

## **Chapter 2**

### **Contents of the Project**

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### **2-1     Basic Concept of the Project**

#### **2-1-1     Primary Goal and Project Objectives**

The Government of Ethiopia is currently promoting the decentralization of administrative power to Region and Woreda authorities under the existing federal system. In decentralization of the educational administration, the Government of Ethiopia is struggling for the dissemination of distance education on a national scale in order to increase access to education opportunities in the regions and to improve quality, quantity and efficiency of education. On this account, the Government of Ethiopia has instituted a plan to improve radio and TV studios inside the EMA (central) and Regional Education Bureaus at ten (10) sites in total, where it is planned to produce and broadcast educational programs in local languages used in each region. This Project intends to procure radio and TV program production equipment to the above mentioned radio and TV studios in order to produce educational programs.

The primary goal of the Project is to contribute to achieve the long-term goal of Universal Primary Education by the year 2015 through distance education.

JICA carried out a Basic Design Study in July 2001 on the Project for Consolidation of Educational Television and Radio Recording Studios and completed the provision of equipment in March 2003 by Japan's grant aid as the Project (Phase I) for the three (3) sites where the works to be undertaken by the Ethiopian side for implementing the Project had been completed (it was confirmed that the studio buildings of the three (3) sites had been completed and the equipment procured under the grant aid could be installed, and moreover the broadcasting means to broadcast produced programs were ensured).

The objective of the Project is, following the Project (Phase I), to procure the radio and TV program production equipment to remaining 7 radio and TV studios prepared by each Regional Education Bureau and enable it to produce and broadcast the educational programs in the region's individual way.

## **2-1-2 Outline of the Project**

In order to achieve the above-mentioned objectives, this Project intends to carry out the following inputs and activities:

### **【Inputs】**

Japanese Side:

#### **[ Equipment ]**

- Radio program production equipment (Addis Ababa, Semera, Harar in Oromia, Dire Dawa, Mizan Teferi and Harar in Harari Radio Studios)
- TV program production equipment (Mekelle TV Studio)

Ethiopian Side:

#### **[ Facilities ]**

- Preparation of Radio Studio Building at 6 sites (Addis Ababa, Semera, Harar in Oromia, Mizan Teferi, Dire Dawa, Harar in Harari)
- Preparation of TV Studio Building at Mekelle site
- Securing of Radio transmitting facilities to broadcast programs produced at each radio studio
- Securing of TV transmitting facilities to broadcast TV programs produced at Mekelle TV studio

#### **[ Personnel ]**

- Engineers & Technicians for operation and maintenance of Radio program production equipment
- Engineers & Technicians for operation and maintenance of TV program production equipment
- Radio program producers
- TV program producers

### **【Activities】**

- (1) To consolidate Radio and TV program production and broadcasting systems at each Regional Education Bureau.

To make a basic design through the study of optimum contents and scale of the Project.

- (2) To employ engineers/technicians and maintenance staff.  
To train engineers/technicians and maintenance staff.  
To allocate funds for operation and maintenance of equipment.
- (3) To employ program production staff.  
To train program production staff.  
To allocate funds for program production.

The following outputs are expected to obtain through above Inputs and Activities.

**【Outputs】**

- (1) Environment (facilities) necessary for producing and broadcasting educational programs will be improved at the regional level (Regional Education Bureaus) following the central level (EMA).
- (2) Capabilities of the program production staff and engineers/technicians at each Regional Education Bureau will be enhanced.
- (3) More programs will be produced in local languages at the respective Regional Education Bureaus.

## **2-2 Basic Design of the Requested Japanese Assistance**

### **2-2-1 Design Policy**

The Basic Design Study conducted in July 2001 made clear necessity and appropriateness of the Project for ten (10) proposed project sites (consisting of eight (8) radio studios and two (2) TV studios), and concluded that all the ten (10) project sites be included in the scope of cooperation. However, the Project was implemented at only 3 sites by Japan's grant aid as the first phase where the works for implementing the Project to be taken by the Ethiopian side had been completed until the time of explanation of draft basic design in October, 2001. The Project (Phase I) for the 3 sites was completed on March, 2003.

Through the Implementation Review Study, it was reconfirmed that the current Education and Training policy in Ethiopia to increase access to education opportunities, and to improve quality, quantity and efficiency of education by producing and broadcasting region's own educational radio and TV programs in local languages that incorporate region's own cultures and customs and the circumstances such as socio-economic situation in Ethiopia which will affect to implement the Project remained unchanged. Each region has a plan to produce and broadcast some 200 educational programs a year under the current situation. However, there was no significant change observed in improvement of their program production equipment from the time of the Basic Design Study through this Implementation Review Study time. Therefore, it is concluded necessary and appropriate to improve program production equipment for remaining seven (7) sites following the Project (Phase I).

#### **(1) Basic Policies on Site Selection**

As mentioned above, necessity and appropriateness of the Project are confirmed.

The following conditions for the implementation of the Project were confirmed between the Ethiopian and Japanese sides at the Basic Design Study.

Ethiopian side should carry out:

- preparation of studio building in which the equipment procured under the Project is to be installed.

- securing of broadcast means to broadcast produced programs

Pursuant to this arrangement, site surveys were conducted to confirm the following four (4) conditions to determine the feasibility of the Project at each of 7 sites.

- Preparation of studio building (both of exterior and interior).

- Floor Space for installation of the equipment to be procured under the Project.

- Broadcasting method of produced programs produced.

Broadcasting hours (broadcast slots within school hours).

Concerning the preparation of radio studios, some changes from the plan of the Basic Design Study have been observed in the following three (3) sites:

Site	Plan of the Basic Design Study	Changes
Addis Ababa Radio Studio (Addis Ababa special ward)	Modify an existing three-story reinforced concrete building used for primary school in Addis Ababa as radio studio building.	For structural defect found on foundation, cancel the modification of the existing school building and instead construct a new radio studio building of the EMA standard design inside the Entoto vocational school compound.
Mizan Teferi Radio Studio (SNNP Region)	Modify three (3) rooms of the existing building in the Bench Maji Zone Education Desk as radio studio building.	Change to other three (3) rooms in the same building to be modified for a radio studio.
Harar in Oromia Radio Studio (Oromia Region)	Construct a new radio studio building of the EMA standard design on a land lot (2,196m <sup>2</sup> of eucalyptus tree field) near the Alemaya transmitting station.	As the location of the planned site is inconvenient for program production activities, cancel the new construction and instead modify the existing building as radio studio building better located in Harar City of Oromia Region (change the name from Alemaya to Harar in Oromia radio studio accordingly).

## (2) Equipment for Cooperation

The equipment to be procured to each studio site shall remain the same in contents and specification as planned in the Basic Design Study.

### 2-2-1-1 Current State of Project Site (Situations of Studio Buildings)

#### (1) Addis Ababa Education Bureau Addis Ababa Radio Studio

1) Location of Site      Latitude:9°03'06"N, Longitude 38°45'58"E, Altitude: 2,510m

#### 2) Situation of Radio Studio Building

##### [ Radio Studio Building ]

A new radio studio building conforming to the EMA standard design (brick construction with cement plastering) has been constructed.

The interior and exterior of the building are finished up in high quality and no defect such as rainwater leaking, which must affect the installed equipment if any, is found.

The building consists of radio studio floor, control room, editing room, maintenance room, staff room, and so on.

There are two (2) radio studios (consisting of studio floor and control room) prepared being different from the EMA standard design.

#### [ Floor Space for Equipment Installation ]

##### (Radio Studio Floor)

The radio studio floor has a space of about  $26\text{m}^2$  ( $6.2\text{m} \times 4.3\text{m}$ ) that reserves a sufficient space as a radio program production floor. Also, the sound insulation between the studio floor and control room as well as the acoustic characteristics has been properly fitted up conforming to the EMA standard design.

##### (Control Room)

The control room has a space of about  $20\text{m}^2$  ( $4.7\text{m} \times 4.2\text{m}$ ) that reserves a sufficient space to install the equipment planned in the Basic Design Study. Also, the room is finished up with the interior taking into account the acoustic characteristics of the room.

##### (Editing Room)

The editing room has to take an L-shaped floor plan being different from the EMA standard design, for the building prepares two (2) radio studios. The room has a space of about  $24\text{m}^2$  that reserves a sufficient space to install a CD editor and a CD duplicator.

##### (Maintenance Room)

The maintenance room is finished up accurately conforming to the EMA standard design.

The room has a space of about  $40\text{m}^2$  ( $4.7\text{m} \times 8.4\text{m}$ ) that reserves an ample space as a maintenance room to install a 2kVA AVR for the measuring equipment and devices and to carry out the maintenance work.

Refer to Fig. 2-2-3 Floor Layout of Addis Ababa Radio Studio.

#### [ Environmental Condition ]

The site survey was carried out in early June, the hottest season near to the end of dry season in Ethiopia. Air temperature was measured  $24^\circ\text{C}$  outdoor against  $22^\circ\text{C}$  in the studio floor as well as in the control room. Humidity is low and it provides a comfortable work environment for program production.

### [ Others ]

According to the Basic Design Study, it was planned to modify a closed primary school building to a radio studio building. However, for structural defect found on foundation of the building, the modification work was abandoned and instead a new radio studio construction plan was adopted. The new studio has been constructed on a plot prepared inside the Entoto vocational high school compound situated about 10 minutes drive from EMA.

An access road up to the entrance of the studio building has been prepared, so there is no problem in carrying in the equipment. At the time of the site survey, the electricity of the studio building was still supplied from a temporary source used in construction but a permanent supply is scheduled available by the time of the installation work of equipment.

### (2) Afar Regional Education Bureau Semera Radio Studio

1) Location of Site      Latitude: 11°48'00"N,    Longitude: 41°00'10"E,    Altitude: 442m.

### 2) Situation of Radio Studio Building

#### [ Radio Studio Building ]

A new radio studio building conforming to the EMA standard design (brick construction with cement plastering) has been constructed.

The interior and exterior of the building are finished up in high quality and no defect such as rainwater leaking, which must affect the installed equipment if any, is found.

The building consists of radio studio floor, control room, editing room, maintenance room, staff room, etc.

#### [ Floor Space for Equipment Installation ]

##### (Radio Studio Floor)

The radio studio floor has a space of about 23m<sup>2</sup> (6.1m × 3.7m) that reserves a sufficient space as a radio program production floor. Also, the soundproof as well as the acoustic characteristics of the studio floor has been properly fitted up conforming to the EMA standard design.

##### (Control Room)

The control room has a space of about 16m<sup>2</sup> (4.4m × 3.6m) that reserves a sufficient space to install the equipment planned in the Basic Design Study. Also, the room is finished up with the interior taking into account the acoustic



characteristic of the room.

(Editing Room)

The editing room is finished up accurately conforming to the EMA standard design.

The room has a space of about 19.5m<sup>2</sup> (5.0m × 3.9m) that reserves a sufficient space to install a CD editor and a CD duplicator.

(Maintenance Room)

The maintenance room is finished up accurately conforming to the EMA standard design. The room has a space of about 40m<sup>2</sup> (4.9m × 8.1m) that reserves an ample space as a maintenance room to install a 2kVA AVR for the measuring equipment and devices and to carry out the maintenance work.

Refer to Fig. 2-2-4 Floor Layout of Semera Radio Studio.

[ Environmental Condition ]

Semera is a place of the intense heat, where air temperature exceeds 50 °C at the highest in daytime and might not fall below 30 °C throughout a day. Air temperature was measured 48 °C outdoor against 40 °C in the studio floor as well as in the control room. (The temperature was measured at around 11:00 a.m. but not at the time of the highest.) Though humidity is low, the work environment is very bad for both personnel and equipment, therefore air conditioning facilities are indispensable.

At the time of the site survey, it was observed that each room, except the studio floor and the control room, was equipped with a window type air conditioner by the Afar regional government, and soundproof separate type air conditioners are process of procurement for the studio floor and the control room by Afar REB.

[ Others ]

A radio studio building has been constructed on a plot of an area of 10,000m<sup>2</sup> (100m × 100m) prepared inside the Semera designated development area. The site is in the desert about 1.0 km off the Djibouti-Addis Ababa highway. There is no good road to connect from highway to the studio building, but no problem in access to the studio building is expected.

The site is situated about 800 km northeast of Addis Ababa and no airport lies in the vicinity, so that vehicles are the only traveling means from Addis Ababa to the site (about 2 days drive).

(3) Oromia Regional Education Bureau (East Hararege Zone Education Desk)

Harar in Oromia Radio Studio

1) Location of Site      Latitude: 09°18'58"N,   Longitude: 42°07'18"E,   Altitude: 1,913m

2) Situation of Radio Studio Building

[ Radio Studio Building ]

An existing building (built with brick and cement plastering) has been modified as a radio studio building. The modification work of the building for both the interior and exterior has been completed. There is no stain of rainwater leaking found on the building, therefore no difficulty is expected in the installation of the equipment.

The building consists of radio studio floor, control room, editing room, maintenance room, staff room, etc. The control room and the studio floor are improved on the model of the EMA standard design specification.

[ Floor Space for Equipment Installation ]

(Radio Studio Floor)

The radio studio floor has a space of about  $15\text{m}^2$  ( $4.5\text{m} \times 3.4\text{m}$ ) that is a little smaller than the space specified in the EMA standard design, but it retains a minimum space for the program production work.

Also, the soundproof as well as the acoustic characteristics of the studio floor has been improved on the model of the EMA standard design.

(Control Room)

The control room has a space of about  $15\text{m}^2$  ( $4.6\text{m} \times 3.4\text{m}$ ) that is a little smaller than the space specified in the EMA standard design, but it retains a minimum space to install the equipment planned in the Basic Design Study. Also, the room is improved taking into account the acoustic characteristics of the room.

(Editing Room)

The editing room has a space of about  $26\text{m}^2$  ( $4.6\text{m} \times 5.7\text{m}$ ) that reserves a sufficient space to install a CD editor and a CD duplicator.

(Maintenance Room)

The shape and the size ( $26\text{m}^2$  ( $4.6\text{m} \times 5.7\text{m}$ )) of the maintenance room are same as those of the editing room, and that reserves a sufficient space to install a 2kVA AVR and to carry out the maintenance work.

Refer to Fig. 2-2-5 Floor Layout of Harar in Oromia Radio Studio.

### [ Environmental Condition ]

For the studio building is situated on highland about 1,900m above the sea level, the heat is not felt even in May, the hottest month in a year. Air temperature was measured 27 °C outdoor against 24 °C in the studio floor as well as in the control room. Humidity is low and it provides a comfortable work environment for program production.

### [ Others ]

The existing building, in which the radio studio is placed, is a substantial building built with brick and cement plastering owned by the East Hararege Zone Education Desk of Oromia Region. The building lies about 200m east of the said education desk office. The entrance of the studio faces the road, so that is convenient to carry in the equipment.

The site is situated about 350km east of Addis Ababa. For traveling from Addis Ababa to the site, the flight is available up to Dire Dawa and from there vehicles have to use to the site about 2 hour drive.

#### (4) Dire Dawa Regional Education Bureau Dire Dawa Radio Studio

- 1) Location of Site      Latitude: 09°36'14"N, Longitude: 41°51'25", Altitude: 1,181m
- 2) Situation of Radio Studio Building

### [ Radio Studio Building ]

A new radio studio building conforming to the EMA standard design (brick construction with cement plastering) has been constructed. Each room of the radio studio building is equipped with a ceiling fan taking the climate in Dire Dawa into consideration.

The interior and exterior of the building are finished up in high quality and no defect such as rainwater leaking, which must affect the installed equipment if any, is found.

The building consists of radio studio floor, control room, editing room, maintenance room, staff room, etc.

### [ Floor Space for Equipment Installation ]

#### (Radio Studio Floor)

The radio studio floor has a space of about 23m<sup>2</sup> (6.1m × 3.7m) that reserves a sufficient space for the program production work. Also, the soundproof as well

as the acoustic characteristics of the studio floor have been properly fitted up conforming to the EMA standard design.

(Control Room)

The control room has a space of about  $16\text{m}^2$  ( $4.4\text{m} \times 3.6\text{m}$ ) that reserves a sufficient space to install the equipment planned in the Basic Design Study. Also, the interior of the room is finished up taking into account the acoustic characteristics as accurately as specified in the EMA standard design.

(Editing Room)

The editing room is finished up accurately conforming to the EMA standard design.

The editing room has a space of about  $19.5\text{m}^2$  ( $5.0\text{m} \times 3.9\text{m}$ ) that reserves a sufficient space to install a CD editor and a CD duplicator.

(Maintenance Room)

The maintenance room is finished up accurately conforming to the EMA standard design.

The room has a space of  $40\text{m}^2$  ( $4.9\text{m} \times 8.1\text{m}$ ) that reserves a sufficient space to install a 2kVA AVR and to carry out the maintenance work.

Refer to Fig. 2-2-6 Floor Layout of Dire Dawa Radio Studio.

[ Environmental Condition ]

The site survey was carried out in late May, the hottest season of a year in Dire Dawa Region. Air temperature was measured  $35^\circ\text{C}$  outdoor against  $32^\circ\text{C}$  in the studio floor as well as in the control room.

Damage will not occur on the equipment under the temperature of this degree. Though it is a little hot for a work environment to produce programs, both the studio floor and the control room are fitted up with ceiling fans. Besides, as it is scheduled to install separate type air conditioners in the next fiscal year budget (from July 2003), there is no problem expected in the work environment of the studio.

[ Others ]

A radio studio building has been constructed on a plot near the Dire Dawa airport by leveling a part of the cactus field. Also, an administration building comprising library, office rooms, etc. has been adjacently constructed, and these two buildings are connected with a connecting corridor. Besides, staff living quarters has been completed in an adjacent site.

The site is situated about 340km east of Addis Ababa. For traveling from Addis Ababa to the site, Ethiopian Airways is available, which is currently operating two (2) flights a day between Addis Ababa and Dire Dawa.

(5) SNNP Regional Education Bureau (Bench Maji Zone Education Desk)

Mizan Teferi Radio Studio

1) Location of Site      Latitude: 06°59'43"N, Longitude: 35°35'30"E, Altitude: 1,418m

2) Situation of Radio Studio Building

[ Radio Studio Building ]

Three (3) rooms of the existing office building of Bench Maji Zone Education Desk have been modified each for a radio studio floor, a control room and an editing-cum-maintenance room. The existing building, built with brick and cement plastering, has thick walls and ceilings, so that does not easily conduct outdoor air temperature. The modification work of these three rooms for both interior and exterior has been completed. The three rooms selected at the time of the Basic Design Study were changed, upon the advice of EMA, to other three rooms in the same building for the latter three were less influenced from outdoor temperature and noise.

[ Floor Space for Equipment Installation ]

(Radio Studio Floor)

The radio studio floor has a space of about 10m<sup>2</sup> (2.9m × 3.4m) that reserves only half the space specified in the EMA standard design, but it retains a minimum space for the program production work. The studio floor has been improved giving prior attention to the soundproof as well as the acoustic characteristics of the floor following the guidance of EMA.

(Control Room)

The control room has a space of about 10m<sup>2</sup> (3.2m × 3.3m) that reserves only half the space specified in the EMA standard design as well as the radio studio floor, but it retains a minimum space to install the equipment planned in the Basic Design Study. Also, the acoustic characteristic of the room is well acquired by attaching acoustical panels inside.

#### (Editing-cum-Maintenance Room)

The editing-cum-maintenance room having a space of about 9.0m<sup>2</sup> (2.3m × 3.8m) is a little small, but it retains a minimum space to install a CD editor, a CD duplicator and a maintenance desk as well as to carry out various works in the room.

Refer to Fig. 2-2-7 Floor Layout of Mizan Teferi Radio Studio.

#### [ Environmental Condition ]

The site survey was carried out in May, the hottest month of a year in Ethiopia. Air temperature was measured 29 °C in the studio floor and 28 °C in the control room against 36 °C outdoor. The room temperature is maintained lower against the outdoor temperature owing to the thick walls of the building, and that provides a comfortable work environment for program production.

#### [ Others ]

The site is situated on the west part of SNNP Region about 100km inside the border to Sudan and about 550km southwest of Addis Ababa. For traveling from Addis Ababa to the site, it takes about two (2) days by vehicle.

#### (6) Harari Regional Education Bureau Harar in Harari Radio Studio

- 1) Location of Site      Latitude: 09°18'40"N, Longitude: 42°07'41"E, Altitude: 1,903m
- 2) Situation of Radio Studio Building

#### [ Radio Studio Building ]

The existing building of Harari Regional Public Relations Bureau is now under total renovation and inside the refashioning work into a radio studio is underway. All the exterior works have been completed. The wall is thick and substantially built with brick and cement plastering, so that high soundproof effect is expected in the building. The interior works for the maintenance and program producer rooms have been completed but those for the control room, studio floor and CD editing room have not. Through experience of interior work at the time of the construction of the Harar in Oromia radio studio in Oromia Region, similar interior work is underway in both the studio floor and the control room paying due attention to the soundproof and acoustic characteristics of the rooms.

## [ Floor Space for Equipment Installation ]

### (Radio Studio Floor)

The radio studio floor has a space of about  $13.5\text{m}^2$  ( $3.0\text{m} \times 4.5\text{m}$ ) that is small compared with the space specified in the EMA standard design, but it retains a minimum space as a radio program production floor.

### (Control Room)

The control room has a space of about  $17.2\text{m}^2$  ( $4.1\text{m} \times 4.2\text{m}$ ) that reserves a sufficient space to install the equipment planned in the Basic Design Study.

### (Editing Room)

The editing room has a space of about  $6.8\text{m}^2$  ( $2.2\text{m} \times 3.1\text{m}$ ) that is rather small, but it still retains a minimum space to install a CD editor and a CD duplicator as well as to operate various works. The room is situated adjoining the entrance of the studio floor and there is an observation window on the wall between the studio floor and the editing room.

