Karachi TV Centre will have a studio and lighting equipment, capable of producing a 30-minute programme per day, in accordance with its programming plan. It will also facilitate the editing of EFP programmes and feature post-production functions. Studio-produced educational programmes range from lectures, interviews, and science experiments, to cooking programmes. Educational quiz shows, skits, and music programmes will also be included for better effects. Therefore, the centre will need a mid-sized studio for the production of the above-mentioned programmes. Considering broadcasting hours and available space on the premises, the studio size is set at around 150m^2.

The facility will also require the following rooms.

1) Production related rooms

A mid-sized studio, a sub-control room, a post-production room, an announcer booth, a dimmer room, a scenery area, props room, and two tape editing rooms.

2) Maintenance related rooms

A tape library, camera store, EFP equipment room, and a maintenance room.

3) Rooms for performers and staff

A rehearsal room, a meeting room, makeup rooms and wardrobes for men and women, and three staff rooms.

4) Utility rooms

An electricity room, a pump room, and two air-conditioning machine rooms. A power receiving room and a generator room in a separate building.

5) Other communal space

Lavatories (for men and women), corridors, staircases, and others.

(2) Personnel capacity and facility space

1) Personnel capacity

Under the current plan, the number of staff members for the Karachi ETV Centre is set at 92, all of whom will work on the premises. When adding the about 30 people expected to come as guests, the centre's personnel capacity will be 120. The details of the staff members are 8 managers, 58 production staff (18 producers and 40 production crew), and 26 technicians. Managers and producers will be given their own working rooms, and other staff will be assigned to work in rooms for production and maintenance activities.

2) Facility space

The following are the floor spaces for each section, based on its function, required number of rooms, and assigned number of staff.

Production related rooms:	485m²
Maintenance related rooms:	90m²
Rooms for performers and staff:	235m²
Utilities rooms:	330m²

Other communal space: 480m²

Therefore, the total floor space will be about 1,600m².

(3) Building Regulations

When constructing a new building in Karachi, one must apply to the Karachi Development Authority (KDA) for an approval of the building design and the permit to go ahead with its execution. KDA obligates the use of the following building and town planning regulations and seismic load calculation standards.

1) Building Regulations

In their composition, these regulations are similar to the Japanese Building Standard Law, with provisions concerning such items as the procedures for application for approval, the minimum distance to be maintained between the nearest road and the building, sizes of the rooms required according to building types, standard floor loads and fire-resistance standards. These regulations also contain items that are more in the nature of specifications relating to execution, and these generally conform to the British Standards (BS).

2) Town Planning Regulations

These regulations specify the town planning areas within the city of Karachi, classify these areas into zones according to their uses, and lay down the rules which are to be observed in each zone concerning such items as the building coverage, height limitations and the amount of space to be left between the building and the adjacent site. The present site of the PTV Centre, which is the project site, is not a part of a designated town planning area.

3) Seismicity of Karachi

These standards, which are based on the Uniform Building Code (UBC, 1982), the American design standards, classify the whole of Pakistan into zones according to the frequency and scales of earthquakes observed in each area, and specify the zonal factors to be used in the calculation of the design seismic load in each zone.

No definite answers could be obtained from the staff at KDA as to whether a strict observance of the above regulations and standards would be required in the construction of a building in Karachi under Japanese grant aid cooperation, partly as there have only been a few cases of facilities constructed in the past in Karachi under this grant aid system. All these standards, however, are common-sense, and it is suggested that a thorough study should be made of these standards at the time of detailed design to check that all the relevant items are being adhered to.

3. Basic Plan

(1) Site Layout Plan

The customs warehouse and workshop located in the south-western part of the proposed site will be removed and the site left vacant by their removal will be utilized. Like the existing customs warehouse, the newly-constructed building will run parallel to the fence along the road on the south-western side of the site, and the wall here will occupy the same position as the wall of the customs warehouse. For the access to the new building, the present emergency gate on the south-eastern side of the site will be used, and the main entrance to the building will be made to face this gate. The axial direction of the new building will thus be the same as that of the existing warehouse building, and this layout will provide an on-site road space with a width of approximately 8m between the new building and the existing film laboratory, allowing easy access to such facilities as the pylon and water tank at the back of the film laboratory. The power receiving room and generator room, which will have to be accommodated in a separate building, will be positioned in the corner nearest to the road at the back of the building (western end of site).

(2) Building Plan

1) Floor Plan

The studio will be positioned at the centre of the building perpendicular to the axial direction of the building. The building will be divided into a number of zones centered around the studio in such a way as to provide functional connections between the studio and the studio-related technical rooms, maintenance-related rooms and the rooms for staff and performers. The basic zoning will be as follows. The studio-related technical rooms and performers' rooms will be positioned in front of the studio towards the entrance. The staff and maintenance-related rooms will be situated to the right of the studio, while the scenery area and air-conditioning machine rooms, which take up relatively large floor areas, will be located at the back of the studio, together with those rooms accommodating building equipment, such as the electricity room and pump room. The areas of the required rooms and the calculation conditions used are given below.