### (Maintenance Room)

The maintenance room has a space of about  $27\text{m}^2$  ( $5.4\text{m} \times 5.0\text{m}$ ) that reserves a sufficient space to provide with a power source of AVR (2kVA) and to install various measuring and testing equipment in the room.

Refer to Fig. 2-2-8 Floor Layout of Harar in Harari Radio Studio.

## [ Environmental Condition ]

The site is situated on highland about 1,900m above sea level. Even in May, the hottest month of a year in Ethiopia, air temperature was measured  $27^\circ\text{C}$  outdoor and  $28^\circ\text{C}$  in the studio floor as well as in the control room. It provides a comfortable work environment for program production.

## [ Others ]

The site is set up inside the existing building of Harari Regional Public Relations Bureau after being modified, lying 100m southeast of the Harari Regional Education Bureau office. Although the building conveniently faces the road, the studio is not affected by the external noise because it is set back far from the road.

Harari Region shares a border with Dire Dawa Region and the site is situated about 50km southeast of Dire Dawa City.

For traveling from Addis Ababa to the site, the flight is available to Dire Dawa City

and from there to the site it takes about 2.5 hours by vehicle.

(7) Tigray Regional Education Bureau Mekelle TV Studio

1) Location of Site      Latitude: 13°29'15"N, Longitude: 39°28'20"E, Altitude: 2,081m

2) Situation of TV Studio Building

[ TV Studio Building ]

The modification work of the existing radio studio (comprising a control room and a studio floor) to adapt the studio for use as a radio-cum-TV studio, as well as the other modification work of the existing audio tape library, which is next to the control room, to adapt the audio tape library for use as a video editing room (a non-linear editor, a logging system and a videotape duplicator to be installed in this room), has been completed all.

The existing radio studio building is a substantial structure having thick walls built with brick and cement plastering.

The modification work for the interior and exterior of the existing building is finished up in high quality and no stain such as of rainwater leaking is found, so that no obstacle is expected in the equipment installation work.

[ Floor Space for Equipment Installation ]

(Studio Floor)

The studio floor has a space of about 35m<sup>2</sup> (5.9m × 6.0m) that reserves a sufficient space for use as a small scale TV studio.

(Control Room)

The control room has a space of about 12m<sup>2</sup> (3.5m × 3.5m). All the equipment installed in the studio floor and the editing room will be supplied with electricity from this room. Though no TV equipment is installed in this room, the producer will supervise, from the room through the observation window, the program production work taking place in the studio floor.

(Editing Room)

The editing room has a space of about 12m<sup>2</sup> (3.5m × 3.5m) that is not so large to install the equipment and to carry out the video editing work in this room. However, the room is modified paying prior attention to the usability of the room with wall outlets and floor pits conveniently arranged. In addition, there is a



large soundproofing glass window fitted on the wall between the control room and the editing room, so as to allow observing the operations taking place in the control room and the studio floor.

Though the room is small, it retains a minimum space to install a non-linear editor, a logging system and a VHS video tape duplicator as well as to carry out various works such as editing, etc. in the room.

Refer to Fig. 2-2-9 Floor Layout of Mekelle TV Studio.

#### [ Environmental Condition ]

The site survey was carried out in late May, the hottest season in a year near to the end of dry season. The heat insulation of the building is good owing to the thick walls. Air temperature was measured 28°C in the studio floor as well as in the control room against 36°C outdoor. Humidity is low and it provides a comfortable work environment for program production.

#### [ Others ]

TV program production requires a lighting facility for camera shooting. Because the studio is a radio-cum-TV studio, the lighting facility is considered to become an obstacle against the radio program production if permanently fixed on the ceiling in the studio. Therefore, it is adopted to use a portable lighting so as to bring it into the studio when required for TV program production.

The site is situated about 600km north of Addis Ababa and about 100km inside the border to Eritrea.

For traveling from Addis Ababa to the site, Ethiopian Airways flies currently twice a day between Addis Ababa and Mekelle.

### **2-2-1-2 Broadcasting Method to Broadcast Produced Programs at each REB**

#### (1) Broadcast Method of Radio Programs

Radio programs produced for primary school pupils at each radio studio will be brought into 12 transmitting stations located throughout the country and transmitted according to the broadcasting schedule. Fig. 2-2-1 shows location map of 12 MW transmitting stations.

The present situations of each transmitting station are shown in Table 2-2-1.

Each transmitting station comprises of

10kW MW transmitter	:	1 set
1kW MW transmitter	:	1 set

100m Transmitting Antenna : 1 set

30kVA Engine Generator : 1 set

The broadcasting operation in each transmitting station is carried out by the transmitting engineers dispatched from the Regional Education Bureau in each region, staying in the station while broadcasting.

**Table 2-2-1 Status of Transmitting Stations**

Transmitting Station	Where Used	Frequency (kHz)	Output	Status of Transmitter	Year Installed
1. Mekelle <sup>*1)</sup> (Tigray Region)	Tigray REB	549	1kW	Operating well	1981
		1251	10kW	Operating well	1995
		1044	10kW	(Future plan)	—
2. Gondar (Amhara Region)	Amhara REB	630	1kW	Operating well	1997
		972	10kW	Operating well	1997
		1332	10kW	(Future plan)	—
3. Bahar Dar (Amhara Region)	Amhara REB	774	1kW	Operating well	1981
		1179	10kW	Operating well	1995
		1305	10kW	(Future plan)	—
4. Dessie (Amhara Region)	Amhara and Afar REBs	657	1kW	Operating well	1981
		1161	10kW	Operating well	1995
		1017	10kW	(Future plan)	—
5. Debre Markos (Amhara Region)	Amhara and Benishangul-Gumuz REBs	612	1kW	Operating well	1981
		1116	10kW	Operating well	1995
		927	10kW	(Future plan)	—
6. Legadadi (Oromia Region)	Oromia and Addis Ababa REBs	720	1kW	Operating well	1981
		1188	10kW	Operating well	1995
		1404	10kW	(Future plan)	—
7. Alemaya <sup>*2)</sup> (Oromia Region)	Oromia, Dire Dawa and Harari REBs	567	1kW	Operating well	1981
		1287	10kW	Out of order	1995
		1476	10kW	(Future plan)	—
8. Gimbi (Oromia Region)	Oromia and Gambella REBs	540	1kW	Operating well	1981
		1215	10kW	Operating well	1995
		1494	10kW	(Future plan)	—
9. Robe (Oromia Region)	Oromia REB	801	1kW	Operating well	1981
		1260	10kW	Operating well	1995
		1440	10kW	(Future plan)	—
10. Gore (Oromia Region)	Oromia, Gambella and SNNP REBs	756	1kW	Operating well	1981
		1143	10kW	Operating well	1995
		1422	10kW	(Future plan)	—
11. Sodo (SNNP Region)	SNNP REB	738	1kW	Operating well	1971
		1233	10kW	Operating well	1995
		918	10kW	(Future plan)	—
12. Godie <sup>*3)</sup> (Somali Region)	Somali REB	594	1kW	Operating well	2002
		855	10kW	Operating well	2002
		1062	10kW	(Future plan)	—

\*1) Mekelle Station : Was situated near Mekelle Airport but forced to move to another location due to the

- expansion of the airport. Resumed broadcasting in May, 2002 after completion of construction of new transmitting station in the suburbs of Mekelle.
- \*2) Alemaya Station : Oromia REB, Dire Dawa REB and Harari REB, which jointly operate Alemaya transmitting station, are now procuring spare parts for 10kW transmitter from the manufacturer (Harris in USA) as they have secured a fund for acquisition.
  - \*3) Godie Station : Started broadcasting on September, 2002 after completion of construction of new transmitting station.

The Gambella transmitting station, a newly established station (construction of building was completed in 1999) is currently procuring a transmitter and will start broadcasting from 2004 as the 13th transmitting station in the country.

The programs produced in the Gambella radio studio which was improved under the Project (Phase I) will be broadcasted from this Gambella transmitting station.

EMA and Regional Education Bureaus have been planning to establish their own transmitting station in each region, but that has not come about yet in the present circumstances because of the problem of frequency allocation and other reasons. This brings about a big disparity in the broadcasting capabilities among regions. Oromia Region owns five (5) transmitting stations and Amhara Region has four (4), while there is no own station in Dire Dawa, Harari, Afar and Benishangul-Gumuz Regions at present.

Because not all regions have their own transmitting station, neighboring two to three Regional Education Bureaus have made the agreement to use two transmitters in the station commonly and share the time table to broadcast their programs.

Each REB will use the following transmitting station(s) to broadcast produced programs respectively after completion of the Project.

Addis Ababa REB (Addis Ababa Radio Studio)

Legadadi MW transmitting station in Oromia Region (Common use with Oromia REB)

Afar REB (Semera Radio Studio)

Dessie MW transmitting station in Amhara Region (Common use with Amhara REB)

Mekelle MW transmitting station in Tigray Region (Common use with Tigray REB)

Oromia REB East Hararege Zone Education Desk (Harar in Oromia Radio Station)

Alemaya MW transmitting station in Oromia Region (Common use with Dire Dawa REB and Harari REB)

Dire Dawa REB (Dire Dawa Radio Studio)

Alemaya MW transmitting station in Oromia Region (Common use with Harari REB and East Hararege Zone Education Desk)

SNNP REB Bench Maji Zone Education Desk (Mizan Teferi Radio Studio)

Sodo MW transmitting station in SNNP Region (common use with SNNP REB)

Gore MW transmitting station in Oromia Region (common use with Oromia REB)

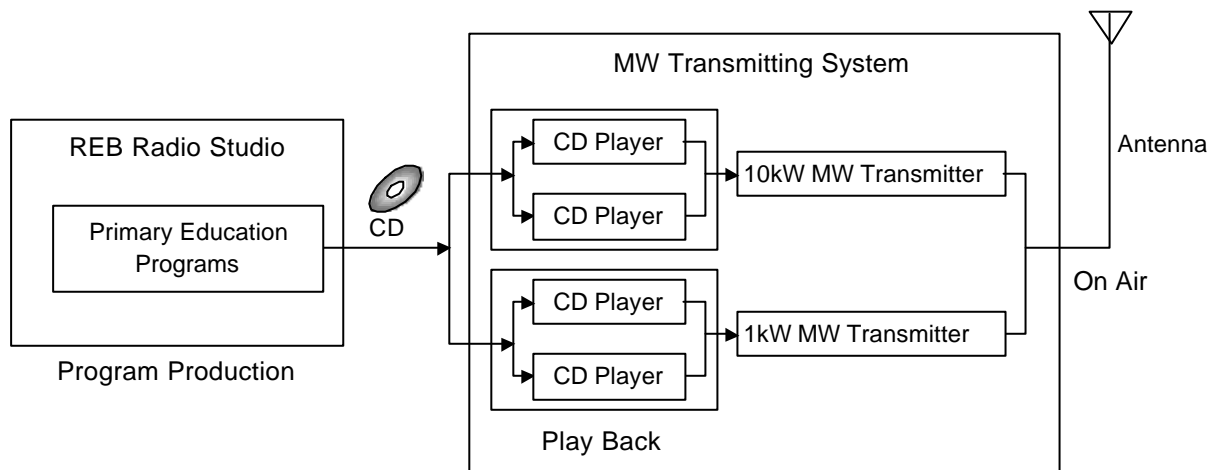
Harari REB (Harar in Harari Radio Studio)

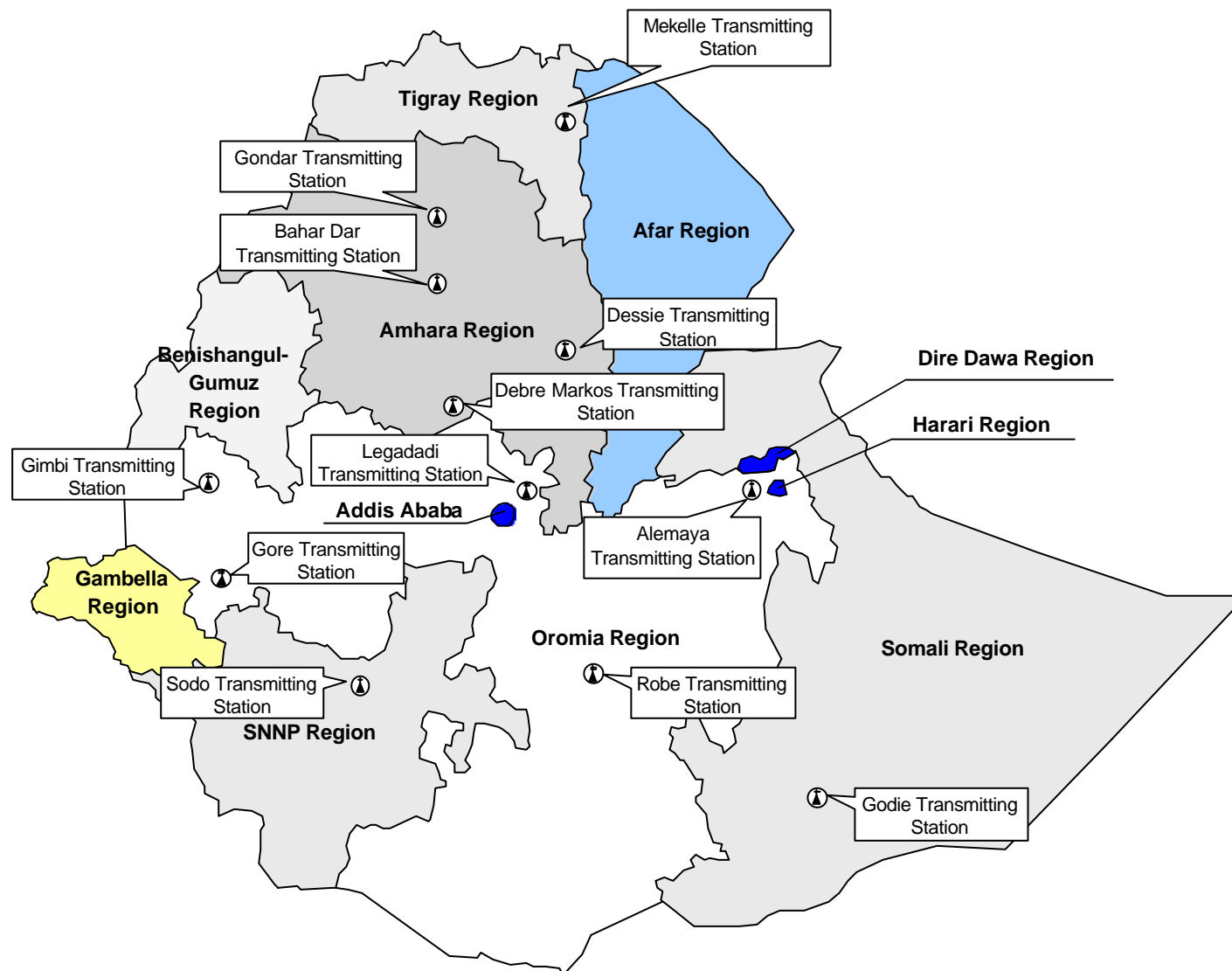
Alemaya MW transmitting station in Oromia Region (common use with Dire Dawa REB and East Hararege Zone Education Desk)

Each transmitting station is equipped with the equipment to play back the recorded educational programs brought to the station and to input signals into the transmitter.

Before implementation of the Project (Phase I), the educational programs were recorded in 6 mm tapes and carried to the transmitting station, and they had been reproduced by the open-reel tape recorders installed in the stations and then broadcasted by the transmitter.

Through the implementation of the Project (Phase I), each transmitting station was equipped with CD players to cope with the digitalization of program production equipment and the spread of CDs as a new recording medium. Therefore, the educational programs produced in the radio studios will be recorded in CDs to carry them to the transmitting station and broadcasted from there as described below.





**Fig. 2-2-1 Location Map of 12 MW Transmitting Stations**

(2) Broadcasting Hours of Radio Programs

Twelve 15-minute educational radio programs per day (60 programs per week) are broadcasted in primary school hours from 8:00 a.m. to 12:15 p.m. Monday through Friday. (refer to Table 2-2-2) As most primary schools operate in two shifts (morning and afternoon), morning programs are rebroadcasted between 12:30 and 16:45 in the afternoon.

Each transmitting station conducts two channel operation by means of one 10kW and one 1kW transmitters thus capable of broadcasting 120 programs per week (60 programs/week  $\times$  2 transmitters).

**Table 2-2-2 Radio Broadcasting Schedule for Primary School**

		Monday	Tuesday	Wednesday	Thursday	Friday
1st Shift	8:00 – 8:40	1st subject	1st subject	1st subject	1st subject	1st subject
		2nd subject	2nd subject	2nd subject	2nd subject	2nd subject
	8:40 – 9:20	3rd subject	3rd subject	3rd subject	3rd subject	3rd subject
		4th subject	4th subject	4th subject	4th subject	4th subject
	9:20 – 10:00	5th subject	5th subject	5th subject	5th subject	5th subject
		6th subject	6th subject	6th subject	6th subject	6th subject
	10:15 – 10:55	7th subject	7th subject	7th subject	7th subject	7th subject
		8th subject	8th subject	8th subject	8th subject	8th subject
	10:55 – 11:35	9th subject	9th subject	9th subject	9th subject	9th subject
		10th subject	10th subject	10th subject	10th subject	10th subject
	11:35 – 12:15	11th subject	11th subject	11th subject	11th subject	11th subject
		12th subject	12th subject	12th subject	12th subject	12th subject
Shifting Times						
		Monday	Tuesday	Wednesday	Thursday	Friday
2nd Shift	12:30 - 13:10					
	13:10 - 13:50					
	13:50 - 14:30		Rebroadcasting of morning programs			
	14:45 - 15:25					
	1:25 - 16:05					
	16:05 - 16:45					

At the transmitting station, which are jointly operated by 2 or 3 REBs, REBs share the slots to broadcast their programs.

Table 2-2-3 shows the broadcasting timetable of Alemaya transmitting station, which is jointly operated by Oromia REB, Dire Dawa REB and Harari REB by way of example.

**Table 2-2-3 Broadcasting Timetable of Alemaya Transmitting Station**

			Broadcast time	Mon	G	Tue	G	Wed	G	Thu	G	Fri	G
1	8:00 - 8:40	1	8:05-8:20	Oromo Language	1	Harari Env.Science	1	Oromo Env.Science	5	D.D Env.Science	3	Oromo Env.Science	4
		2	8:25-8:40	English	4	Oromo Science	5	Harari Language	2	Oromo Social Study	8	Harari Social Study	6
2	8:40 - 9:20	1	8:45-9:00	Oromo Biology	7	D.D Env.Science	3	Oromo Language	2	Harari Env.Science	2	Oromo Env.Science	1
		2	9:05-9:20	Harari Social Study	5	Oromo Language	3	Harari Science	6	Oromo Env.Science	6	English	2
3	9:20 - 10:00	1	9:25-9:40	Oromo Language	6	Geography	9	Oromo Social Study	7	English	5	Oromo Language	5
		2	9:45-10:00	English	8	Oromo Language	7	History	9	Oromo Env.Science	3	English	7
<b>10:00 - 10:15</b> <b>B R E A K T I M E</b>													
4	10:15 - 10:55	1	10:20-10:35	Oromo Social Study	5	D.D Science	5	Oromo Language	4	Harari Env.Science	3	Oromo Science	6
		2	10:40-10:55	English	3	Oromo Env.Science	2	D.D Social Study	5	Oromo Biology	8	English	1
5	10:55 - 11:35	1	11:00-11:15	Oromo Social Study	6	English	6	Harari Language	4	English	9	Oromo Language	3
		2	11:20-11:35	English	7	Oromo Env.Science	1	English	1	Oromo Language	2	English	4
6	10:35 - 12:15	1	11:40-11:55	Oromo Env.Science	2	Harari Language	3	Harari Science	5	D.D Science	5	Harari Env.Science	5
		2	12:00-12:15	D.D Social Study	5	Env. Science	9	Oromo Language	8	Harari Language	1	Oromo Language	1
<b>12:15 - 12:30</b> <b>E X C H A N G E T I M E</b>													
7	12:30 - 13:10	1	12:35-12:50	Oromo Language	1	Harari Env.Science	1	Oromo Env.Science	5	D.D Env.Science	3	Oromo Env.Science	4
		2	12:55-13:10	English	4	Oromo Science	5	Harari Language	2	Oromo Social Study	8	Harari Social Study	6
8	13:10 - 13:50	1	13:15-13:30	Oromo Biology	7	D.D Env.Science	3	Oromo Language	2	Harari Env.Science	2	Oromo Env.Science	1
		2	13:35-13:50	Harari Social Study	5	Oromo Language	3	Harari Science	6	Oromo Env.Science	6	English	2
9	13:50 - 14:30	1	13:55-14:10	Oromo Language	6	Geography	9	Oromo Social Study	7	English	5	Oromo Language	5
		2	14:15-14:30	English	8	Oromo Language	7	History	9	Oromo Env.Science	3	English	7
<b>14:30 - 14:45</b> <b>B R E A K T I M E</b>													
10	14:45 - 15:25	1	14:50-15:05	Oromo Social Study	5	D.D Science	5	Oromo Language	4	Harari Env.Science	3	Oromo Science	6
		2	15:10-15:25	English	3	Oromo Env.Science	2	D.D Social Study	5	Oromo Biology	8	English	1
11	15:25 - 16:05	1	15:30-15:45	Oromo Social Study	6	English	6	Harari Language	4	English	9	Oromo Language	3
		2	15:50-16:05	English	7	Oromo Env.Science	1	English	1	Oromo Language	2	English	4
12	16:05 - 16:45	1	16:10-16:25	Oromo Env.Science	2	Harari Language	3	Harari Science	5	D.D Science	5	Harari Env.Science	5
		2	16:30-16:45	D.D Social Study	5	Env. Science	9	Oromo Language	8	Harari Language	1	Oromo Language	1

D.D: programs produced at Dire Dawa REB  
Oromo: programs produced at Oromia REB  
Harari: programs produced at Harari REB

(3) Broadcasting Method of Educational TV Programs in Tigray Regional Education Bureau

Tigray Regional Education Bureau has a plan to produce and broadcast the educational TV programs in the Tigrigna language for the higher grade primary school pupils (G-7 and G-8) covering four (4) subjects namely arithmetic, physics, chemistry and biology (20 programs each of 15 minutes). However, as Tigray Regional Education Bureau does not own broadcasting facilities necessary for broadcasting produced programs, it has to rent the part of the transmitting facilities of the state-run Ethiopia Television (ETV), the only TV station in the country.

Tigray Regional Education Bureau is planning the broadcasting aiming at the region area from the ETV Mekelle TV transmitting station by renting the transmitting facilities of the station. The transmitting facilities of the ETV Mekelle TV station comprise two (2) 1kW TV transmitters: one is for regular operation and the other for emergency in an automatic switching system to maintain uninterrupted broadcasting.

The broadcasting procedure to be employed is as follows: first, produce programs and record programs in VTR tapes at the Mekelle TV studio and carry the VTR tapes to the ETV Mekelle TV transmitting station, and then at the TV transmitting station, play back the VTR tapes with the VTR player prepared by Tigray Regional Education Bureau to input to the 1kW TV transmitter. (Refer to Fig. 2-2-2 Broadcasting System of Educational TV Programs in Tigray Regional Education Bureau.)

There is no technical problem in the planned broadcasting system and the educational programs

can be broadcasted with the 1kW TV transmitter to the area covering about 90 % of the Tigray Regional territory.

Educational programs are required to be broadcasted in the school hours of primary school of 08:00 to 16:45, while the broadcasting hours of ETV on weekdays are 18:00 to 24:00. Therefore, it is possible to broadcast the educational programs to primary schools by renting the transmitting facilities of ETV for the hours which ETV does not use, excepting the hours of 11:00 to 14:00 which are already occupied by EMA for its broadcasting of educational programs for secondary school.

The broadcasting schedule of the educational programs of Tigray Regional Education Bureau is shown in Table 2-2-4.

**Table 2-2-4 Broadcasting Timetable of TV Educational Programs in Tigray REB**

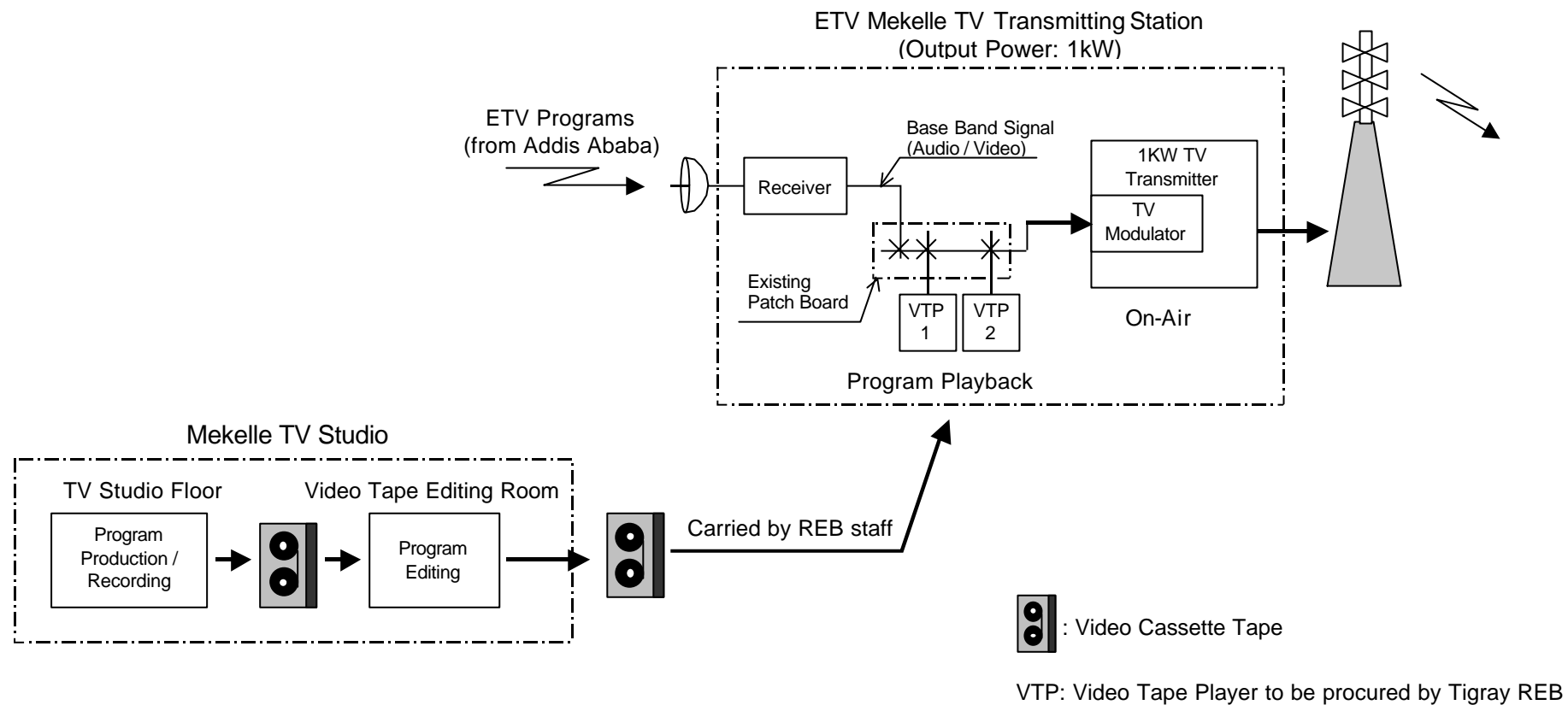
	Mon.	Tue.	Wed.	Thu.	Fri.
08 : 00 - 08 : 15	Arithmetic (G-7)	Mathematics(G-7) (R)	Mathematics(G-7) (R)	Mathematics(G-7) (R)	Mathematics(G-7) (R)
08 : 20 - 08 : 35	Biology (G-7)	Biology (G-7) (R)	Biology (G-7) (R)	Biology (G-7) (R)	Biology (G-7) (R)
08 : 40 - 08 : 55	Physics (G-7)	Physics (G-7) (R)	Physics (G-7) (R)	Physics (G-7) (R)	Physics (G-7) (R)
09 : 20 - 09 : 35	Chemistry (G-7)	Chemistry (G-7) (R)	Chemistry (G-7) (R)	Chemistry (G-7) (R)	Chemistry (G-7) (R)
09 : 40 - 09 : 55	Mathematics (G-8)	Mathematics(G-8) (R)	Mathematics(G-8) (R)	Mathematics(G-8) (R)	Mathematics(G-8) (R)
10 : 00 - 10 : 15	Biology (G-8)	Biology (G-8) (R)	Biology (G-8) (R)	Biology (G-8) (R)	Biology (G-8) (R)
10 : 20 - 10 : 35	Physics (G-8)	Physics (G-8) (R)	Physics (G-8) (R)	Physics (G-8) (R)	Physics (G-8) (R)
10 : 40 - 10 : 54	Chemistry (G-8)	Chemistry (G-8) (R)	Chemistry (G-8) (R)	Chemistry (G-8) (R)	Chemistry (G-8) (R)
14 : 05 - 14 : 20	Mathematics (G-7)	Mathematics(G-7) (R)	Mathematics(G-7) (R)	Mathematics(G-7) (R)	Mathematics(G-7) (R)
14 : 25 - 14 : 40	Biology (G-7)	Biology (G-7) (R)	Biology (G-7) (R)	Biology (G-7) (R)	Biology (G-7) (R)
14 : 45 - 15 : 00	Physics (G-7)	Physics (G-7) (R)	Physics (G-7) (R)	Physics (G-7) (R)	Physics (G-7) (R)
15 : 05 - 15 : 20	Chemistry (G-7)	Chemistry (G-7) (R)	Chemistry (G-7) (R)	Chemistry (G-7) (R)	Chemistry (G-7) (R)
15 : 25 - 15 : 40	Mathematics (G-8)	Mathematics(G-8) (R)	Mathematics(G-8) (R)	Mathematics(G-8) (R)	Mathematics(G-8) (R)
15 : 45 - 16 : 00	Biology (G-8)	Biology (G-8) (R)	Biology (G-8) (R)	Biology (G-8) (R)	Biology (G-8) (R)
16 : 05 - 16 : 20	Physics (G-8)	Physics (G-8) (R)	Physics (G-8) (R)	Physics (G-8) (R)	Physics (G-8) (R)
16 : 25 - 16 : 40	Chemistry (G-8)	Chemistry (G-8) (R)	Chemistry (G-8) (R)	Chemistry (G-8) (R)	Chemistry (G-8) (R)

(R): repeat

It is planned to broadcast five (5) hours and fifteen (15) minutes a day and the budget of 234,826 Birr (equivalent to about 3,500 thousand yen) a year is summed up for a rent of transmitting facilities.

Through the enquiry to ETV, it was confirmed that ETV had already agreed with Tigray REB to broadcast programs in the school hours from 8:00 to 17:00 expecting the hours from 11:00 to 14:00 by using the broadcasting facilities of the Mekelle TV transmitting station.





**Fig. 2-2-2 Broadcasting System of Educational TV Programs in Tigray Regional Education Bureau**

### 2-2-1-3 Sites Eligible to Implement the Project

The following four (4) items are the conditions to determine the feasibility of the Project at each of 7 project sites:

Preparation of studio building.

Floor space for installation of the equipment.

Broadcast method of produced programs

Broadcast hours (Broadcast slots within school hours).

The results of survey on four (4) items at each of 7 project sites are summarized in Table 2-2-5.

**Table 2-2-5 Summary of Project Site Conditions**

Survey Item Project Sites	Studio Building		Floor Space to Install the Equipment	Broadcast Method (Usable Transmitting Station)	Broadcast Hours (Broadcast slots in school hours)
	Exterior	Interior			
Addis Ababa Radio Studio	Complete	Complete	Secured	Legadadi MW transmitting station	08:00-17:00
Semera Radio Studio	Complete	Complete	Secured	Dessie MW transmitting station Mekelle MW transmitting station	08:00-17:00
Harar in Oromia Radio Studio	Complete	Complete	Secured	Alemaya MW transmitting station	08:00-17:00
Dire Dawa Radio Studio	Complete	Complete	Secured	Alemaya MW transmitting station	08:00-17:00
Mizan Teferi Radio Studio	Complete	Complete	Secured	Sodo MW transmitting station Gore MW transmitting station	08:00-17:00
Harar in Harari Radio Studio	Complete	On-going	Secured	Alemaya MW transmitting station	08:00-17:00
Mekelle TV Studio	Complete	Complete	Secured	ETV Mekelle TV transmitting station	08:00-17:00 (excepting EMA's broadcast hours of 11:00-14:00)

It was confirmed that the following six (6) sites, ie., Addis Ababa, Semera, Harar in Oromia, Dire Dawa, Mizan Teferi and Mekelle have satisfied all the conditions for implementation of the Project.

In the Harar in Harari radio studio, the modification work of the studio building has not been completed in part. For such situation, the governor of the region issued a document to the study team to notice that the modification work would be completed by June 30, 2003. Still it would be difficult to complete by the planned date judging from the past progress taken by the Ethiopian side and the progress inspected by the latest site survey, but expected to complete the work much early in time of the project judging from the fact that a trouble with the contractor that was a cause of delay has been

settled and from the recent progress in April and May 2003.

In the Mekelle TV studio (Tigray Region), the modification work of the studio building adding further idea on the modification plan of the Basic Design Study has been completed, that presents no problem in the installation of the equipment to be procured under the Project.

Regarding the broadcast method of TV programs to be produced at Mekelle TV studio, Tigray Regional Education Bureau plans to broadcast programs from the ETV Mekelle TV transmitting station by renting the broadcasting facilities in the school hours of primary schools. ETV agreed with Tigray Regional Education Bureau to broadcast programs in the school hours from 8:00 to 17:00 excepting the hours from 11:00 to 14:00 by using the transmitting facilities of the Mekelle TV transmitting station. From the results of the technical survey at the ETV head office and the Mekelle TV transmitting station, it was confirmed that the above-mentioned broadcasting plan is practicable with no technical problem. Also, the rent of about 230,000 Birr/year (equivalent to some 3,500 thousand Yen/year) for transmitting facilities is an amount expendable enough from the annual budget of Tigray Regional Education Bureau (about 72,000 thousand Birr).

The result of the site survey reveals that all the project sites investigated have been well prepared for implementation of the Project.

#### **2-2-1-4 Program Production Plan at Each Studio after the Project Implementation**

After implementation of the Project, each Regional Education Bureau will produce educational programs as follows:

##### **(1) Addis Ababa Education Bureau (Addis Ababa Radio Studio)**

###### **Primary School (G-1 to G-4)**

- Subjects
  - English (15 min.) : 28 programs
  - Amharic (15 min.) : 28 programs
  - Environmental science (15 min.) : 28 programs (Amharic)

###### **Primary School (G-5 to G-8)**

- Subjects
  - English (15 min.) : 28 programs
  - Amharic (15 min.) : 28 programs
  - Science (15 min.) : 28 programs (Amharic)
  - Social studies (15 min.) : 28 programs (Amharic)

- Production schedule: programs for two grades to be produced per year  
(4 subjects  $\times$  28  $\times$  2 grades = 224 programs/year)

For the General Public (Saturdays and Sundays)

Current topics (15 min.)	: 226 programs (Amharic)
Technological innovation (15 min.)	: 226 programs (Amharic)
Social issues (15 min.)	: 226 programs (Amharic)
Gender issues (15 min.)	: 226 programs (Amharic)

- Production schedule: 226 programs (4 subjects) to be produced per year

(2) Afar Regional Education Bureau (Semera Radio Studio)

Primary School (G-1 to G-6)

- Subjects
 

Afaregna (15 min.)	: 24 programs
Amharic (15 min.)	: 24 programs
Science (15 min.)	: 24 programs (in Afaregna)
Social studies (15 min.)	: 24 programs (in Afaregna)
English (15 min.)	: 24 programs

Primary Schools (G-7 and G-8)

- Subjects
 

Afaregna (15 min.)	: 24 programs
Amharic (15 min.)	: 24 programs
Social studies (15 min.)	: 24 programs (in Afaregna)
Biology (15 min.)	: 24 programs (in Afaregna)
Chemistry (15 min.)	: 24 programs (in Afaregna)
- Production schedule: programs for two grades to be produced per year  
(5 subjects  $\times$  24  $\times$  2 grades = 240 programs/year)

(3) Oromia Regional Education Bureau

East Hararege Zone Education Desk (Harar in Oromia Radio Studio)

Primary school (G-1 to G-4)



- Production schedule: programs for two grades to be produced per year  
(6 subjects  $\times$  28  $\times$  2 grades = 336 programs/year)

(5) SNNP Regional Education Bureau

Bench Maji Zone Education Desk (Mizan Teferi Radio Studio)

Primary School (G-1 to G-6)

Languages: Kafa, Maji, Bench, Shaka

- Subjects
 

Environmental science (15 min.)	: 28 programs
Science (15 min.)	: 28 programs
Social studies (15 min.)	: 28 programs
- Production schedule: programs for one grade to be produced per year  
(3 subjects  $\times$  28  $\times$  4 languages  $\times$  1 grade = 336 programs/year)  
(Biology will be added in the future.)

(6) Harari Regional Education Bureau (Harar Radio Studio)

Primary school (G-1 to G-4)

- Subjects
 

Hararli language (15 min.)	: 28 programs
Environmental science (15 min.)	: 28 programs (in Hararli)
Social studies (15 min.)	: 28 programs (in Hararli)

Primary school (G-5 to G-8)

- Subjects
 

Hararli language (15 min.)	: 28 programs
Science (15 min.)	: 28 programs (in Hararli)
Social studies (15 min.)	: 28 programs (in Hararli)
- Production schedule: programs for two grades to be produced per year  
(3 subjects  $\times$  28  $\times$  2 grades = 168 programs/year)

General Public (Saturdays and Sundays)

- Subjects
 

Health (15 min.)	: 52 programs
------------------	---------------

Gender issues (15 min.) : 52 programs

Current topics (15 min.) : 52 programs

- Production schedule: 78 programs (3 subjects) to be produced per year (156 in 2 years)

(7) Tigray Regional Education Bureau (Mekelle TV Studio)

Primary School (G7, G8)

Languages: Tigray

- Subjects

Arithmetic (15 min.) : 20 programs

Biology (15 min.) : 20 programs

Physics (15 min.) : 20 programs

Chemistry (15 min.) : 20 programs

### **2-2-1-5 Basic Policies on the Selection of Equipment**

As necessity, effects, and technical and economic appropriateness of the Project were confirmed at the time of the Basic Design Study, the major purpose of this Implementation Review Study is to check and review the results of the Project (Phase I) completed in March, 2003 in order to design properly with precision in contents, scale and cost for a rewarding cooperation by making good use of the experience of the Project (Phase I).

In view of this, the study will examine the need for reviewing the contents of the Project (about specifications and functions of equipment) planned at the Basic Design Study, because the necessity of review may arise from possible changes in various conditions in Ethiopia such as in social condition, broadcast environment, renewal and procurement status of equipment, status of related projects by other donors and so on. If needs arise, the study will review the contents of the Project and prepare a more appropriate plan in accordance with the changes.

In addition, the implementation results of the Project (Phase I) will be carefully studied to clarify the issues lurking in the implementation organization and system of the Ethiopian side. In consequence, if there are problems found as serious as affecting the Project, the study will review the plan and prepare a more appropriate revised plan to cope with the issues.

(1) Policy of Contents and Scale of Equipment

The following conditions in relation with the implementation of the Project were confirmed

through the Implementation Review Study.

- Socio-economic and educational situations in Ethiopia that will affect the Project have not been changed since the time of the Basic Design Study.
- The number of programs produced after the implementation of the Project and broadcast target (primary school pupils) of programs in each REB remain the same as the Basic Design Study.
- All studio buildings are well prepared by the Ethiopian side and are adequate for the installation of the equipment planned at the Basic Design Study.
- The level of equipment procured under the Project (Phase I) is judged to be suitable for the technical level of Ethiopian engineers, because the equipment under the Project (Phase I) to both EMA radio/TV studios and the Gambella radio studio have been efficiently operated.

In view of the above conditions, it is concluded that the equipment to be procured under the Project should be, in principle, the same contents and scale as planned in the Project (Phase I).

## (2) Guidelines for Selecting Equipment

### 1) Selection of the digital equipment

Most manufacturers in the world have changed to produce program production equipment from the analog equipment to the digital equipment along with the progress of the digital technology.

Thus, the digital equipment will mostly be procured in the same way as the Project (Phase I).

### 2) Selection of audio recording media

As concerns the distribution of compact disks (CDs) in Ethiopia, the number of CD distributors has increased to facilitate the availability of CDs in the country since the time of the Basic Design Study. It was also confirmed that the price of CDs went down in the country from 40 Birr/CD priced at the time of the Basic Design Study to current 25 Birr/CD. In the circumstances, it is proposed to use CDs as an audio recording medium for the Project as in the Project (Phase I).

### 3) Equipment grade

As digital technology advances, professional type equipment have now the performance comparable to that of broadcast type equipment commonly used in broadcasting stations for



program production. In fact, some program production companies and provincial FM, and community broadcasting stations in Japan are using professional type equipment for program production.

Professional type equipment will be procured in the same way as the Project (Phase I) taking it into consideration that an objective is to produce school broadcast programs.

### (3) Policies on Equipment Procurement

#### 1) Procurement of the Equipment

Eligible countries for supply of equipment are, as a rule, limited to Japan or the recipient country in Japan's grant aid. However, Radio/TV program production equipment, which is composed of state-of-the-art electronic components, is not produced in Ethiopia.

All of the equipment for EMA Radio/TV studios and Gambella Radio Studio procured under the Project (phase I) were made in Japan.

In the light of their performance stability, reliability, certainty of supply, and follow-up setup (in particular, spare parts supply is guaranteed for 10 years in the case of Japanese equipment), it is considered best that all the equipment shall be procured from Japan the same as the Project (Phase I).

#### 2) Present Situation of Agents

The following distributors are dealing with spare parts of Japanese products in Addis Ababa.

- Glorius PTV Co. (SONY Agent)
- Trade & Development Service International PLC (SONY Agent)
- Axis International
- Advanced Semiconductor (Europe) LTD
- Beta Electrical Control and Service Engineering

In addition to the above agents, Panasonic Marketing Middle East FZE (UAE, Dubai) is supporting the operation and maintenance of the equipment procured under the Project (Phase I).

### (4) Policies on Infrastructure

As a result of voltage fluctuation measured at each project site, big voltage fluctuation was observed the same as the result at the time of the Basic Design Study.

To protect radio and TV program production equipment from the voltage fluctuation, automatic

voltage regulators (AVR) need to be installed.

On equipment such as CD editors, non-linear editors, etc. that has built-in computers, uninterrupted power supply (UPS) will be installed individually to protect stored data during a power failure.

(5) Policies on Natural Environment

1) Temperature and Humidity

As a result of the measured temperature at each project site, it is judged that air-conditioners shall be installed in the studio floor and sub-control room of Semera Radio Studio where temperature went up to 40°C in daytime.

Although Ethiopian side made an additional request for the installation of air conditioners at Semera and Dire Dawa Radio Studio, it was confirmed that air conditioners will be installed at Semera Radio Studio and Dire Dawa Radio Studio by Afar REB and Dire Dawa REB respectively.