(Room)	(Area)	(Calculation Standard)
Studio	150m²	See "5.11 Outline of Programme Production Equipment Plan"
Sub-Control Room	55m²	From layout of required equipment
Post Production Room	45m²	ditto
Announcer Booth	15m²	ditto
Tape Editing Rooms (×2)	15m²	ditto
Tape Store	25m²	Number of tapes to be stored unknown; minimum appropriate space
Dimmer Room	20m²	From layout of required equipment
Camera Store	15m²	From quantity of required equipment
EFP Equipment Room	25m²	ditto
Maintenance Room	25m²	ditto
Rehearsal Room	40m²	Approx. 30% of effective area of Studio

Makeup Rooms/Wardrobes (male and female)	50m²	Minimum appropriate space from types of programmes to be produced
Scenery Area/Props Room	125m²	ditto
Scenery Assembly Shop	60m²	ditto
Staff Rooms (×3)	85m²	Approx. 5.5 m²/person, together with Conference Room
Conference Room	60m²	ditto
Air-Conditioning Machine Rooms (ACMR; ×2)	210m²	From layout of required machinery
Electricity Room	40m²	ditto
Pump Room	20m²	ditto
Lavatories/Corridors/ Staircases, etc.	480m²	From zoning under layout/sectional plan
Power Receiving Room/ Generator Room (separate block)	60m²	From layout of required machinery
Total Floor Area	1,620m²	

2) Sectional Plan

In line with the types of programmes to be produced and the studio lighting plan (fixed lighting, maintenance from below), the studio horizonts and grid pipes will be positioned 4.5m and 5m respectively, above the floor, and this will mean that a height of approximately 9m will suffice for the distance between the studio floor and the ceiling slabs. Of the various rooms required, rooms such as the scenery area and air-conditioning machine rooms will need floor heights in excess of 4m. While a ceiling height of around 3m will be sufficient for those rooms which are to be provided with ceilings, such as the technical rooms and staff rooms, clearances of 70 to 80 cm will have to be provided as the duct space under the beams in the ceilings here. In view of these considerations, and with a view to ensuring the structural simplicity of the building, the story height will be set at 4.5m. In the light of the relationship of the required floor area to the available space on the proposed site, the building will be made two-storied (a third story used to accommodate a part of the air-conditioning machine rooms), and

the studio will be given a floor height corresponding to two stories. In consideration of the possibility of flooding on the site at times of heavy rain, the ground floor level will be raised one meter above the surrounding ground, and rooms accommodating important broadcasting equipment (sub-control room, announcer booth, post-production room, tape editing rooms, dimmer room, tape store, etc.) will all be located on the first floor.

3) Structural Plan

A reinforced concrete rigid-frame structure, which is the most widespread type in Pakistan, will be adopted. Walls will be of brick or concrete block masonry. Surveys have not been made on the ground bearing capacity, but judging from the drawings of the existing customs warehouse building, one can expect a bearing capacity of around 20 t/m^2 which will allow the use of independent footings. The loads used in the structural calculations will be as follows. For the live load, the actual weight of the machinery will be used. For the wind load, the design standard wind speed will be set at 40 m/s (standard value recommended by KDA: 38.9 m/s) on the basis of the maximum wind speed recorded in Pakistan (at Islamabad) during the past 33 years. The seismic forces will be calculated using a zonal factor of 3/8 which applies to Karachi under the aforementioned UBC standard.

(3) Building Equipment Plan

1) Electrical Equipment

a) Power Receiving/Transformer Equipment

A new on-site substation will be constructed in the proximity of the centre building, and a 500 kVA class main transformer and switch gear will be installed here for the reception of power (primary side, 3-phase, 3-wire, 11 kV, 50 Hz) via underground cables from the existing on-site substation (operated by the Karachi Electric Supply Corporation, KESC).

On the secondary (low voltage) side of the transformer, power will be sent to the broadcasting and lighting equipment, and socket outlets, as well as air-conditioning, water supply/drainage and sanitary equipment at 400/230V (3-phase, 4-wire). The electricity room situated within the centre building will accommodate such equipment as the main distribution panel, automatic voltage regulator (AVR), isolation transformer and uninterruptible power supply device (UPS). Closed (cubicle) type equipment will be used here to ensure the facility of installation work, as well as their reliability and safety.

b) Emergency Power Supply

In consideration of the level of stability and reliability of the commercial power supply and of the importance of TV programme production, a diesel engine generator (3-phase, 4-wire, 400/230V, 50 Hz, output: approx. 150 kVA) will be installed in the generator room adjacent to the on-site substation in preparation for interruptions of commercial power supply. The generator will be of the automatic starting type, and will be provided with a device for automatic switching from the commercial power supply to generator power supply. Power will be supplied from the generator only to important machinery that cannot tolerate long stoppages of power, such as the broadcasting equipment and the related lighting equipment.

c) Mains and Power Wiring

The mains systems will include those used for the supply of power to the broadcasting equipment, lighting/socket outlets, air-conditioning/ventilation equipment, water supply/drainage/sanitary equipment and studio lighting. Cable racks, metallic conduits and PVC conduits will be used in the wiring of these mains to ensure their durability, economy and facility of installation. Utmost care will be taken to avoid these power mains contacting or crossing broadcasting equipment

and their wiring so as to prevent the effects of electrical interference and noise on broadcasting equipment.

d) Lighting

For reasons of colour rendition and economy, fluorescent lighting will be used for the majority of the lights. The illumination level in each room will be as outlined below in accordance with JIS specifications and with consideration also given to local conditions.

TV Studio, Sub-Control Room, Office Rooms, Rehearsal Rooms, etc.	400 lx
Electricity Room, ACMR, Scenery Area, Tape Store, etc.	200 lx
Corridors, Staircases, Anterooms, Wash Rooms, etc.	100 lx

The fluorescent lighting equipment will be ceiling-recessed in such rooms as the sub-control and office rooms, and surface-mounted in such rooms as the TV studio, electricity room, air-conditioning machine rooms and scenery area.

In the fluorescent lighting equipment for the studio, the ballasts will be separated and isolated to avoid their noise affecting the broadcasting equipment.

e) Socket Outlets

Besides the socket outlets for general use, outlets for specialized use (e.g.broadcasting equipment, geysers) will be installed according to need.