All rooms except studio floor and control room of Semera Radio Studio are already equipped with window type air conditioners. It was confirmed that Afar REB is procuring soundproof separate type air conditioners for studio floor and control room.

Dire Dawa REB will also procure soundproof separate type air conditioners for studio floor and control room by the budget in 2003/04.

2) Earthquake

No earthquake has been recorded in Ethiopia for the past 100 years.

Thus, quake-proofing will not be considered on the equipment.

## **2-2-2 Basic Plan**

(1) Equipment Plan

Equipment Plan should follow the policies of the Basic Design Study.

1) Set up of Equipment Scale

It was confirmed that planned number and contents of programs produced after the Project at each studio will remain the same as those of the Basic Design Study. Thus, scale and contents of the equipment to be procured under the Project shall be same as the Project (Phase I).

## 2) Selection of Equipment Model

- (a) Concerning the equipment operated on computer with software (i.e. digital audio mixer, digital audio editor, non-linear editor), its operational procedure differs by manufacturers for they are engaged in competition on their equipment features by developing their own software and that will consequently preclude the mutual availability of the accumulated program contents if the manufacturer differs in procurement of the equipment. This problem will occur further on the difference in version of software even of the same equipment and cause great disparities in operational procedure. Therefore, considering the convenience for the operation and maintenance of equipment at a studio and the optimization of the project effect, it is desirable to procure the equipment of the model same as per procured in the Project (Phase I) at least in respect of the equipment operated by software. If the equipment of the model different from that used under the Project (Phase I) is procured for this Project, the following disadvantages will emerge:

So far, EMA has conducted training for its own engineers to raise their technical level who become instructors to give training to the engineers of the Regional Education Bureaus. However, if the equipment model differs from that with which training has been conducted, the training plan of EMA will lead to poor continuity and in consequence the training of the engineers of the Regional Education Bureaus will become difficult, and thus affect the continuity of the Project.

If the equipment is not compatible with one another enough to share spare parts, each Regional Education Bureau will try to keep own spare parts independently, which causes to increase the maintenance cost and that will eventually affect the continuity of the plan.

An advance training course using the equipment of EMA provided under the Project (Phase I) is scheduled before the implementation of this Project in order to ensure the smooth program producing works after the Project has been completed. However, if the equipment model differs from that with which training is scheduled, the operational procedure of equipment will be completely changed and as a result the effects of the advance training cannot be expected.

- (b) Standardization of VTR Recording System

If the VTR recording system differs from that adopted for the Project (Phase I), the

compatibility of the VTR tapes cannot be maintained between the EMA and the Tigray Regional Education Bureaus to make the mutual availability of the program contents impossible between the two bureaus, and that will eventually increase the maintenance cost and thus affect the continuity of the Project.

(c) Spare Parts

Spare parts to be procured along with the equipment shall be the same contents and quantity as the Project (Phase I) to ensure smooth operation without acquisition of new parts for at least one year after the handover of equipment.

(2) Composition of Equipment

As the result of the examination and evaluation of the design policies and conditions, the compositions of the main equipment to be procured for Radio Studios (Addis Ababa, Semera, Harar in Oromia, Dire Dawa, Mizan Teferi, Harar in Harari) and Mekelle TV Studio are as follows;

**Table 2-2-6 Equipment List**

**(Addis Ababa, Semera, Harar in Oromia, Dire Dawa, Mizan Teferi, Harar in Harari Radio Studio)**

Equipment	Quantity	Remarks
(a) Radio Recording Studio		
Condenser Microphone	2 sets	
Dynamic Microphone	3 sets	
Microphone Table Stand	3 sets	
Microphone Boom Stand	2 sets	
Microphone Floor Stand	2 sets	
Microphone Cable	1 set	
Digital Audio Mixer(16-input)	1 set	16-input Digital Stereo Mixer, Professional Type
CD Recorder/Player	3 sets	Professional Type
CD Disk	650 pcs	CD-RW
Cassette Tape Recorder/Player	1 set	Professional Type
Monitor Speaker (for Control Room)	2 sets	Incl., Speaker stand
Power Amplifier (for Control Room Speaker)	1 set	
Monitor Speaker (for Studio)	2 sets	Incl., Speaker stand
Power Amplifier (for Studio Speaker)	1 set	
Announce Cough Box	2 sets	
Announce Cough Controller I/F Unit	1 set	
Announce Cough Tally Indicator	1 set	
Announce Cough Connection Cable	2 sets	
Cough Box Connecting Box	1 set	
Back Talk Speaker with Amplifier	1 set	
Stereo Headphone (for Studio)	2 sets	
Stereo Headphone (for Control Room)	2 sets	
Earphone	4 sets	
Operation Desk	1 set	Mixer Table
Audio Equipment Wagon	1 set	
Multi Effect Processor	1 set	
Graphic Equalizer	1 set	
Audio Distribution Amplifier	1 set	
Audio Patch Panel	1 set	
Audio Patch Cable	1 set	
Word Sync. Generator	1 set	Sampling Frequency: 44.1kHz
Word Sync. Dividing Amplifier	1 set	
Recording Lamp Switch Box	1 set	
Recording Lamp Control Unit	1 set	
Recording Lamp	2 sets	
Chair	2 sets	for Mixing Engineer and Producer
(b) CD Duplication Room		
CD Recorder/Player (1 Master, 1 Slave)	2 sets	Professional Type
Audio Selector	1 set	4 × 1 (Stereo)
Duplication Interface Unit	1 set	
Monitor Speaker with Amplifier (Rack Type)	1 set	Rack mount type
System Rack	1 set	
Chair	1 set	
(c) CD Editing Room		
Digital Audio Editing System	1 set	MO Disk Type

Equipment	Quantity	Remarks
CD Recorder/Player	1 set	Professional Type
Monitor Display	1 set	for Editing
Monitor Speaker with Amplifier	2 sets	
Stereo Headphone	1 set	
0.5 kVA Uninterrupted Power Supply (UPS)	1 set	Single Phase 220V, 50Hz
Operation Desk	1 set	
Chair	1 set	
MO Disk	50 pcs	
(d) Maintenance Equipment		
Digital Tester	1 set	
Oscilloscope	1 set	
Audio Test Signal Oscillator	1 set	
Tool Kit (Large Type)	1 set	
Tool Kit (Portable Type)	1 set	
CD Recorder/Player	1 set	Professional Type
(e) Portable Cassette Tape Recorder/Player		
Portable Cassette Tape Recorder/Player	2 sets	Professional Type
Dynamic Microphone	2 sets	
Microphone Cable	2 sets	
Stereo Headphone	2 sets	
(f) Power Supply Equipment *		
Automatic Voltage Regulator (5kVA)	1 set	for Control Room, Single Phase 220V, 50Hz
Automatic Voltage Regulator (2kVA)	2 sets	for Editing Room and Maintenance Room, Single Phase 220V, 50Hz
* Power Supply Equipment of Mizan Teferi Radio Studio		
Automatic Voltage Regulator (5kVA)	1 set	for Control Room, Single Phase 220V, 50Hz
Automatic Voltage Regulator (3kVA)	1 set	for Editing Room, Single Phase 220V, 50Hz
(g) Spare Parts/Units	1 set	
(h) Installation Materials	1 set	

\* As Maintenance Room of Mizan Teferi Radio Studio will be a part of CD Editing Room, maintenance equipment such as an audio test signal generator, an oscilloscope, etc. will be installed in CD Editing Room.

Although two sets of 2kVA AVR (one for CD Editing room and one for Maintenance room) were planned to procure in the Basic Design Study, it shall be changed to procure one (1) 3kVA AVR in CD Editing room for Mizan Teferi radio studio.

#### The Basic Design Study

5kVA AVR 1 set  
2kVA AVR 2 sets



#### Implementation Review Study

5kVA AVR 1 set  
3kVA AVR 1 set

**Table 2-2-7 Equipment List (Mekelle TV Studio)**

Equipment	Quantity	Remarks
<b>(a) Portable Video Recording System</b>		
Portable Digital Camera built in VTR (PAL)	2 sets	1/2-inch 3CCD camera, Professional Type
Tripod with Dolly	2 sets	
AC Adapter	2 sets	
Wireless Microphone	2 sets	
Condenser Microphone	2 sets	Electret Lavalier Type
UHF Synthesized Transmitter	2 sets	UHF Band
UHF Synthesized Tuner Unit	2 sets	UHF Band
Camera Battery	6 sets	
Battery Charger	2 sets	
Camera Lighting Set	2 sets	
Lighting Kit	2 sets	
<b>(b) Non-Linear Editing System</b>		
Non-Linear Set	1 set	Hard Disk Type
Digital Video Tape Recorder/Player (PAL)	1 set	Professional Type
Editing Controller	1 set	
TBC Remote Controller	1 set	
14-inch Color Monitor (PAL)	1 set	Professional Type
Monitor Display for Non-Linear Set	2 sets	17-inch, LCD Type
Audio Monitor Speaker	2 sets	with Amplifier (built-in type)
Headphone	1 set	
1 kVA Uninterrupted Power Supply (UPS)	1 set	Single phase 220V, 50Hz
Editing Table	1 set	
Side Desk	1 set	
Chair	1 set	
<b>(c) VHS Video Tape Duplication System</b>		
Digital Video Tape Recorder/Player (PAL)	1 set	Professional Type
VHS Video Tape Recorder (PAL)	2 sets	Consumer Type
Audio/Video Distribution Amplifier (PAL)	1 set	
Audio/Video Selector	1 set	6 × 1
Monitor Speaker with Amplifier	1 set	Rack Mount Type
14-inch Color Monitor (PAL)	1 set	Professional Type
System Rack	1 set	
Chair	1 set	
<b>(d) Video Tape Logging System</b>		
Digital Video Tape Recorder/Player (PAL)	1 set	Professional Type
VTR Remote Controller	1 set	
14-inch Color Monitor (PAL)	1 set	Professional Type
Audio Monitor Speaker	2 sets	with Amplifier
Operation Desk	1 set	
Chair	1 set	
<b>(e) Power Supply Equipment</b>		
Automatic Voltage Regulator (2kVA)	2 sets	For Duplication Room and Studio Floor Single Phase 220V, 50Hz

Equipment	Quantity	Remarks
(f) Maintenance Equipment		
Digital Tester	1 set	
Oscilloscope	1 set	
Test Chart for Camera	2 sets	
Tool Kit (Large Type)	1 set	
Tool Kit (Portable Type)	1 set	
(g) Video Tape		
Digital Video Cassette Tape for 60 minutes	20 rolls	
Digital Video Cassette Tape for 30 minutes	40 rolls	
(h) Spare Parts/Units	1 set	
(i) Installation Materials	1 set	



### **2-2-3 Basic Design Drawings**

Fig. 2-2-3 Floor Layout of Addis Ababa Radio Studio

Fig. 2-2-4 Floor Layout of Semera Radio Studio

Fig. 2-2-5 Floor Layout of Harar in Oromia Radio Studio

Fig. 2-2-6 Floor Layout of Dire Dawa Radio Studio

Fig. 2-2-7 Floor Layout of Mizan Teferi Radio Studio

Fig. 2-2-8 Floor Layout of Harar in Harari Radio Studio

Fig. 2-2-9 Floor Layout of Mekelle TV Studio

Fig. 2-2-10 Block Diagram of Radio Recording Studio System (Radio Studio)

Fig. 2-2-11 Block Diagram of CD Editing System (Radio Studio)

Fig. 2-2-12 Block Diagram of CD Duplication System (Radio Studio)

Fig. 2-2-13 Block Diagram of Portable Video Recording System (Mekelle TV Studio)

Fig. 2-2-14 Block Diagram of Non-Linear Editing System (Mekelle TV Studio)

Fig. 2-2-15 Block Diagram of VHS Video Tape Duplication System (Mekelle TV Studio)

Fig. 2-2-16 Block Diagram of Video Tape Logging System (Mekelle TV Studio)

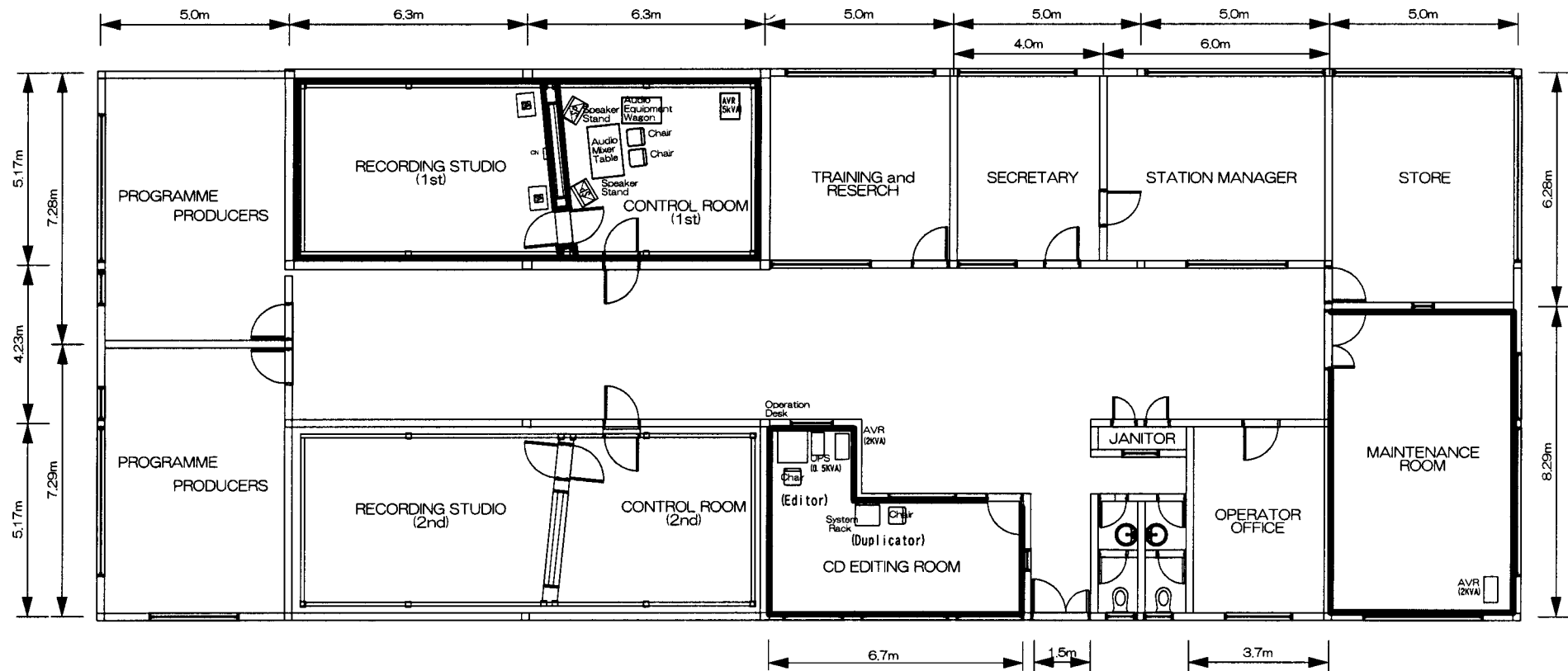


Fig. 2-2-3 Floor Layout of Addis Ababa Radio Studio

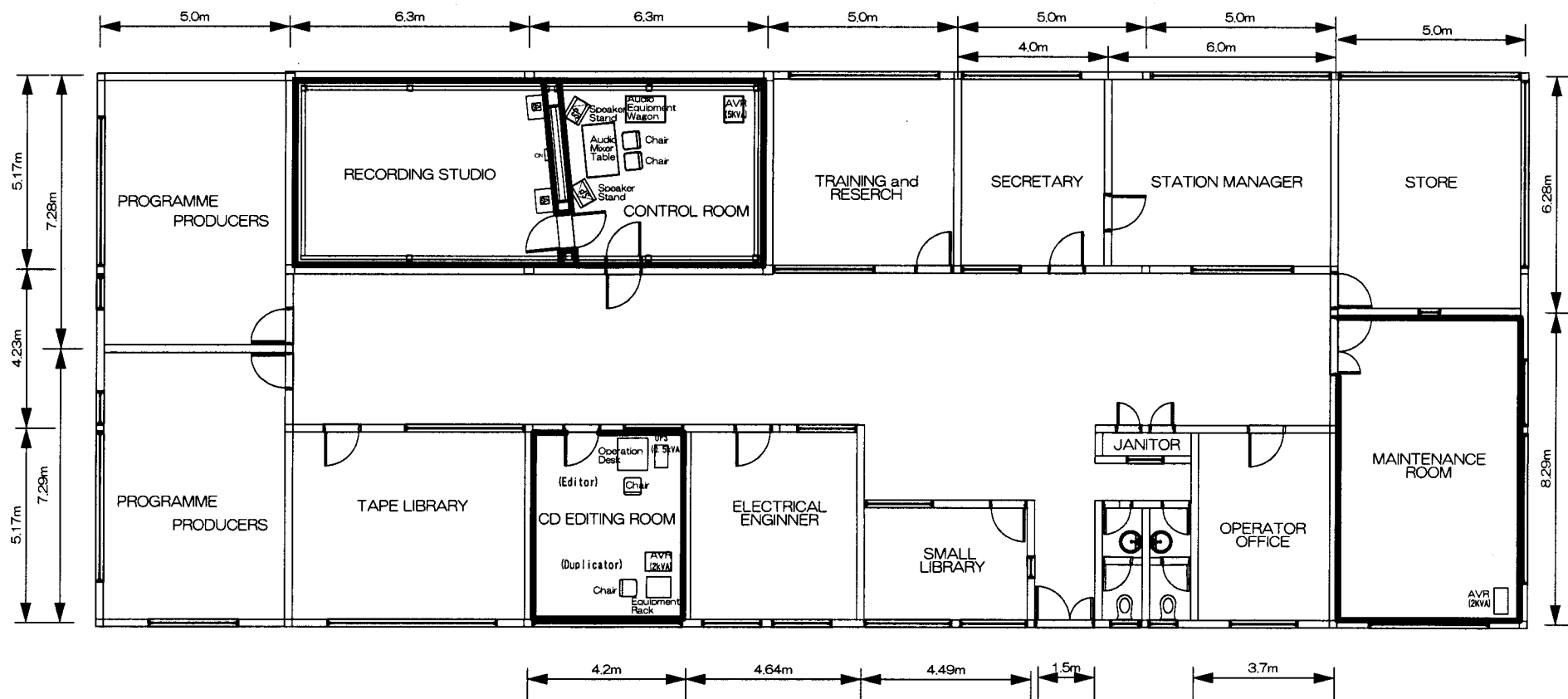


Fig. 2-2-4 Floor Layout of Semera Radio Studio

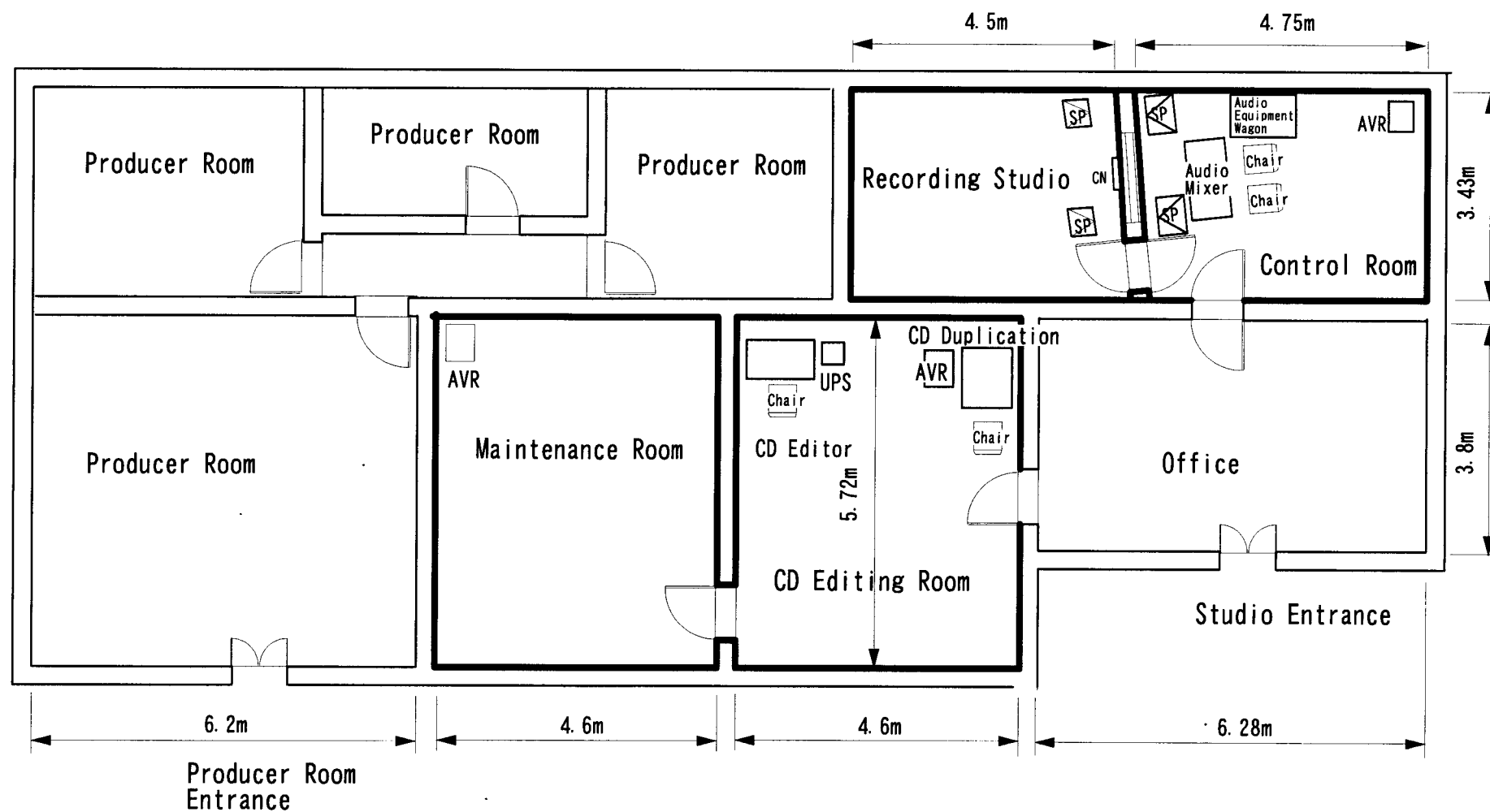


Fig. 2-2-5 Floor Layout of Harar in Oromia Radio Studio

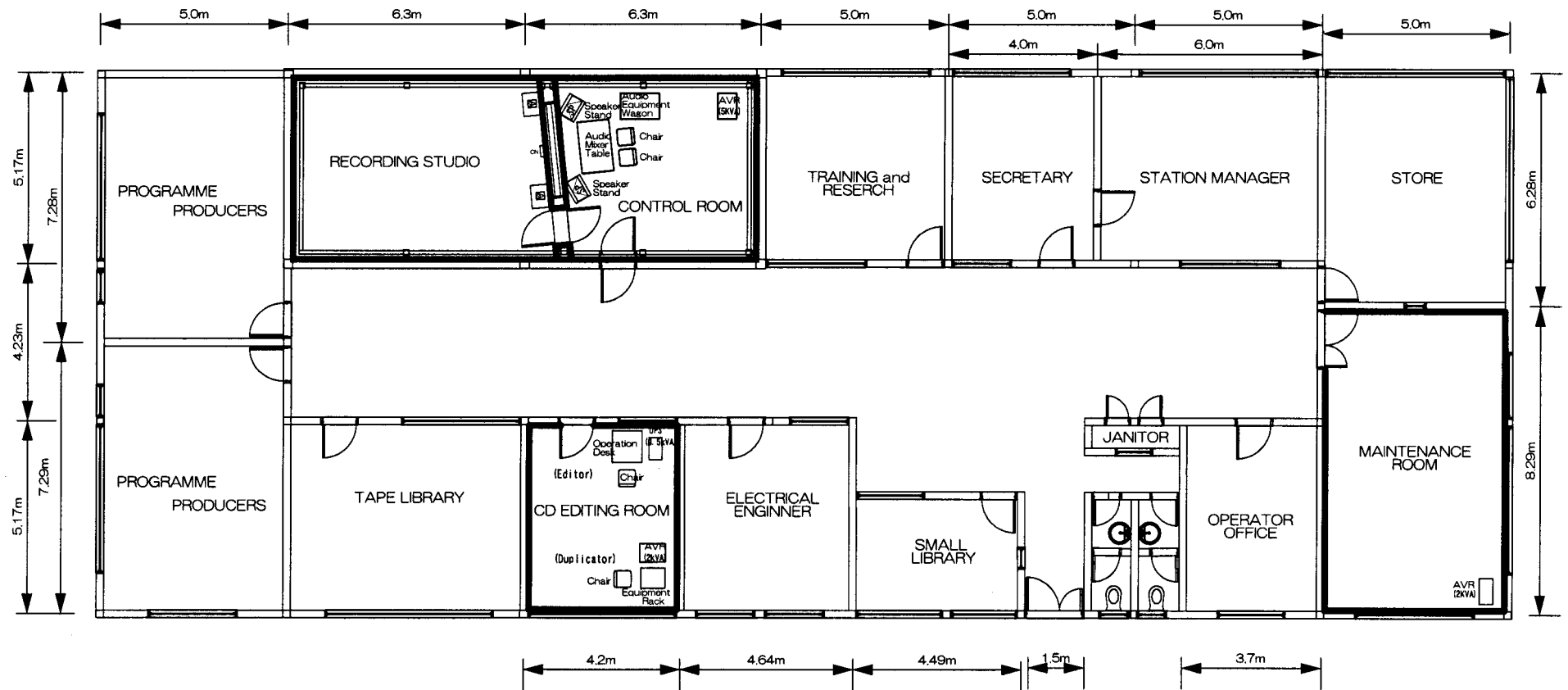


Fig. 2-2-6 Floor Layout of Dire Dawa Radio Studio

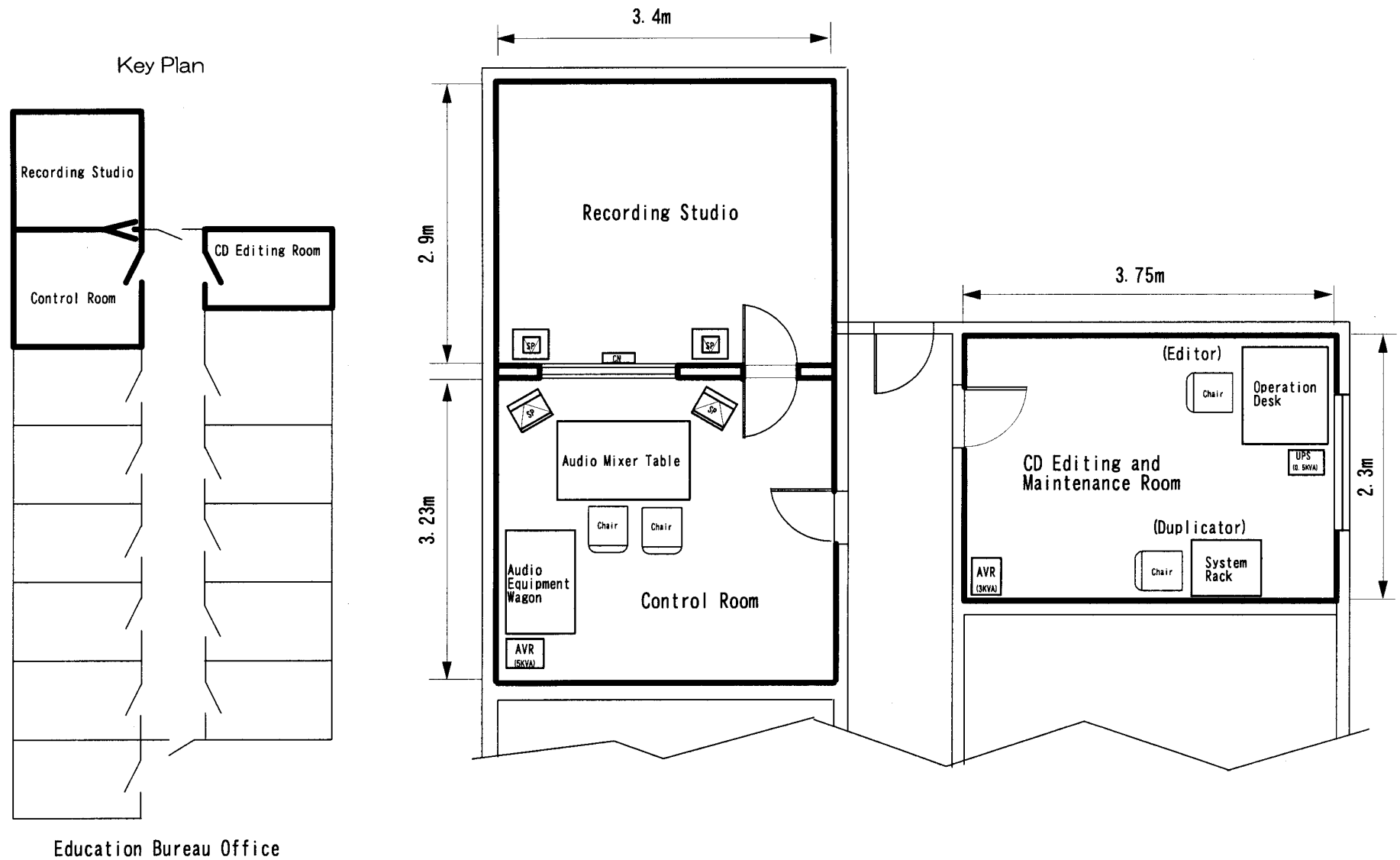


Fig. 2-2-7 Floor Layout of Mizan Teferi Radio Studio

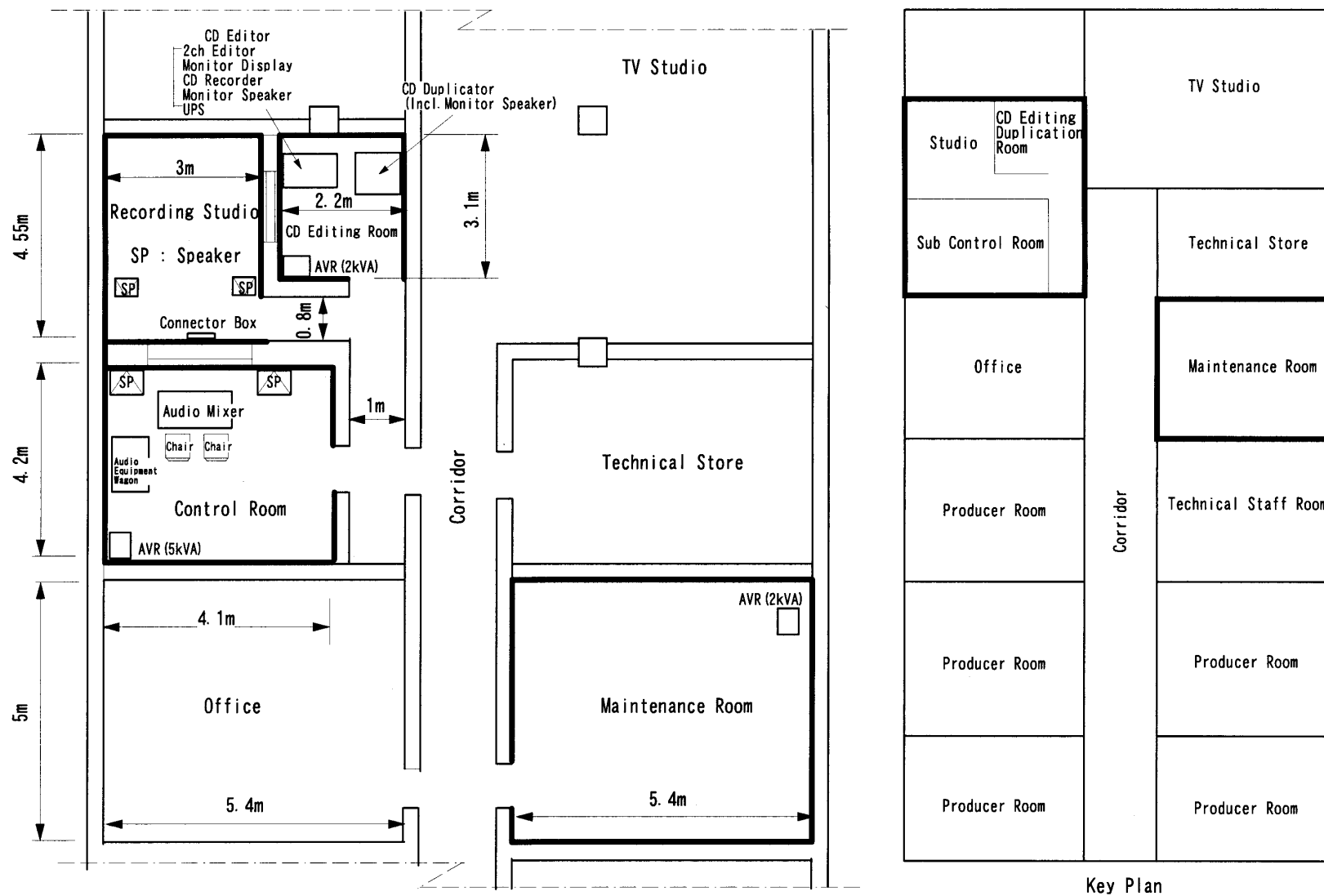


Fig. 2-2-8 Floor Layout of Harar in Harari Radio Studio

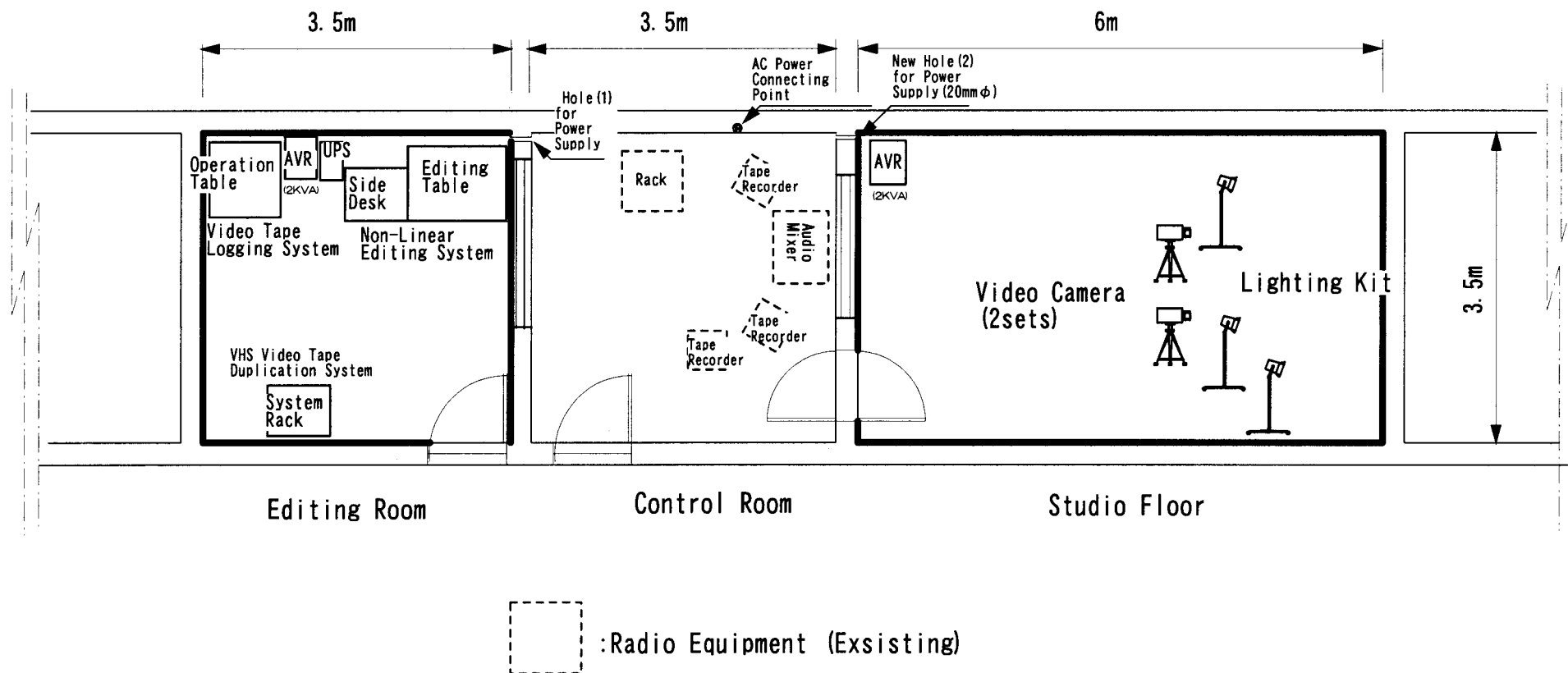


Fig. 2-2-9 Floor Layout of Mekelle TV Studio



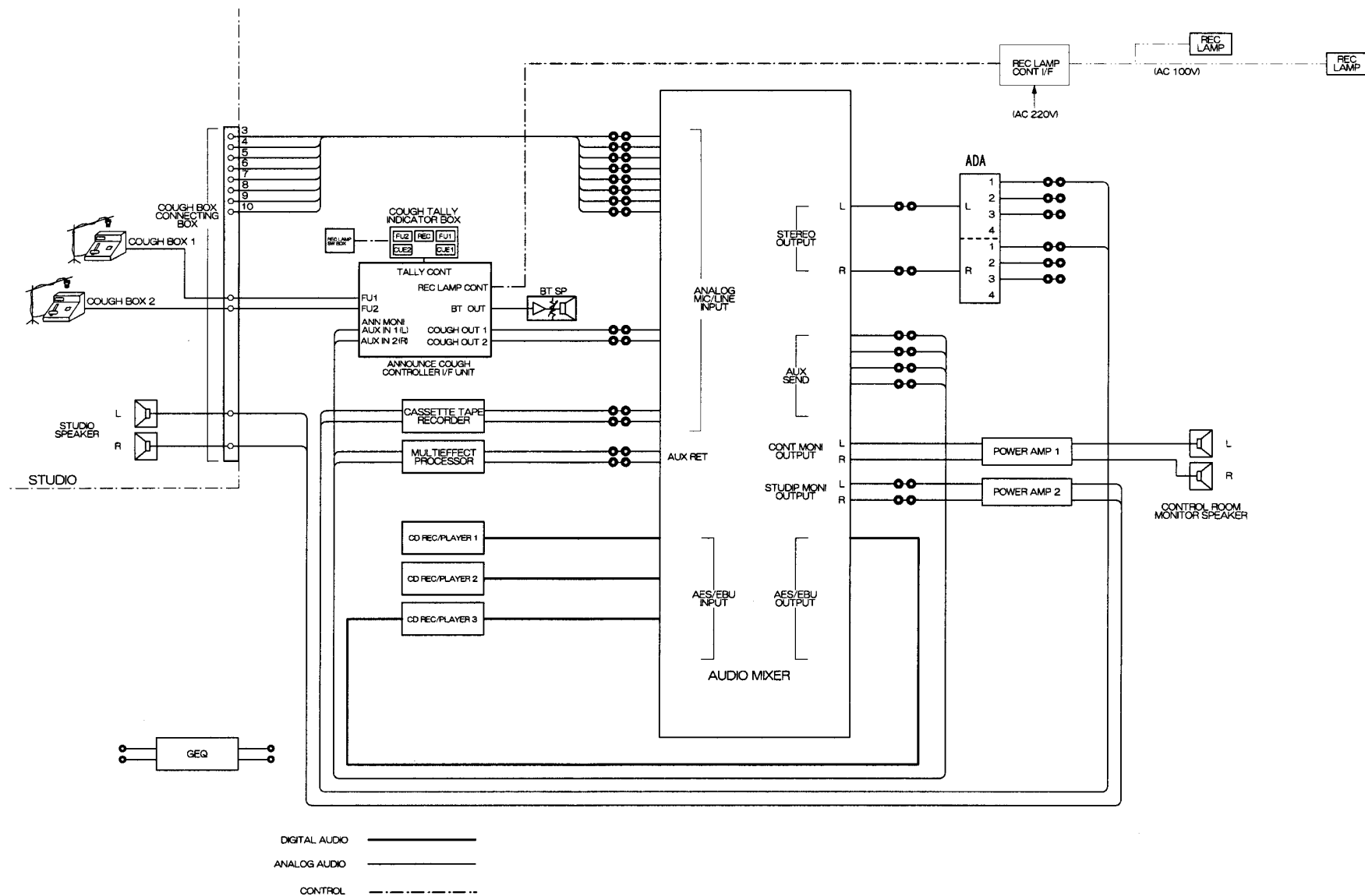
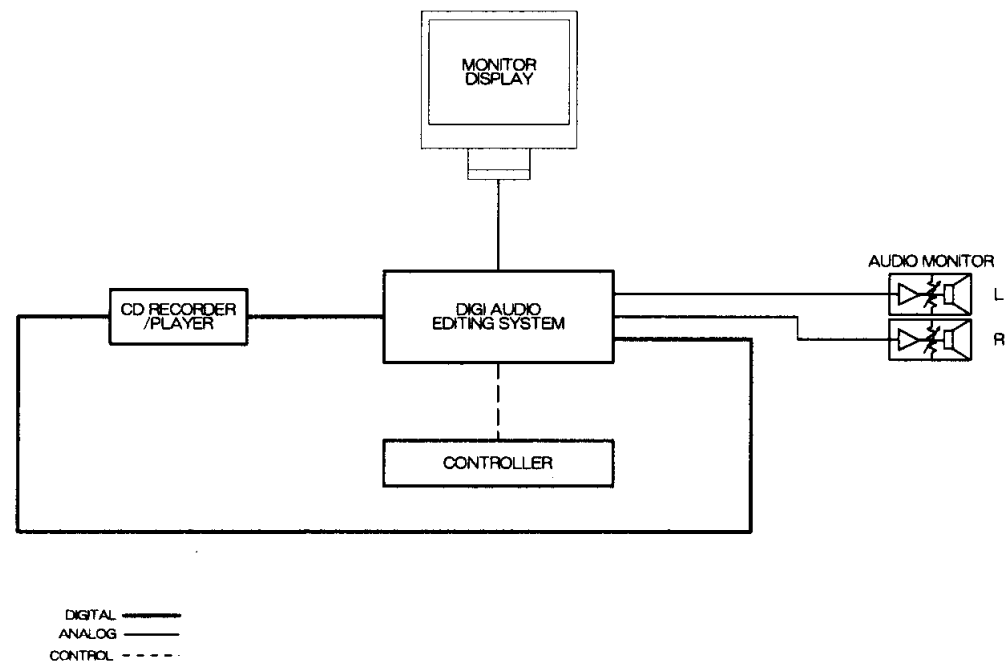
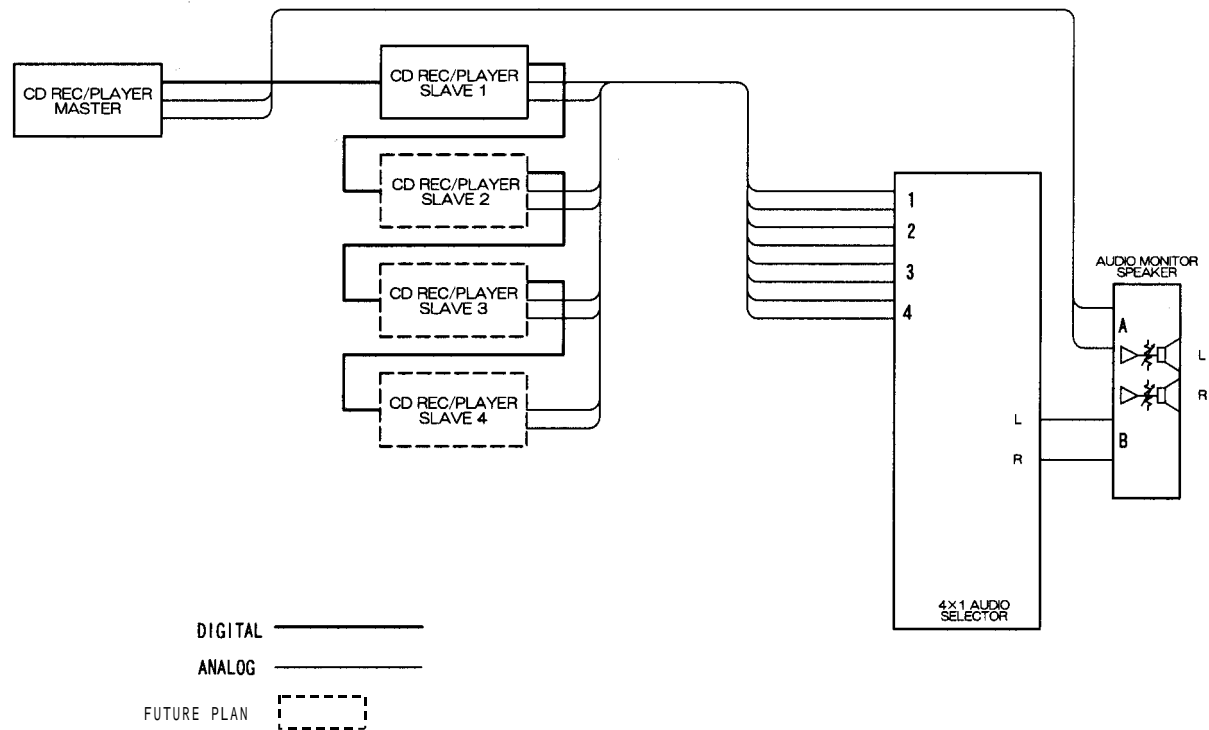