Their shapes and specifications will correspond to those in general use in Pakistan.

f) Fire Alarms

A required minimum of fire alarms will be installed taking into consideration the importance of the TV Centre. Heat or smoke detectors will be installed in all the rooms except the lavatories. Manual fire alarms and alarm bells

will be located at strategic points such as in the corridors, and controls will be installed at a location which will be manned on daily basis.

g) Telephones

Lines will be laid to terminal boxes, between the terminal boxes and from the boxes to the telephone outlets to enable telephones to be located in the required positions in each room.

h) Earthing

The following earthing devices and corresponding terminal boxes will be installed and provided with the necessary wiring for the protection of building and broadcasting equipment.

(Machinery)	(Earthing Resistance)
High-Voltage Machinery	10Ω or less
Low-Voltage Machinery	10Ω or less
Broadcasting equipment	10Ω or less
Telephone Lines	100Ω or less

i) Clocks

Battery-operated wall clocks will be installed in all the rooms except the corridors, lavatories, wash rooms and those rooms where clocks are provided with the broadcasting equipment.

j) Communal TV Reception System

The necessary equipment and wiring will be provided to allow the reception of TV broadcasts in such rooms as the director's room, conference room and staff rooms via a common aerial.

2) Air-Conditioning and Ventilation Equipment

a) Air-Conditioning Equipment Plan

Pakistan is situated in a high-temperature zone, and in summer the temperature may rise to nearly 46°C in Karachi. Air-conditioning equipment is therefore of extreme importance in maintaining an appropriate environment for the production of TV programmes and for the protection of the broadcasting equipment. At the same time, there is a great variety in the times at which different rooms are used at the ETV Centre, and long-term stoppage of air-conditioning equipment may cause serious interruption of programme production activities. In view of these considerations, air-cooled package air conditioners will be installed in a number of separate systems at the Centre. The reasons for the selection of these air-cooled package air conditioners include their adaptability to partial operation, their relative freedom from breakdowns, which makes them economical, and the facility of maintenance, which dispenses with the need for specialist engineers.

Several air conditioners will be installed in the studio to prevent a total stoppage of air conditioner operation there with its high heat dissipation density resulting from the large amount of heat dissipated by the lighting equipment.

b) Air-Conditioning Design Conditions

The design conditions for the air-conditioning equipment will be as shown below. These values are based on the meteorological data (1988-1993) in the possession of the Pakistan Meteorological Department (PMD), and the ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) design standards, which are used internationally in the design of air conditioners.

- Outdoor Temperature
  Summer: 36.7°C D.B. 74% R.H.
  Winter: 10.6°C D.B. 65% R.H.
  Average maximum temperature: 42.8°C D.B.

- Indoor Temperature
  Summer: 26.0±3°C D.B. 50±10% R.H.

c) Air-Conditioned Rooms

The rooms to be air-conditioned and the occupancy loads will be as in Table-1 below.

Table-1 Air-Conditioned Rooms and Occupancy Loads

Floor	Rooms	Occupancy load (persons)
Ground	Studio Camera Room	30
	Rehearsal Room	10
	Conference Room Entrance Hall	8
	Director's Room	5
	Makeup Room (1) Makeup Room (2) Wardrobe EFP Equipment Room	4
	Secretary's Room	2
First	Sub-Control Room Post-Production Room	9
	Office Room (1) Maintenance Room	5
	Office Room (2)	4
	Tape Editing Room (1) Tape Editing Room (2) Dimmer Room	3
	Announcer Booth Tape Store	2

d) Air-Conditioning Method and Target Noise Criterion Values

The air-conditioning methods and target noise criteria (NC) values will be as shown in Table-2. As dust is sometimes generated during work in the studio, the blower for the studio air conditioners will also be used for exhaust, and the switches for this purpose will be installed on a panel in the sub-control room. The

operation conditions of the air conditioners and alarms indicating breakdowns will be monitored in the maintenance room.

Table-2 Air-Conditioning Method and Target NC

Floor	Rooms	Target NC
Ground	Studio	25 - 30
	Camera Room	30 - 35
	Rehearsal Room Makeup Room (1) Makeup Room (2) Wardrobe Conference Room Director's Room Secretary's Room EFP Equipment Room Entrance Hall	40 - 45
First	Announcer Booth	25 - 30
	Sub-Control Room Post-Production Room Tape Editing Room (1) Tape Editing Room (2)	30 - 35
	Tape Store Office Room (1) Office Room (2) Maintenance Room	40 - 45
	Dimmer Room	45

e) Ventilation Equipment

e-1) Mechanical Ventilation Equipment

Mechanical ventilation equipment will be provided in those rooms which are subject to the generation of heat, dust, odour and humidity, and the ventilation methods and ventilation frequency will be as shown in Table-3. The permissible room temperature, allowing for heat generation from the machinery installed, will be 50°C for the generator room, and 45°C for the electricity room and power receiving room.

Table-3 Ventilation Method

Rooms	Ventilation Method	Ventilation Rate
Scenery Area, Props Room, Equipment Rooms, Pump Room	Class 1	5 times/hour
Electricity Room, Scenery Assembly Shop, Power Receiving Room, Generator Room		8 times/hour
Kitchenette, Stores	Class 3	5 times/hour
Lavatories		30 m^3/m^2

e-2) Fixed Ceiling Fans

Fixed ceiling fans will be installed only in the scenery assembly shop.

3) Water Supply, Drainage and Sanitary Facilities

a) Water Supply

Water will be supplied by gravity supply from the elevated water tank on the roof. The planning water supply (receiving tank capacity) is calculated by adding the allowance for fire-extinguishing water to the estimated two-day demand.

- Water used/day: 120 persons × 100 ℓ/person·day
  = 12,000 ℓ/day (12 m^3/day)
- Fire-extinguishing water: 4.5m^3
  (= 1,000 British gallons)
- Receiving tank capacity: 12 m^3/day × 2 days + 4.5m^3
  = 28.5m^3 ≒ 29m^3

b) Hot-Water Supply

Electric storage heaters will be installed for the basins in the makeup room and in the kitchenettes.

c) Drainage

Separate systems will be provided within the building for general waste water and sanitary sewage. The two systems will join each other outside the building, and will be connected thence to the existing system operated by KDA

along the road in front of the building.