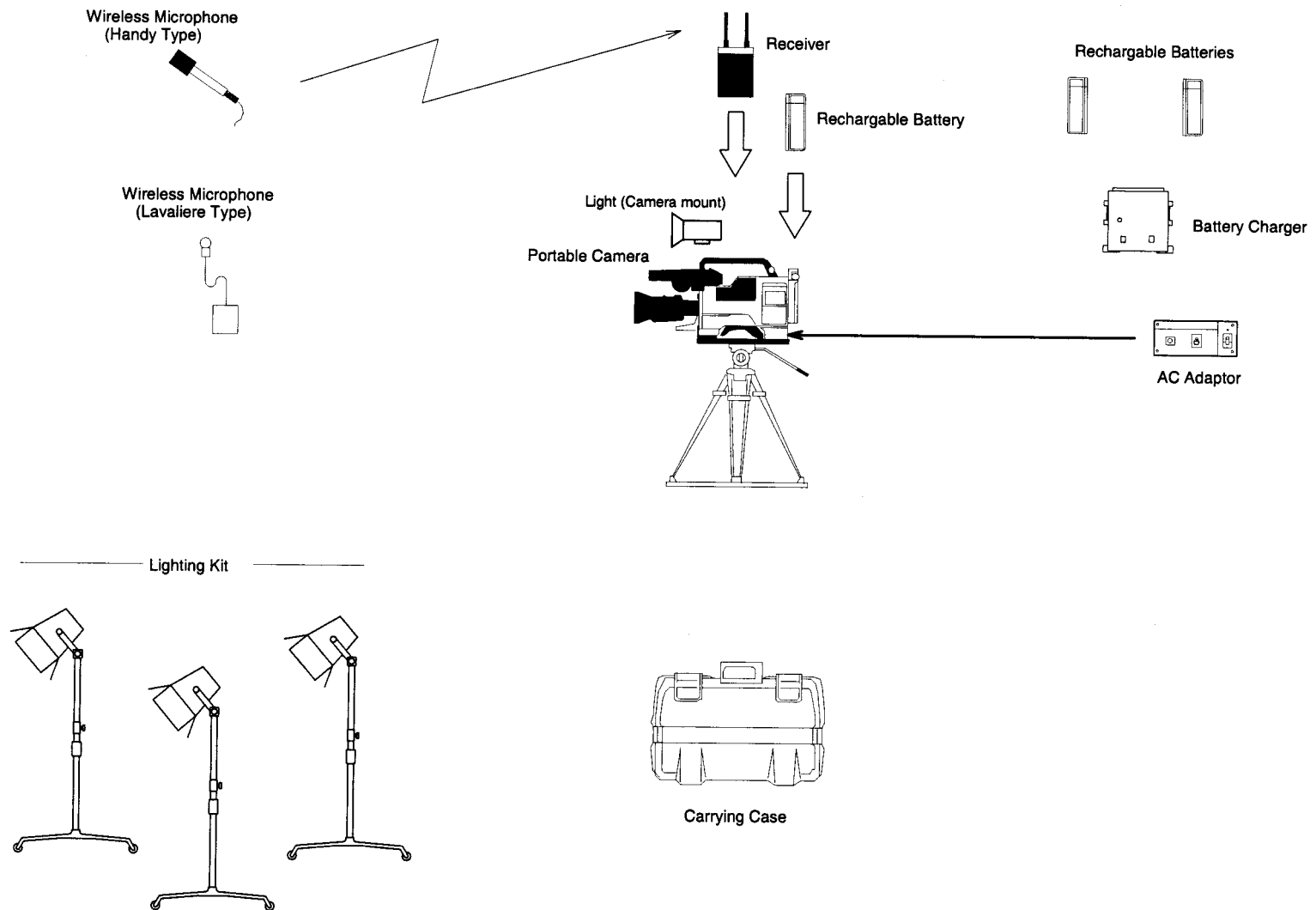
Fig. 2-2-10 Block Diagram of Radio Recording Studio System (Radio Studio)



**Fig. 2-2-11 Block Diagram of CD Editing System (Radio Studio)**



**Fig. 2-2-12 Block Diagram of CD Duplication System (Radio Studio)**



**Fig. 2-2-13 Block Diagram of Portable Video Recording System (Mekelle TV Studio)**

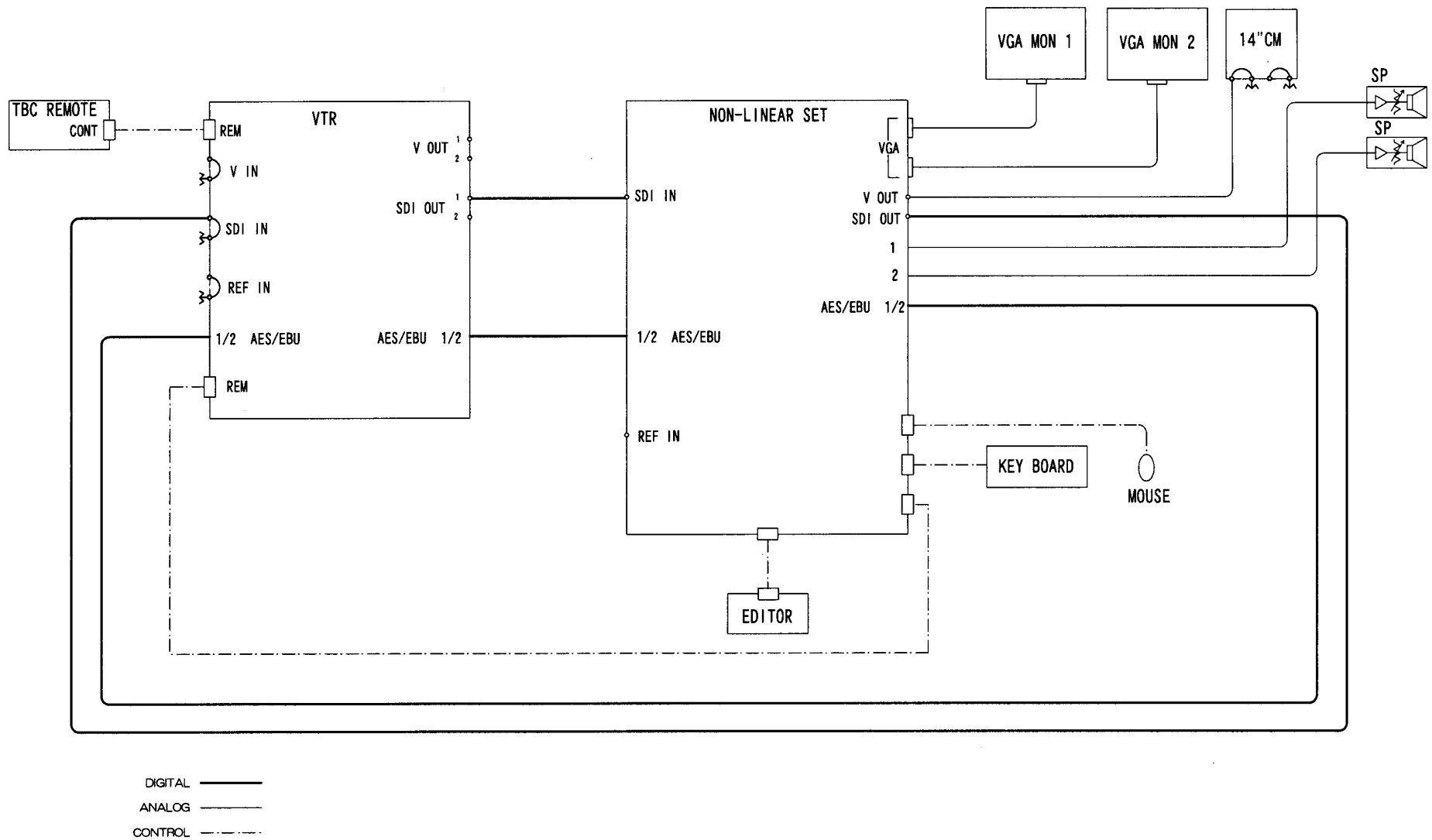
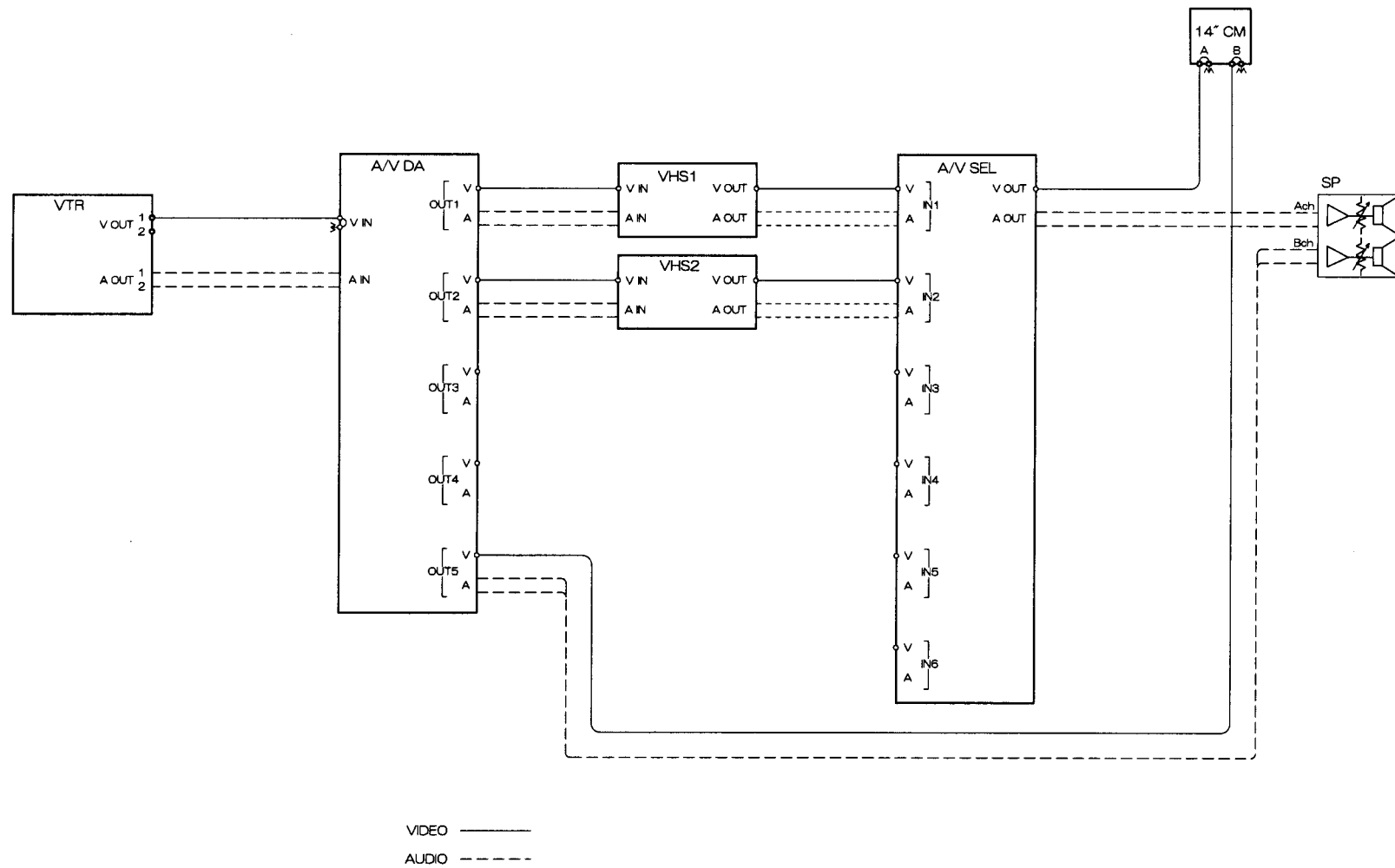
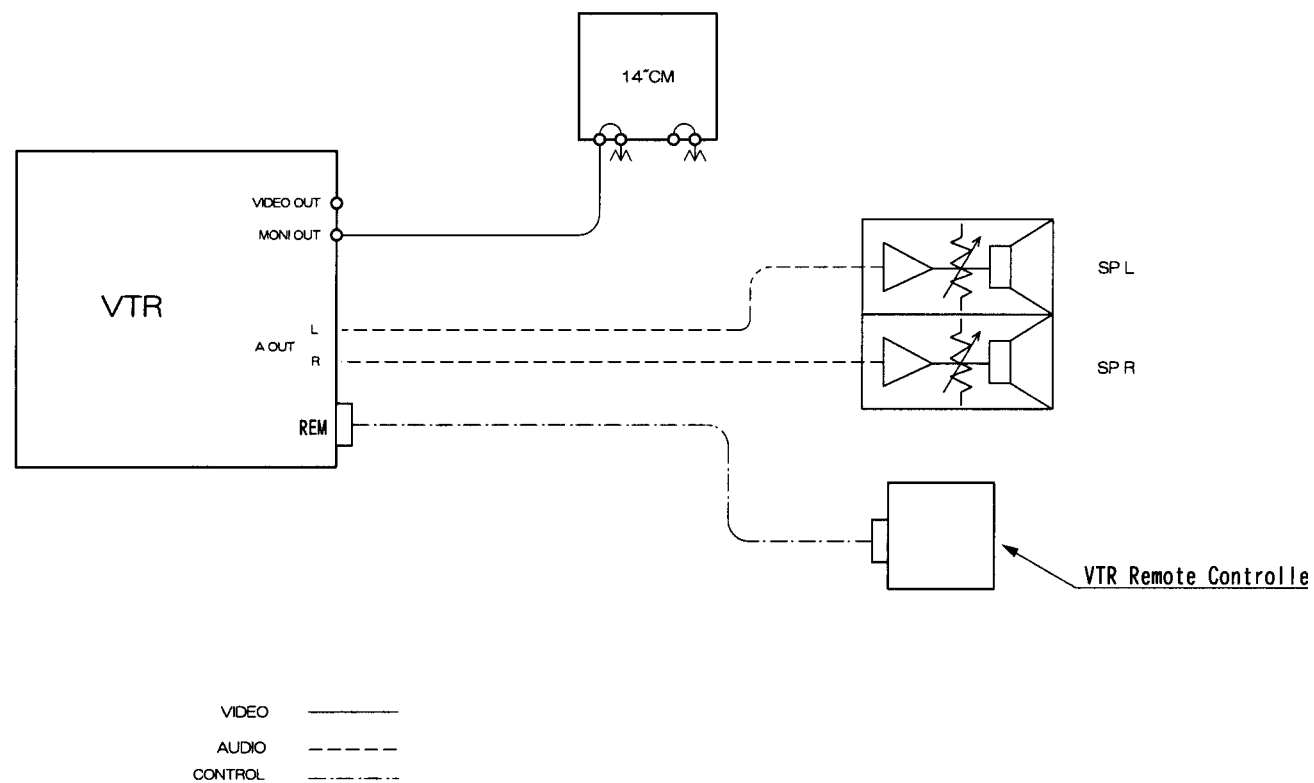


Fig. 2-2-14 Block Diagram of Non-Linear Editing System (Mekelle TV Studio)



**Fig. 2-2-15 Block Diagram of VHS Video Tape Duplication System (Mekelle TV Studio)**



**Fig. 2-2-16 Block Diagram of Video Tape Logging System (Mekelle TV Studio)**

## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

The Project will be implemented according to the framework of the grant aid scheme of the Government of Japan in the same way as the Project (Phase I). Therefore, it shall be implemented, following cabinet decision by the Government of Japan and the exchange of notes (E/N) between the governments of both countries. Pursuant to the E/N, EMA (the client) shall conclude an agreement with the consultant which shall then enter into the detailed design of the Project and draw up tender documents.

Tender documents prepared by the consultant shall be distributed to prospective tenderers following announcement of the tender after approval has been obtained from the client and the Government of Japan. A Japanese equipment contractor selected through the tender will conclude the contract with EMA and procure and install the equipment specified. The agreement between EMA and the consultant and the contract between EMA and the equipment contractor will become effective upon the verification thereof by the Government of Japan.

#### **(1) Project Implementing Agency**

The responsible project implementing agency is EMA and the project implementing agencies are 7 Regional Education Bureaus (Addis Ababa, Afar, Oromia, Dire Dawa, SNNP, Harari and Tigray) under the supervision of the Ministry of Education (MOE).

Although the Project will be carried out for 7 REBs, EMA shall be the client the same as the Project (Phase I) and act as a liaison office to coordinate the entire works for the smooth implementation of the Project making full use of the experiences of the Project (Phase I).

Seven REBs shall make sure full understanding of the Japan's grant aid system and maintain close communications with EMA to coordinate necessary works in all stages of the Project appropriately.

MOE and regional governments should make up utmost effort in order to secure sufficient budget for enabling 7 REBs to conduct appropriate operation and maintenance continuously after the Project.

EMA and 7 REBs should place emphasis on the following items concerning the project implementation.

- Appropriation of funds for the works to be done by the Ethiopian side at the project sites and drafting of work plans according to the project implementation schedule.
- Identification and processing of governmental procedures required during the project



implementation period.

- Identification and sorting out of permits and licenses related to implement the Project and provision of pertinent information and assistance for the consultant.

(2) Consultant Firm

After the signing of the E/N, EMA will enter into a consultant agreement with a Japanese consultant firm who conducts the detailed design of the Project and will apply to the Government of Japan for verification of the agreement. After the verification of the agreement, based on this report on the Project the consultant firm will prepare tender documents consisting of tender instructions, a draft contract, general contract conditions, equipment specifications, equipment drawings, etc., while discussing details of the Project with EMA and 7 REBs.

In the tender stage, the consultant shall act on behalf of EMA in carrying out all tender process up to the signing of contracts between EMA and the equipment contractor, including advertisement of the tender, distribution of tender documents, questions and answers, opening of bids, contract negotiations, and so on. Moreover, during the installation work of the equipment the consultant shall implement all supervisory works on installation, adjustment and handing over.

(3) Equipment Contractor

The equipment contractor will be selected through tendering among Japanese trading companies that meet certain requirements and qualifications. The equipment contractor will procure and install the equipment to the project sites according to the equipment specifications and drawings of the tender documents and within the period of execution specified in the contract. During the installation work of the equipment, the equipment contractor will dispatch engineers specialized in each type of equipment to Ethiopia for the installation work and explanation on the operation of equipment to the Ethiopian staff.

(4) Necessity for Equipment Installation Staff

Most of the equipment to be procured under this Project will be manufactured in Japan and shipped to the project sites in disassembled components if necessary to avoid damages during transportation. To restore these equipment as the program production system, it is necessary for these components to be reassembled, installed, and adjusted at respective project sites.

Because this disassembly and reassembly work is based on know-how specific to the equipment manufacturers, sophisticated technical levels are required in order to adjust and test equipment

after installation, and the installation work entails a series of handing over procedures including explanation and training of maintenance and operation methods of equipment, and inspection of quantities of the equipment, etc., it is essential that engineers be dispatched from the manufacturer for the installation work. The number of dispatched engineers and dispatch period shall be kept to a minimum, and installation work shall be implemented while carrying out technology transfer to the program production engineers of EMA and REBs in the same way as the Project (Phase I).