Drainage channels will also be constructed for storm water, and will be connected to the existing KDA system along the road in front of the building.

d) Sanitary Facilities

Wash basins and Western and Asian-style toilets will be provided in the lavatories, and water taps will be installed in the booths. Showers will be installed in the makeup rooms.

e) Fire Extinguishers

Indoor fire hydrants (water outlets for use by firemen) will be installed at strategic positions. Each room will be equipped with carbon dioxide or dry chemical fire extinguishers according to the likelihood for the need for combatting electrical or general fires.

(4) Basic Design Drawings

See following pages.

FIG.1 LOCATION OF KARACHI PTV CENTRE

FIG.2 SITE LAYOUT PLAN, SCALE 1:600

FIG.3 GROUND FLOOR PLAN, SCALE 1:200

FIG.4 FIRST FLOOR PLAN, SCALE 1:200

FIG.5 SECOND FLOOR PLAN, SCALE 1:200

FIG.6 ELEVATION, SCALE 1:200

FIG.7 SECTION, SCALE 1:200

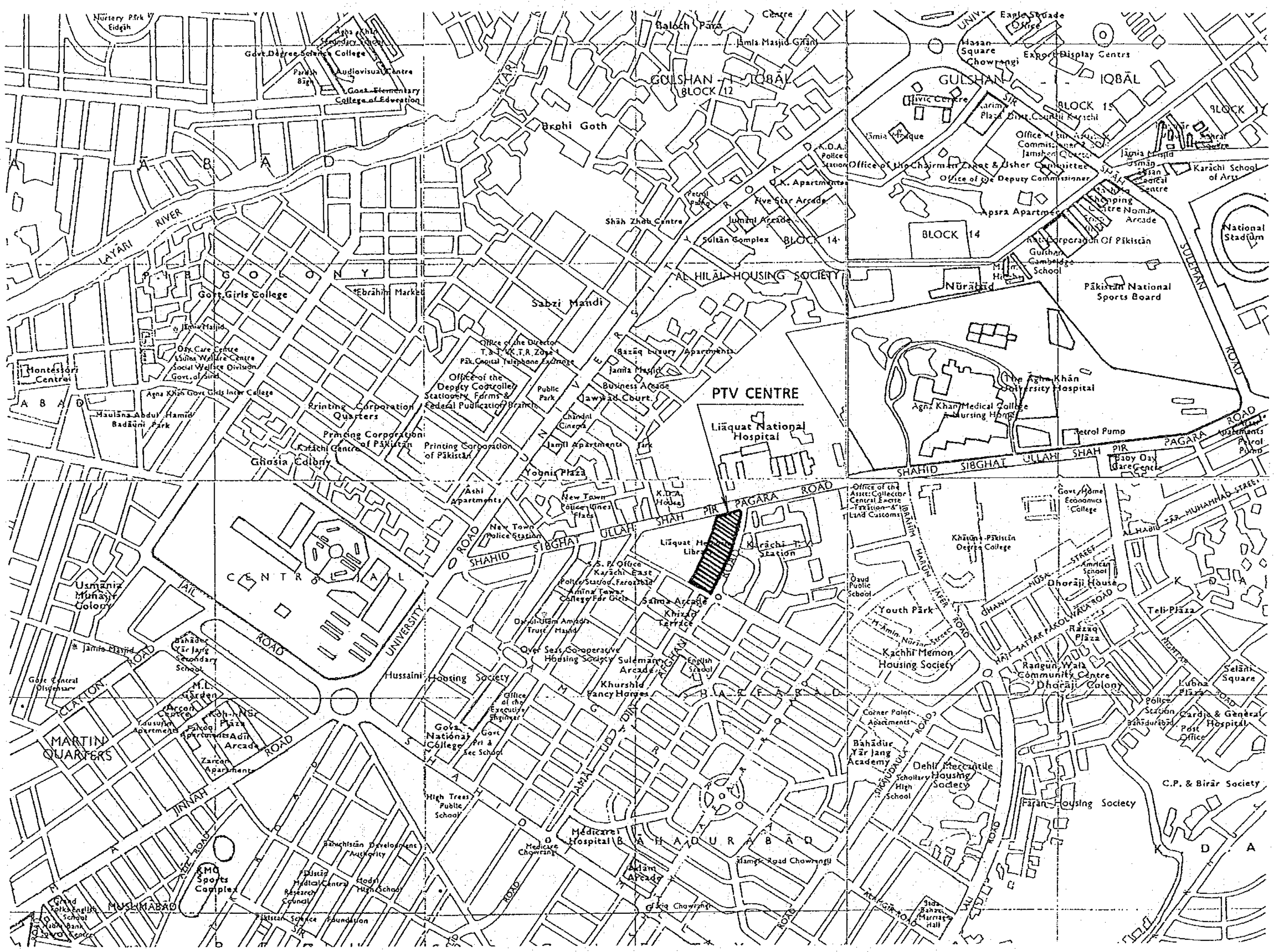
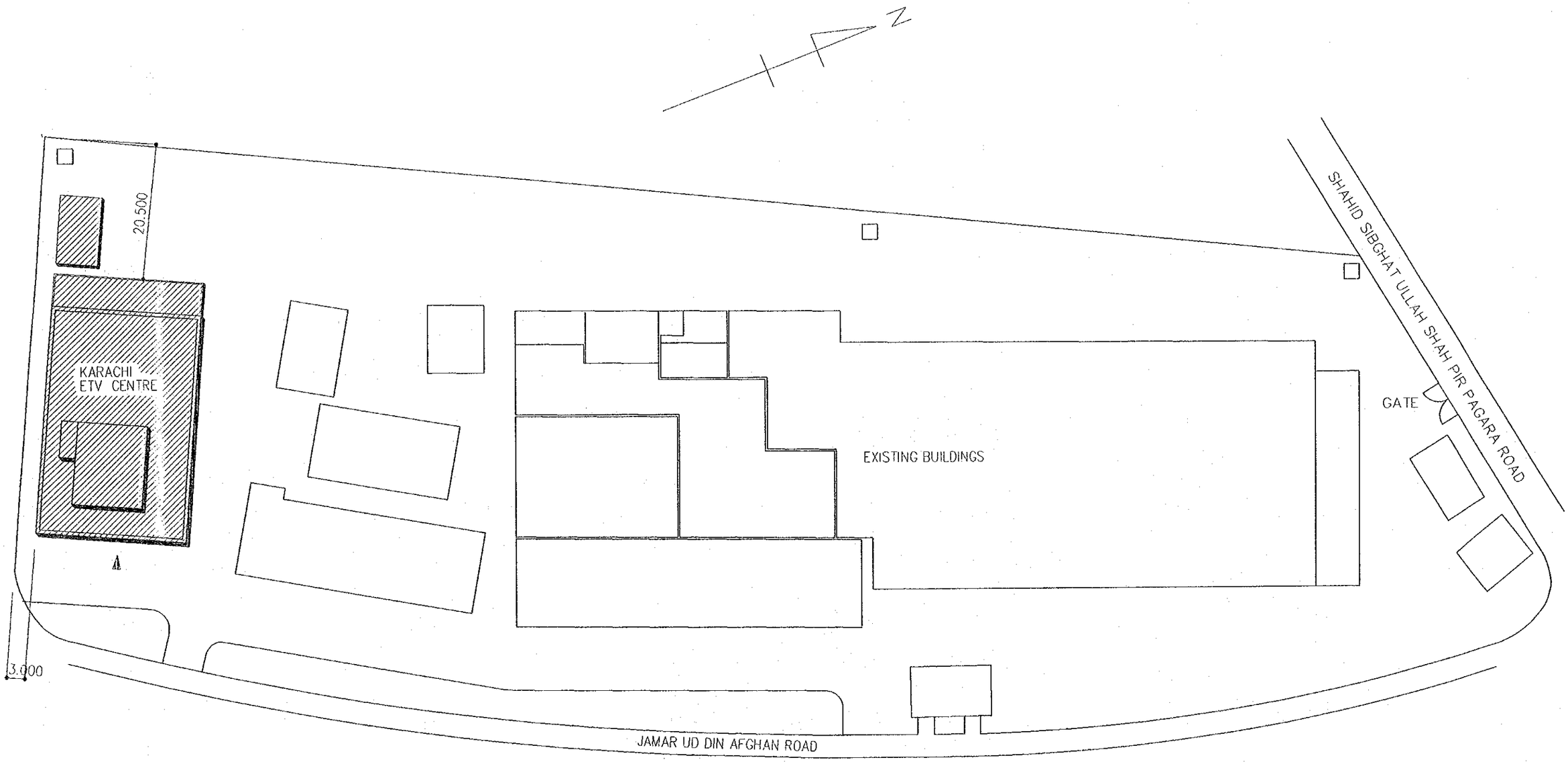
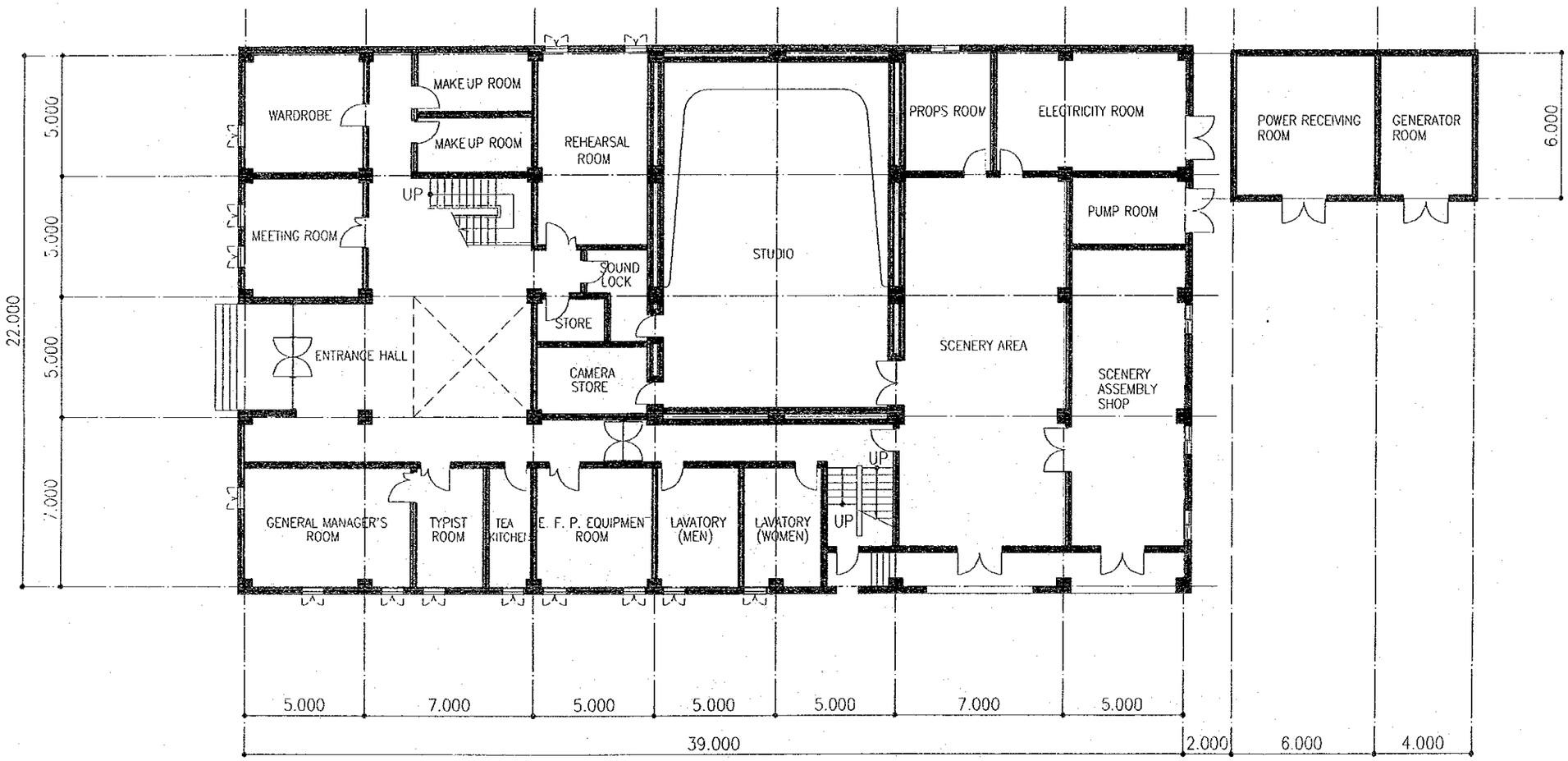


FIG.1 LOCATION OF KARACHI PTV CENTRE



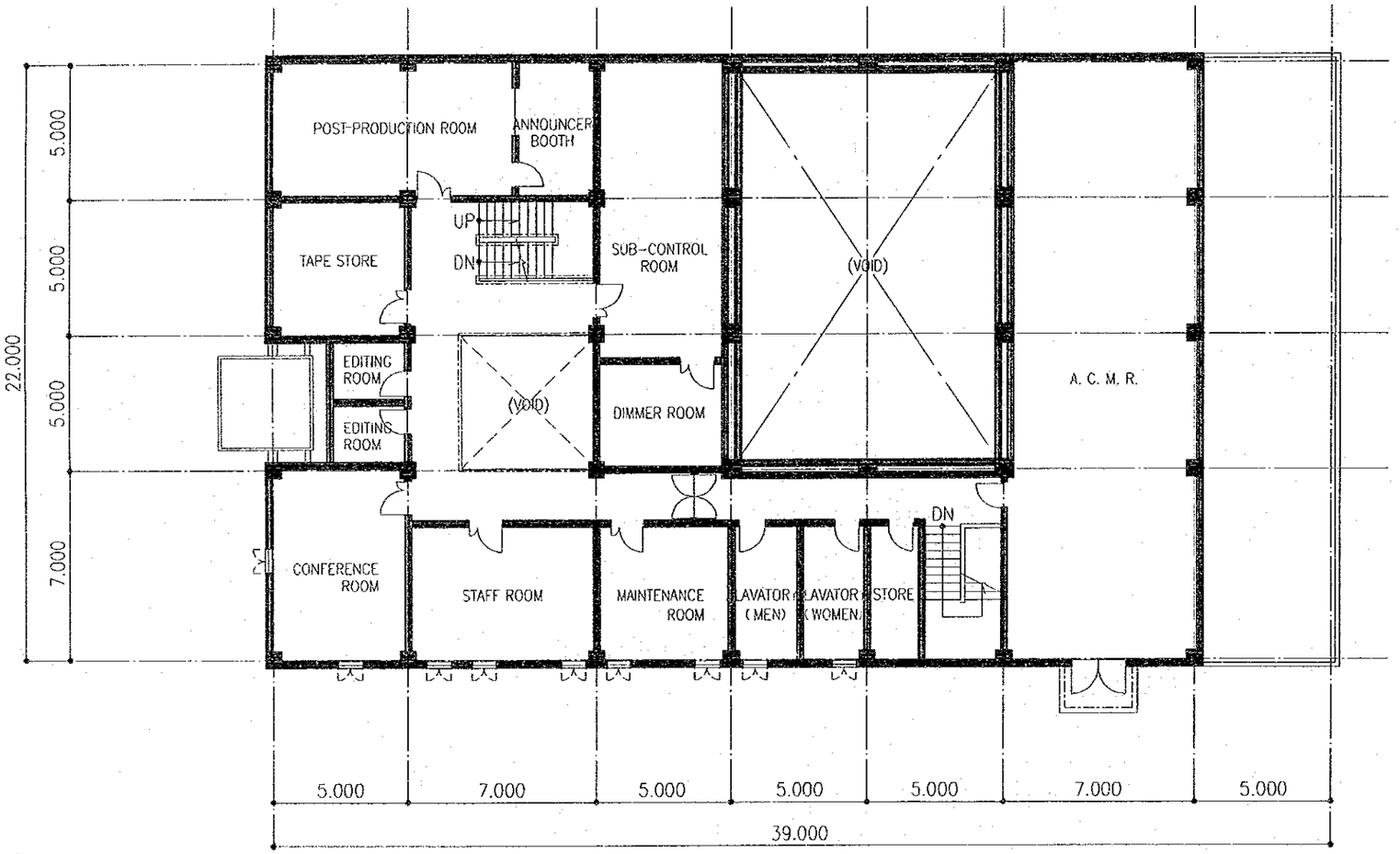
SCALE 1 : 600

FIG.2 SITE LAYOUT PLAN



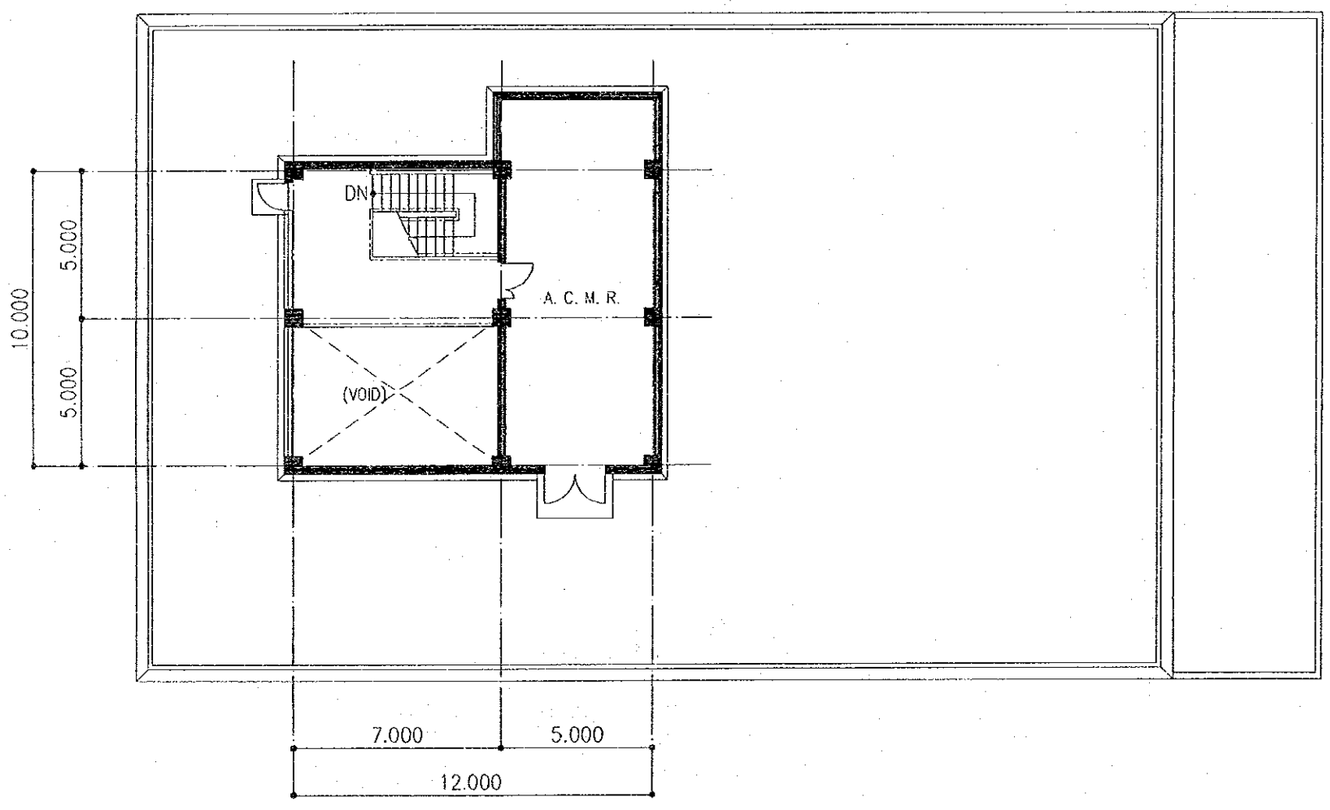
SCALE 1 : 200

FIG.3 GROUND FLOOR PLAN



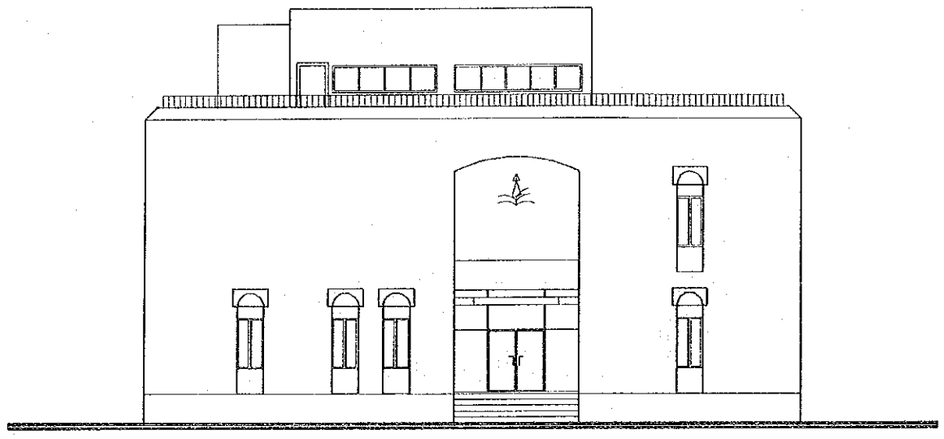
SCALE 1 : 200

FIG.4 FIRST FLOOR PLAN

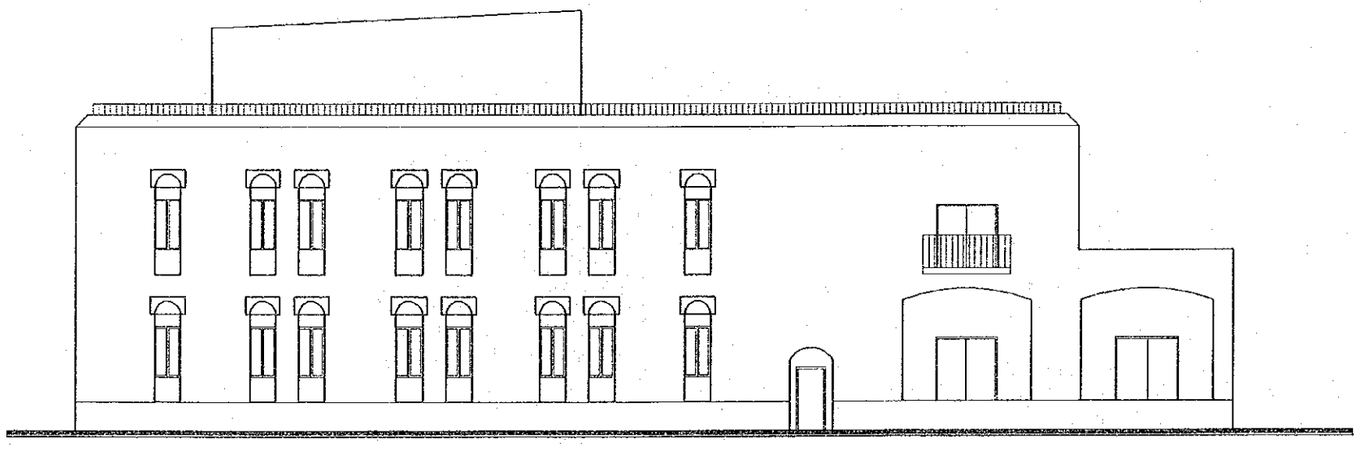


SCALE 1 : 200

FIG.5 SECOND FLOOR PLAN



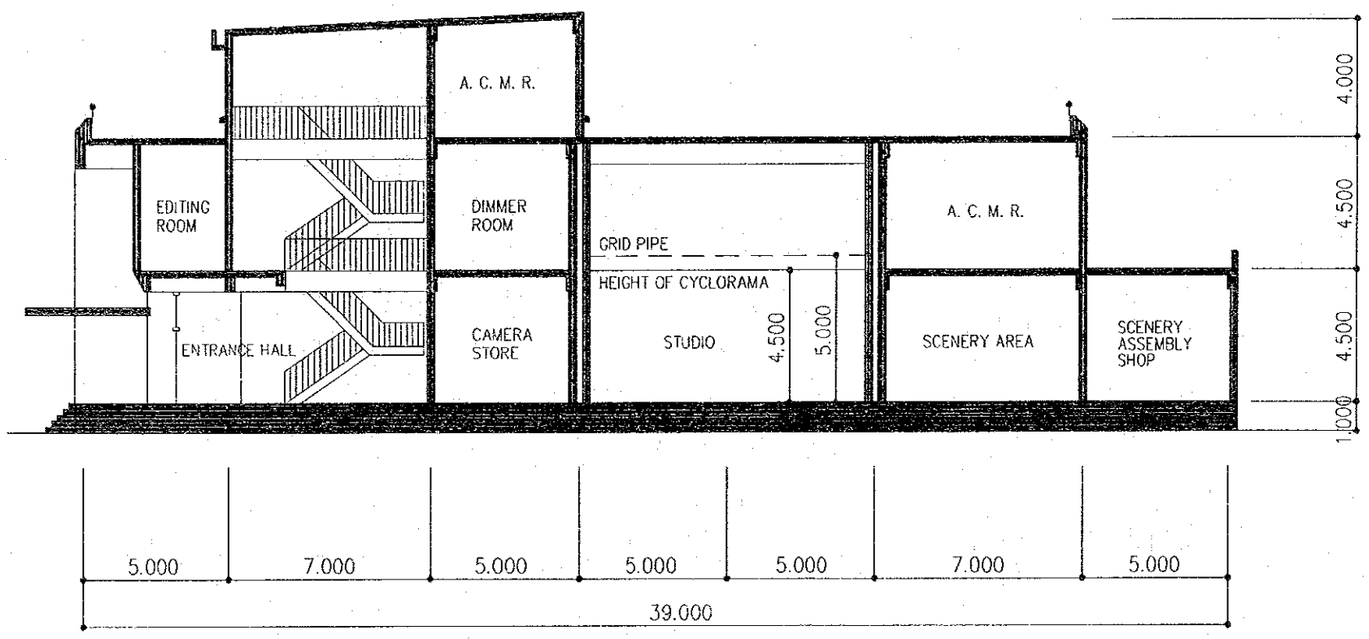
EAST ELEVATION



NORTH ELEVATION

SCALE 1 : 200

FIG.6 ELEVATION



SCALE 1 : 200

FIG.7 SECTION

5.13 List of Data Collected

- ECONOMIC SURVEY 1993-94 (Government of Pakistan, Finance Division)