#### **2-2-4-2 Implementation Conditions**

##### **(1) Ensuring Safety throughout Implementation Period**

In implementing the installation work of the equipment, the latest information with regard to the public security around the project sites should be checked to ensure safety.

It is necessary to consult on ensuring safety with Japanese governmental agencies (Embassy of Japan in Ethiopia, JICA Ethiopia Office, Ministry of Foreign Affairs, JICA Headquarters) and the Ethiopian counterparts (Ministry of Education, EMA, Regional Education Bureaus, etc.) to determine alternative plans as required.

##### **(2) Arrangements of Concern on Natural Environment**

Out of the project sites, Semera in Afar region is situated in the desert area of intense heat, where air temperature exceeds 50 °C daytime and might not fall below 30 °C throughout a day.

As the office hours of Afar Regional Education Bureau is divided in two that is the morning time of 7:00 a.m. to 10:00 a.m. and the late afternoon time of 3:00 p.m. to 6:00 p.m. to avoid the heat of daytime, it is essential to take measures against the heat.

Under such severe environment of the Semera site, the efficiency of the equipment installation work is considered considerably low compared with other sites. (It was experienced in the Gambella radio studio when implementing the Project (Phase I) that the installation work executed under the air temperature of 45 °C fell significantly behind schedule.)

It is required for the Semera site, considering the limit of work performance due to such severe environment, to set up installation work period longer than that in other sites.

##### **(3) Arrangements of Concern on Installation Work**

Seven (7) project sites are scattered throughout the Ethiopian territory, where road, power supply and other living conditions are insufficient, and installation work of the equipment must be carried out under such adverse conditions. Therefore, it is important to establish in advance an

effective implementation organization for successful completion of the Project on schedule.

1) Man Power for Installation Work

The installation work by the equipment contractor will be conducted under the following organization in consideration of the geographical features, climate, infrastructure of each project site.

- Manager of the Installation Work: one (1) person (dispatch from the equipment contractor)

Manager, in residence in Addis Ababa, shall undertake the management and supervision on overall installation works including schedule control and confirmation and secure of security of the work teams. Manager is also responsible in solving problems if arise during transportation and installation work of the equipment. Manager shall make the best effort for the completion of the Project within the term of contract. Manager should go to project sites on duty according to the situation and progress of the installation work at the site.

- Installation Work Team: set up two (2) teams.

Team A: Installation Engineer: two (2) persons (dispatch from the equipment contractor)  
Installation Assistant: three (3) persons (Ethiopian Technicians)

Team A takes charge of the installation works in four (4) sites: Addis Ababa, Dire Dawa, Harar in Oromia and Harar in Harari in series.

Route of Installation Work

Addis Ababa → by Flight → Dire Dawa → by Vehicle →  
Harar in Oromia → by Vehicle → Harar in Harari → by Vehicle →  
Dire Dawa → by Flight → Addis Ababa

Team B: Installation Engineer: two (2) persons (dispatch from the equipment contractor)  
Installation Assistant: three (3) persons (Ethiopian Technicians)

Team B takes charge of the installation works in three (3) sites: Mizan Teferi, Semera and Mekelle (TV studio) in series.

Route of Installation Work

Addis Ababa → by Flight → Mekelle → by Flight →  
Addis Ababa → by Vehicle → Mizan Teferi → by Vehicle →  
Addis Ababa → by Vehicle → Semera → by Vehicle →

## Addis Ababa

(Ethiopian Airways operate a flight a week using a small Cessna plane between Addis Ababa and Mizan Teferi, but the flight is actually useless for frequent cancellation due to bad weather.)

It is noted that car renting is not available at the project sites in regions, so that all necessary vehicles have to be rented in Addis Ababa.

It is also noted that the equipment procured and the work team shall arrive at the site exactly the same time. (Otherwise, it may cause the delay of installation work) It should adjust the work schedule closely and frequently during implementation subject to insufficient road and traffic conditions to the sites.

### 2) Confirmation of Electric Power Supply

Before the commencement of the installation work, it is necessary to confirm the conditions of electric power supply facilities (capacity of receiving lines, specification of an integrating wattmeter, capacity of an receiving NFB, etc.) at the site so as to have been improved as directed according to the instructions made at the time of Implementation Review Study and to have a sufficient load capacity for the equipment newly installed.

### 3) Noise

The equipment such as AVRs functionally inevitable to generate noise shall be kept away from audio mixers, editing machines, etc so as not to affect the program production.

### 4) Preparation of Standby Power Supply

The electricity situation of Ethiopia is very tight, where accidental power failure occurs several times a day and moreover all day rolling blackouts is enforced two (2) times a week during dry season. Such meager public power supply will cause the delay of the implementation of the Project.

To carry out the installation work of the equipment smoothly, it is required to prepare a standby power supply means (generator and automatic power selector switch) with a capacity enough to carry out the installation work during public power failure.

#### 5) Secure of Communication Means

Out of seven (7) project sites, six (6) sites are situated in remote provincial cities and the communication to these cities is very difficult. Moreover, some of these seven (7) sites are located in the dangerous areas Ministry of Foreign Affairs of Japan released in its overseas security information.

Communication means is indispensable to the work teams for security management and site condition reporting, while the use of cellular phones in Ethiopia is limited to only in Addis Ababa city area but unusable in regions. Therefore, the work teams shall carry wireless movable phones such as Iridium which can call anywhere in the world.

#### (4) Conducting OJT

The staff of EMA and Regional Education Bureaus need to be fully trained especially with regard to the operation, periodic maintenance, and parts replacement of the digital equipment to be procured under this Project.

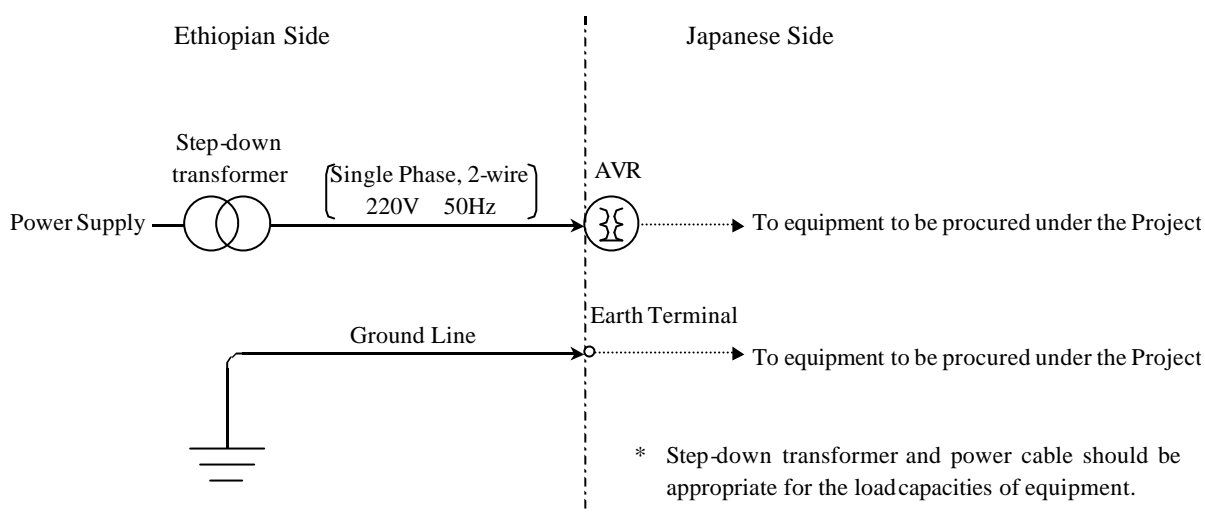
OJT will be conducted by inviting as many persons as possible from EMA and Regional Education Bureaus at the time of installation and adjustment of the equipment.

#### 2-2-4-3 Scope of Works

The scopes of works to be done by Japanese and Ethiopian sides respectively are defined as follows, in case the Project is implemented under Japan's grant aid.

Items	To be covered by Grant Aid	To be covered by Ethiopian side
Procurement, transportation, installation and adjustment of the equipment		
Securing of a storage space for the equipment to be procured under this Project at each site		
Necessary technical measures to be taken by the Ethiopian side at each site by the time of the installation work		
Payment of Customs duties to be imposed on the equipment to be procured and imported under this Project		
Acquisition of all the legal authorizations required in Ethiopia		
Issue of the authorization to pay and payment of bank commissions arising from issue and revision of this		
Appropriate and efficient operation and maintenance of the equipment to be procured under this Project		
Execution of other undertakings of the Ethiopian side defined in the Exchange of Notes		

Fig. 2-2-17 shows the responsibility for electric power supply and grounding works at each site.



**Fig. 2-2-17 Responsibility for Electric Power Supply and Grounding Works**

#### **2-2-4-4 Consultant Supervision**

##### **(1) Basic Concept of Supervision**

To ensure the smooth execution of the Project, the consultant shall organize a project team to facilitate from detailed design to supervising the procurement/installation works of the equipment. The basic concept of the supervision work shall be as follows.

- 1) Carry out fine-tuned adjustments among supervising members to ensure that no discrepancies arise on the contents of the installation work of the equipment at each site, and make the utmost effort to ensure completion of the Project on schedule.
- 2) Appropriately report on work progress to related organizations in both countries to ensure there are no discrepancies in their understandings on the progress of the Project. Moreover, give prompt responses and advice to inquiries from the equipment contractor to ensure the smooth progress of works.
- 3) Be prepared to offer technical transfer to officials of the Ethiopian side as much as possible in order to achieve the utmost effects of the grant aid. Moreover, always be ready to offer adequate and appropriate explanations concerning not only the design contents of the

equipment but also execution methods and execution technology, etc.

(2) Contents of Consultant's Supervision

1) Contract-related Work

The consultant shall implement the following: preparation of detailed design and tender documents, handling of the bid from announcement of tender through to opening of the bids, assessment of tenders and selection of the equipment contractor, holding of contract negotiations, and witnessing of the contracts, etc., and report on the progress and results of such works to the client at appropriate time.

2) Screening of Items Submitted by Equipment Contractor

The consultant shall review execution plans, work schedules, equipment design drawings, equipment installation drawings, etc. submitted by the equipment contractor and approve them upon confirming their compliance with design drawings and specifications, etc.

3) Supervision of the Installation Work

The consultant shall dispatch supervisors to all project sites at appropriate time during the execution period to monitor whether installation work is implemented by the equipment contractor in accordance with drawings and specifications and to give the necessary instructions. Moreover, the consultant shall constantly monitor in detail the progress of the installation work and offer appropriate advice and guidance to the equipment contractor. The consultant shall prepare monthly reports of work progress and inform related parties of the progress of works.

4) Cooperation Regarding Payment Approval Procedures

Concerning contract price to be paid to the equipment contractor, the consultant shall examine all requests for payment, etc. that are submitted by the equipment contractor, and issue the necessary certificates.

5) Witnessing of Inspections

The consultant shall witness or implement the following: pre-shipment inspections of the equipment, various tests implemented at project sites, and completion inspections. The consultant shall give approval to inspection results when they comply with specifications and design documents, or issue the proper instructions to the equipment

contractor if nonconformities are found. Test results shall be compiled into a monthly report and fed back to the related parties.

6) Assistance of Handing Over Procedures

In addition to compiling the completion inspection report, the consultant shall review and approve the total quantity of the equipment, spare parts and the equipment operation and maintenance manuals, etc. that are handed over by the equipment contractor and provide pertinent advice to the client concerning the maintenance and operation of the equipment.

(3) Supervision Staffing Plan

The seven (7) project sites are scattered throughout the Ethiopian territory.

The equipment installation works at the project sites will be carried out by the equipment contractor with two (2) installation work teams going around the sites in the following sequence respectively.

Team A: Addis Ababa → Dire Dawa → Harar in Oromia → Harar in Harari

Team B: Mekelle → Mizan Teferi → Semera

One chief consultant and two (2) consultants, in total three (3) consultants will be dispatched to supervise the installation work of the equipment at the project sites.

The chief consultant, in residence in Addis Ababa, shall always accurately recognize the state and progress of the Project keeping in close contact with each project site as well as with the Ethiopian government agencies (Ministry of Education, Ministry of Financial and Economic Development, etc.), EMA and the equipment contractor. He shall be ready for any trouble arising in the project sites such as accidents, disasters, etc. and to take immediate action when happened. He shall go to the project sites in regions for witnessing the official handover of the equipment.

The two (2) consultants shall travel to the sites together with the installation work teams of the equipment contractor respectively in order to directly supervise the installation works at project sites.

The consultant members will be selected from those who are familiar with the site conditions through participating in both the Basic Design Study and Implementation Review Study of this Project.



#### **2-2-4-5 Quality Control Plan**

According to the policies established in the basic design, the consultant firm will control the quality of works throughout the process of the project implementation.

“Quality control” in this case refers to and bases on the definition of the quality control terminology of Japan Industrial Standard - “a system of means to economically produce goods or services in the quality required by the buyer thereof.”

The quality control activities to be carried out by the consultant members consist of the following:

- (1) Examine various drawings, technical documents, samples, and other items submitted by the equipment contractor and check their conformity to the standards and requirements stipulated on the drawings and specification of the tender documents.
- (2) Cooperate with a reputable third-party testing institution to inspect the equipment to be procured under the Project before shipment.
  - Check the packing list against the equipment list attached to the contract.
  - Check the actual equipment against the packing list.
  - Issuance of Inspection Certificate

#### **2-2-4-6 Procurement Plan**

##### **(1) Procurement Plan**

Eligible countries for supply of equipment are as a rule limited to Japan or the recipient country in Japan’s grant aid projects. However, Radio/TV program production equipment, which is composed of state-of-the-art electronic components, is not produced in Ethiopia.

All of the equipment for EMA Radio/TV studios and Gambella Radio Studio procured under the Project (phase I) were made in Japan.

In the light of their performance stability, reliability, certainty of supply, and follow-up setup (in particular, spare parts supply is guaranteed for 10 years in the case of Japanese equipment), it is the best that all the equipment shall be procured from Japan the same as the Project (Phase I).

##### **(2) Equipment Transportation Plan**

Equipment shipped from Japan will be unloaded at Djibouti port and therefrom transported by land to each project site. The number of days necessary for the transportation of the equipment from Japan to each site is predicted as follows:

- Japan – Djibouti Port

There are no regular ocean freight services directly connecting Japan and Djibouti. There is an indirect service from Japan to Djibouti once a week via Malaysia and Dubai port where containers from Japan are transferred to a ship that goes to Djibouti port. Shipping via this route took 30 days at time of the Project (Phase I).

As Djibouti Port is relatively adequately equipped for handling containers and other types of cargos, unloading works of cargos will be carried out smoothly.

- Djibouti Port – Project sites

Djibouti Port to Ethiopian border	<u>Transportation</u>	<u>Distance</u>	<u>Time needed</u>
	Truck	220km	Approx. 18 hours

Road Condition: Of the 220 kilometers road from Djibouti port to the Ethiopian boarder, about 100 kilometers from Djibouti port are paved with asphalt and the remaining 120 kilometers are unpaved but not so bad road. The equipment will be safely transported.

Ethiopian border to Project sites	<u>Transportation</u>	<u>Distance</u>	<u>Day needed</u>
[ Addis Ababa site ]	Truck	850km	1 to 2

Road condition: The main road for transportation connecting Addis Ababa to Djibouti port is mostly paved with asphalt. The equipment will be safely transported.

[ Dire Dawa site ]	Truck	800km	1 to 2
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Road condition: Since the road construction work which was undergoing at the time of the Basic Design Study have been completed, the road from border to Dire Dawa is paved with asphalt. The equipment will be safely transported.

[ Harar in Oromia site ]	Truck	850km	1 to 2
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Road condition: Since the road construction work which was undergoing at the time of the Basic Design Study have been completed, the road from border to Oromia is paved with asphalt. The equipment will be safely transported.

[ Harar in Harari site ]	Truck	850km	1 to 2
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Road condition: Since the road construction work which was undergoing at the time of the Basic Design Study have been completed, the road from border to Harari is paved with asphalt. The equipment will be safely transported.

[ Mizan Teferi site ]	Truck	1,450km	6 to 7
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Road condition: The route goes through Addis Ababa, up to which the roads are paved. However, the road between Addis Ababa and Mizan Teferi is unpaved for the most part but not so bad condition. The equipment will be safely transported.

[ Semera site ]	Truck	100km	1
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Road condition: The site is situated on the paved main road connecting Djibouti and Addis Ababa. The equipment will be safely transported.

[ Mekelle site ]	Truck	900km	3 to 4
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Road condition: The road is mostly paved with asphalt except for short sections. However, about 400 kilometers between Dessie and Mekelle are the hardest part of mountain pass. Thus, careful driving shall be necessary for transportation.

Although the equipment for Gambella radio studio was carried by the container trailer on unpaved worst roads, there was no accident/trouble to the equipment due to the transportation.

From the experience, the equipment will also be safely delivered at this time, because the condition of unpaved roads is not so bad as observed in transportation of the equipment for Gambella radio studio.

### (3) Procedure of Customs Clearance and Duties

#### 1) Duties

In Ethiopia, all goods imported into the country even under grant aid are subject to import tax and surtax (15 %), which are to be borne by importers (beneficiaries).

The equipment procured and imported under this Project are all for the use by Regional

Education Bureaus, so that Regional Education Bureaus in consultation with regional governments shall appropriate a budget to bear this cost. Therefore, Ministry of Education and EMA shall instruct each regional government and Regional Education Bureau to make appropriations for this cost and also shall coordinate and manage a series of necessary procedures.

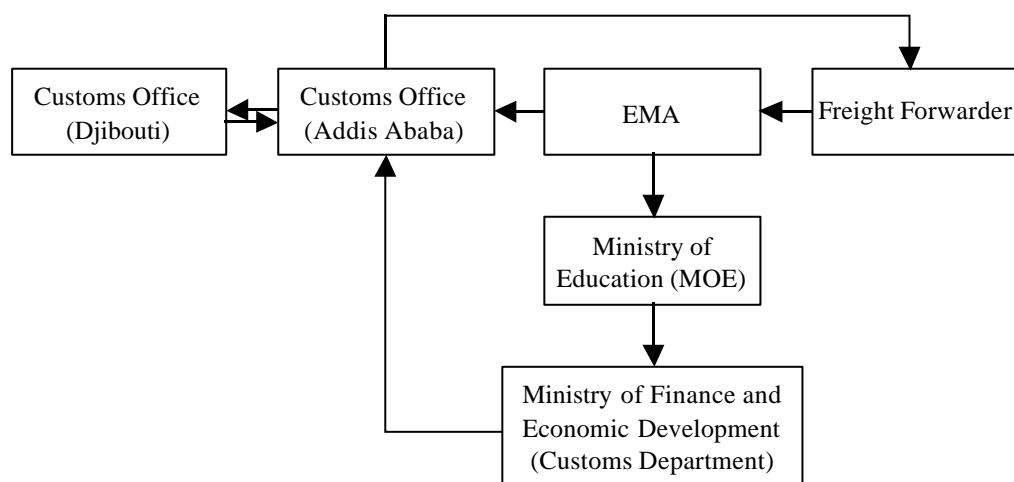
The current custom tariff rate of 5 to 80 % was established in Ethiopia in 1993.

#### **Tariff Rates ( Excerpt from 1993 publication )**

Item	Rate
Microphone, Speaker, Amplifier	20%
Record player, Cassette tape recorder, Open reel recorder	40%
VTR, Camera	80%
Audio recording tape, Video tape, Record	40%
TV set, TV monitor	40%
Signal Generator, Fuse	5%

#### 2) Procedure of Customs Clearance

The customs clearance procedure applied in implementation of the Project (Phase I) was as follows:



Submission of Authorization Letter (notification of appointed freight forwarder)

Issuance of Assessment Letter (inform the amount to be paid as the tax to the goods)

Submission of Liable Tax Estimate

Application of Liable Tax Amount (Liable tax amount will be paid from EMA's budget)

Issuance of Guarantee Letter for Liable Tax Amount (MOE guarantees the payment of liable tax.)

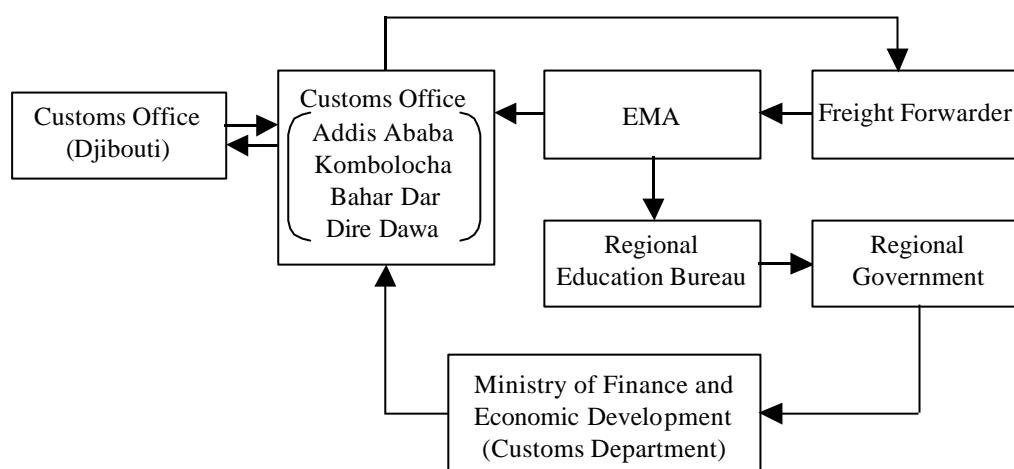
Delivery of Customs Clearance Documents

Delivery of Customs Clearance Documents and Release Order of the Goods

Final Inspection

Period for Customs Clearance: 16 days

The customs clearance procedure to be applied in this Project will be as follows:



Submission of Authorization Letter (notification of appointed freight forwarder)

Issuance of Assessment Letter (inform the amount to be paid as the tax to the goods)

Submission of Liable Tax Estimate

Application of Liable Tax Amount (Liable tax amount will be paid from REB's budget)

Issuance of Guarantee Letter for Liable Tax Amount (Regional Government guarantees the payment of liable tax.)