- ANNUAL BUDGET STATEMENT 1994-95 (Government of Pakistan, Finance Division)
- FEDERAL BUDGET IN BRIEF 1994-95 (Government of Pakistan, Finance Division)
- ESTIMATES OF FOREIGN ASSISTANCE 1994-95 (Government of Pakistan, Finance Division)
- EXPLANATORY MEMORANDUM ON FEDERAL RECEIPTS 1994-95 (Pakistan Water and Power Development Authority, Finance Division)
- BUDGET SPEECH OF MAKHDOOM SHAHAB-UD-DIN (Government of Pakistan, Finance Division)
- IN THE NINE HIGH-POPULATION COUNTRIES (UNESCO)
- DEMANDS FOR GRANTS AND APPROPRIATIONS 1994-95 (Government of Pakistan, Finance Division)
- SCHEMES APPROVED 1994 APRIL (Government of Pakistan, Planning Commission)
- THE PROJECT APPRAISAL MANAGEMENT AND CONTROL SYSTEM IN PAKISTAN (Sqiyeda Zia Al-Jalaly)
- EIGHTH FIVE YEAR PLAN 1993-98 (Government of Pakistan, Planning Commission)
- BUDGET 1993-94 (Pakistan Television Corporation Ltd.)
- WAPDA ANNUAL REPORT 1992-93 (Pakistan Water and Power Development Authority, Finance Division)
- NATIONAL EDUCATION POLICY 1992-2002 (Ministry of Education)
- FEDERAL GOVERNMENT PUBLIC SECTOR DEVELOPMENT PROGRAMME 1994-95 (Government of Pakistan, Planning Commission)