Delivery of Customs Clearance Documents

Delivery of Customs Clearance Documents and Release Order of the Goods

Final Inspection

At the time of implementation of the Project (Phase I), all the final customs inspections of the equipment were carried out at the customs office in Addis Ababa.

There are in all four (4) customs offices in the Ethiopian territory (at Addis Ababa, Kombolocha, Dire Dawa and Bahar Dar), where final customs inspection is taken place. As seven (7) project sites are scattered throughout the Ethiopian territory, final customs inspections of the equipment

will be taken place at a customs office located closest to the project sites out of four (4) customs offices.

The following three (3) kinds of documents will be required for customs clearance the same as the Project (Phase I).

- Bill of Lading
- Invoice
- Packing List

(4) Period Required for Transportation, Delivery and Customs Clearance

It took 53 days for transportation, delivery and customs clearance in implementation of the Project (Phase I).

Marine Transportation:	30 days
Customs clearance:	16 days
Inland transportation:	7 days
<hr/>	
Total	53 days

Considering the larger number of the project sites for this Project, that is seven (7) sites compared to three (3) sites of the Project (Phase I), the period of transportation and customs clearance in implementation of the Project is anticipated for at least 60 days.

## 2-2-4-7 Implementation Schedule

The Project implementation schedule is as follows;

- Detailed Design & Tendering : 3.5 months
- Equipment procurement and installation : 9.5 months

Total Period : 13.0 months

Month Stage	1	2	3	4	5	6	7	8	9	10	11	12
Detailed Design	<div><div></div></div> (Final confirmation on the contents of the Project)								(3.5 months in total)			
	<div><div></div></div> (Preparation of Tender Documents)											
	<div><div></div></div> (Approval of Tender Documents)											
	<div><div></div></div> (Tendering Period)											
	<div><div></div></div> (Tender Evaluation)											
Procurement/ Installation						<div><div></div></div> (Manufacturing)			(9.5 months in total)			
						<div><div></div></div> (Transportation)						
								<div><div></div></div>		<div><div></div></div> (Installation work and Handing over)		

: Works in Ethiopia

: Works in Japan

## **2-3 Obligations of the Ethiopian Side**

The obligations of the Ethiopian side in the event where the Project is implemented under the grant aid scheme of the Government of Japan are as follows.

- (1) Appropriation and payment of customs duties to be imposed on the equipment to be procured and imported into Ethiopia under the Project

All goods imported into Ethiopia, even those imported under grant aid, are subject to import tax and surtax (15 %), which are to be borne by importers. The regional governments and the Regional Education Bureaus, which are the recipients of benefits from this Project, need to appropriate a budget for this tax payment.

Ministry of Education and EMA shall coordinate and manage a series of necessary procedures on customs clearance making full use of their experiences of the Project (Phase I).

- (2) Acquisition of all the legal authorizations required at each region in Ethiopia

There was not any particular kind of legal approval or license, which is required in Ethiopia in connection with implementation of the Project, confirmed through the Basic Design Study and Implementation Review Study. However, in case new laws are enacted in the regional level, the contents and schedule of the Project may be affected. To avoid such prospect, the Regional Education Bureaus shall pay attention carefully the enactment trend in their regions and obtain new approval or license as the need arises as well as notify the Japanese side of such information.

- (3) Temporary storage for the equipment at the project sites

Temporary storage for the equipment to be procured under the Project at the project sites shall be secured and prepared by the Regional Education Bureaus. The storage shall be guarded by security personnel to avoid thefts and situated at such place as to protect the equipment from rain, wind and dust.

- (4) Budget and personnel for operation and maintenance of the equipment

The budget allocation of each Regional Education Bureau is assessed sufficient to spare the operation and maintenance costs for the equipment after the Project. The Regional Education Bureaus shall build up a better coordination with the regional governments to continue the allocation of present budget scale but not to be cut down on.

The Regional Education Bureaus have already had their own manpower for operation and maintenance of the equipment. The Regional Education Bureaus shall educate and train them as



well as to prepare a stable employment structure for them remaining long in service.

(5) Issue of authorization to pay (A/P) and payment of bank commissions

Concerning the bank commissions necessary for issue of authorization to pay and its amendment, the Ethiopian side shall prepare a sum equivalent to 0.1% of the total grant amount.

EMA had experienced and understood the matters concerning the A/P through the Project (Phase I) so that EMA should act as a contact agency for this time as well.

The bank in charge of the A/P issuance in the Ethiopian side is National Bank of Ethiopia.

(6) Execution of other undertakings of the Ethiopian side mentioned in the Exchange of Notes (E/N)

(7) Necessary technical measures to be undertaken by the Ethiopian side at each project site.

1) Addis Ababa Education Bureau Addis Ababa Radio Studio

- Provision of Electric Power Supply to the Studio Building
- Provision of a power cable (15m, 25A capacity) between the Power Distribution Board and the AVR in control room
- Provision of a power cable (40m, 10A capacity) between the Power Distribution Board and the AVR in CD Editing room
- Enlargement of a wiring hole between Studio floor and Control room to 80mm  $\phi$

2) Afar Regional Education Bureau Semera Radio Studio

- Provision of Electric Power Supply to the Studio Building
- Provision of a power cable (10m, 25A capacity) between the Power Distribution Board and the AVR in Control room
- Provision of a power cable (40m, 10A capacity) between the Power Distribution Board and the AVR in CD Editing room
- Enlargement of a wiring hole between Studio floor and Control room to 80mm  $\phi$
- Clean up each room before the installation work

- 3) Oromia Region East Hararege Zone Education Desk Harar in Oromia Radio Studio
- Provision of a power cable (10m, 25A capacity) between the Power Distribution Board and the AVR in Control room
  - Provision of a power cable (40m, 10A capacity) between the Power Distribution Board and the AVR in CD Editing room
  - Enlargement the a wiring hole between Studio floor and Control room to 80mm  $\phi$
- 4) Dire Dawa Regional Education Bureau Dire Dawa Radio Studio
- Provision of Electric Power Supply to the Studio Building
  - Provision of a power cable (15m, 25A capacity) between the Power Distribution Board and the AVR in Control room
  - Provision of a power cable (40m, 10A capacity) between the Power Distribution Board and the AVR in CD Editing room
- 5) SNNP Region Bench Maji Zone Education Desk Mizan Teferi Radio Studio
- Change of an existing power cable (approx. 10m) between the Power meter (WHM) and the AVR in Control room to a new power cable (25A capacity)
  - To cover the ground (soil) of the cable pit between Control room and CD Editing & Duplication Room by concrete or stones
  - Enlargement of a wiring hole between Studio floor and Control room to 80mm  $\phi$
- 6) Harari Regional Education Bureau Harar in Harari Radio Studio
- Provision of Electric Power Supply to the Studio Building
  - Provision of a power cable (25A capacity) between the Power Distribution Board and the AVR in Control room
  - Provision of a power cable (10A capacity) between the Power Distribution Board and the AVR in CD Editing room
  - Make a 80mm  $\phi$  wiring hole between Studio floor and Control room

7) Tigray Regional Education Bureau Mekelle TV Studio

- Increment of Receiving Electric Power Supply Capacity from present 25A to 65A
- Make a 20mm  $\phi$  wiring hole between Studio floor and Control room for lighting cable
- Procurement of VTR players to playback recorded VTR tapes at Mekelle Transmitting Station

The expenses the Ethiopian side has spent on the construction/modification of studio buildings in each project site, are as listed below.

Project Site	Construction / Modification	Cost (Birr)
Addis Ababa Radio Studio	Construction	1,000,000-
Semera Radio Studio	Construction	1,500,000-
Harar in Oromia Radio Studio	Modification	200,000-
Dire Dawa Radio Studio	Construction	1,200,000-
Mizan Teferi Radio Studio	Modification	86,000-
Harar in Harari Radio Studio	Modification	300,000-
Mekelle TV Studio	Modification	60,000-

### 2-4-1 Studio Operation and Maintenance Staff

The Regional Education Bureaus have the following manpower plans for the operation and maintenance of their studios after completion of the Project:

- These three (3) Regional Education Bureaus have already secured these radio program producers and production engineers at the time of the Basic Design Study. All these producers have been trained in EMA, while the production engineers have been trained also in EMA and in addition have field experience of program production using the analog equipment of EMA.

- Oromia Regional Education Bureau has retained six (6) radio program producers who have been trained in EMA and have a field experience of program production for Harar in Oromia radio studio. The radio program production engineers are scheduled to transfer from the Sendafa radio studio. There are fourteen (14) program production engineers employed in Sendafa radio studio at present. Three (3) of them will be transferred to Harar in Oromia radio studio. They have a field experience of program production in the Sendafa radio studio and are well aware of operation of analog equipment.

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- Mizan Teferi Radio Studio: Radio Program Producer: 6 persons  
Radio Program Production Engineer: 2 persons  
(Newly employed)

Also, the radio program producers of these two (2) Regional Education Bureaus have been trained in EMA and have a field experience of program production.

As newly employed after the Basic Design Study, the radio program production engineers know very little about program production. It was recommended in conclusion of the Basic Design Study report that at least three (3) program production engineers were necessary for smooth program production. Based on this recommendation, both REBs shall employ an additional radio program production engineer, respectively.

As described above, each Regional Education Bureau already retains sufficient number of radio program producers with ample experience in program production. When additional needs for radio program producers arise in the future for production of programs in new subjects, it is another possible way to get school teachers appointed as radio program producers by putting them through the radio program producer training course conducted yearly in EMA, that is considered better than to hire staff from fields other than educational circles.

Meanwhile, as regards radio program production engineers, almost all the engineers have experience of actual program production and have reached a certain level for operation of analog equipment. Since the operation method of digital equipment to be procured under the Project is basically the same as that of analog equipment, they will be able to produce programs by using digital equipment.

However, none of them have sufficient knowledge about digital technologies. It is necessary for them to go through the training on digital technology in advance for the smooth operation of equipment after the Project.

Contents of digital technology shall be as follows.

- ▶ Lecturer: one (1) Japanese expert
- ▶ Subject: Acquisition of basic knowledge on digital technology  
Acquisition of operation and maintenance method of digital equipment (mainly for the equipment operated on computer with software such as Audio Mixer, CD Editor, etc.)
- ▶ Equipment to be used for Training: Equipment in EMA procured under the Project (Phase I)

- Trainees: Radio program production engineers at Addis Ababa, Semera, Harar in Oromia, Dire Dawa, Mizan Teferi and Harar in Harari radio studios
- Duration: minimum 6 weeks  
2 weeks training for 6 engineers (3 engineers from 2 REBs) × 3 times

(2) TV Program Producer and Program Production Engineer

- Mekelle TV Studio: TV Program Producer: 14 persons  
(currently radio program producers)  
TV Program Production Engineer: outsourcing

It is planned that the radio program producers will play a role of TV program producers as well. Although the radio program producers have ample experience of radio program production, the process of TV program production is different than that of radio. It is necessary for the radio program producers to go through the TV program producer training course conducted in EMA. Meanwhile, as regards TV program production engineers, it is planned to fill the positions by outsourcing for the time being. There exist several private TV program production offices in Mekelle, producing TV programs for bulletins and other publications ordered from Tigray Region using professional type TV cameras. The technical capacities of the TV program production engineers of these private production offices are judged to be already at a certain level. Therefore, it is considered adequate for the TV program production engineers to be given a brief on-the-job training at the installation work of the new equipment procured under the Project.

(3) Maintenance Engineer

It is judged from the scale and contents of the equipment procured under the Project that program production engineers can play a role of maintenance engineers for the equipment as well in respective regions. It is therefore considered unnecessary to employ maintenance engineers separately.

## 2-4-2 Education and Training

Education and training of radio/TV producers and newly hired production engineers, as well as retraining of production engineers, have been conducted by EMA.

Radio/TV production training is carried out almost annually to the staff of Regional Education

Bureaus by the staff and retirees of EMA.

Number of trainees and the contents of past training programs (1996 - 2002) are described below:

(1) Radio Producer Training (6 weeks): 245 trainees

Education of radio producers (staff of Regional Education Bureaus and primary/secondary school teachers)

(2) TV Producer Training (6 weeks): 31 trainees

Education of TV producers (EMA staff and secondary school teachers)

(3) Radio Engineering Training: 130 trainees

- Operation/maintenance techniques of radio studio equipment
- Operation/maintenance techniques of radio transmission equipment
- Program editing techniques

(4) Distance Education Training: 152 trainees

Training of those with teaching license at the secondary school level for distance education programs

- Teaching course
- Textbook preparation course
- Textbook editing course

(5) Media Management Training: 198 trainees

Training of executive staff of Regional Education Bureaus and teachers about the usage of radio and TV media.

Almost all radio program producers and radio production engineers of the Regional Education Bureaus had been trained through the past training conducted in EMA.

EMA intends to revamp its training course of program production engineering from analog to digital technology.

Consequently, EMA is planning to set up new Digital Engineering training course by using the digital equipment procured under the Project (Phase I), lectured by EMA engineers, who had been trained through counterpart training in Japan and on-the-job training at the installation work of the Project (Phase I). EMA engineers have been familiar with the operation of the digital equipment, but

not been skilled enough to be the training instructors.

Therefore, it is recommended that the digital engineering training shall be carried out by Japanese experts dispatched through Japanese technical assistance scheme.

UNICEF, USAID, UNDP, and other donor organizations are actively involved in extending financial assistance to these training programs. To ensure their continuance, the Ministry of Education and EMA need to keep appealing to these organizations.

### **2-4-3 Maintenance System**

EMA's engineering staff have been accumulating various techniques and skills for 35 years since its establishment in 1965. They have the capability and know-how to handle a variety of situations concerning the operation and maintenance of analog equipment.

In addition, through communication with the engineers of ETV and Radio Stations, EMA studio engineers are acquiring a wide knowledge of the latest technologies and trends.

Periodic maintenance works of EMA are done in the manner described below:

(1) Preventive maintenance:

[ Every Day ]

Cleaning, check of power supply and visual inspection of the equipment

[ Once a Week ]

Oiling of the equipment, demagnetization of magnetic heads of recording equipment (tape recorders, cassette tape recorders, VTRs)

(2) Repair: Broken equipment is brought into the maintenance room for repair by replacing spare modules and parts.

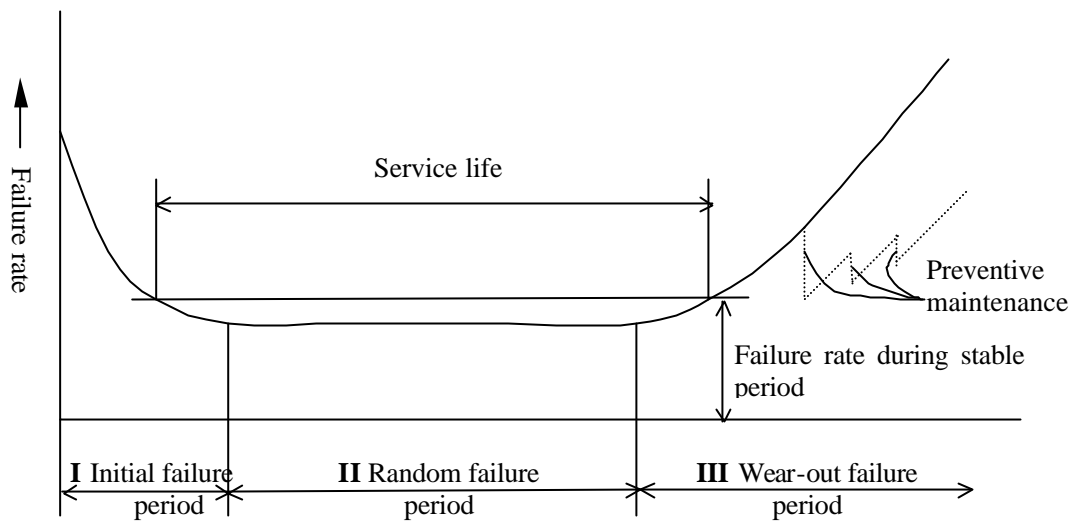
Records of operation and maintenance works are well kept. Monthly reports on the operation status of each equipment and maintenance work schedule are prepared and submitted to the Ministry of Education.

These steady efforts are the major factor in the sustenance of existing equipment and continuance of production activities despite the shortage or absence of spare parts.

Each Regional Education Bureau should also adopt the maintenance system of EMA.

For reference, changes in failure rate of program production equipment in relation to passage of time is shown below:





#### Initial Failure Period

Breakage occurring during this period originates in a defective lot or other initial defects. It is important to identify the cause and find solutions promptly.

#### Random Failure Period

When the initial failures are resolved, the failure rate stays at a low stable level until the beginning of the wear-out period. The service life of a machine is said to be the period from the time at which the failure rate drops below that provided for the equipment during the initial period and to the time at which the failure rate rises to that level again during the wear-out period.

#### Wear-Out Failure Period

Failure rate increases again after the random failure period. Failures during this period occur due to wear and tear of parts used in the equipment, which can be prevented while prolonging the service life of the machine by practicing proper preventive maintenance.

Although failure rate during the random failure period, which occupies most of service life, is relatively low at a stable level, a large variety of troubles occur at random. These troubles are most often caused by stresses created by improper operation or operating environment (temperature, humidity, etc).

#### 2-4-4 Operation/Maintenance Costs after the Implementation of the Project

Itemized below are operation/maintenance costs to be incurred after the implementation of this Project.

##### (1) Operation/Maintenance Costs

###### 1) Cost for hiring 3 new engineering staff members

- A diploma engineer (with 4 years of experience after graduating from vocational school)

$$835 \text{ Birr/month} \times 12 \text{ months} = 10,020 \text{ Birr/year}$$

- New employees (new graduates from vocational school)

$$600 \text{ Birr/month} \times 12 \text{ months} \times 2 \text{ persons} = 14,400 \text{ Birr/year}$$

Total (for 3 recruits): 24,420 Birr/year
--

###### 2) Production cost at Regional Education Bureaus

###### (a) Cost for producing programs for each subject is as follows:

- Script writing fees (In case school principals, etc are hired):

$$5,600 \text{ Birr/subject (28 programs per subject)}$$

- Performance fees:

$$\text{Teacher: } 146 \text{ Birr/subject}$$

$$\text{Students: } 50 \text{ Birr (10 Birr/subject} \times 5 \text{ persons on the average)}$$

Total: 5,796 Birr/subject
---------------------------

###### (b) Programs for the general public to be produced at Addis Ababa (226 programs per year)

- Script writing: to be done by the regional education bureau staff

- Performance fees

$$\text{Teacher: } 37.5 \text{ Birr}$$

$$\text{Other performers (3 persons): } 36.6 \text{ Birr}$$

$$(37.5 \text{ Birr} + 36.6 \text{ Birr}) \times 226 \text{ programs} = 16,746 \text{ Birr}$$

Total: 16,746 Birr
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(c) Programs for the general public to be produced at Harar in Harari  
(78 programs per year)

- Script writing: to be done by the Regional Education Bureau staff
- Performance fees

Teacher: 37.5 Birr

Other performers (3 persons): 36.6 Birr

$(37.5\text{Birr} + 36.6\text{ Birr}) \times 78\text{ programs} = 5,780\text{ Birr}$

**Total: 5,780 Birr**

### 3) Electricity Charges

Basic charge: 0.45 Birr/kW

Operation hours/month:	Production	100 hours/month
	Editing	80 hours/month
	Duplication	50 hours/month
	Maintenance	15 hours/month
	<b>Total</b>	<b>245 hours/month (estimate)</b>

Estimated power consumption/hour: 10kW

$245\text{ hours/month} \times 10\text{kW} = 2,450\text{kW/month}$

$0.45\text{ Birr/kW} \times 2,450\text{kW/month} = 1,102.5\text{ Birr/month}$

$1,102.5\text{Birr} \times 12\text{ months} = \mathbf{13,230\text{ Birr/year}}$

### 4) Maintenance Cost

Equipment to be procured under this Project uses solid state devices which, unlike vacuum tubes, do not require periodic replacement.

However, VTR heads and rotating parts of CD players and other parts that wear over time need to be replaced from time to time. Lamps, fuses, CDs, videotapes, and other expendable items also need occasional replenishment. As the recording medium is changed from tapes to CDs, the purchase cost of recording media will be reduced to about one third.

Since breakage will occur in daily operations, appropriations need to be made for maintenance and servicing.

Japanese broadcasting companies usually set aside 1% of the cost of equipment that they own as an annual maintenance cost. However, this amount is what is needed to broadcast programs on a 24 hours/day basis. Production companies, which do not broadcast live

programs, usually appropriate 0.5% of the equipment cost.

Thus, the Regional Education Bureaus presumably need to allow 0.5% of the cost of equipment to be procured under this Project for maintenance.

## 2-4-5 Operation/Maintenance Costs at each Studio

Operation and maintenance cost after the Project at each studio is examined as follows;

The necessary operation and maintenance cost at each studio is an amount expendable enough from the annual operation budget of each Regional Education Bureau allocated by each regional government.

### (1) Addis Ababa Radio Studio

#### 1) Production cost

Programs produced annually: 4 subjects  $\times$  2 grades = 8 subjects/year

Production cost: 5,796 Birr  $\times$  8 subjects = 46,368 Birr/year

Production cost of general public programs: 16,746 Birr/year

#### 2) Electricity charge: 13,230 Birr/year

#### 3) Cost of CDs: 25 Birr $\times$ 113 CDs $\times$ 3 = 8,475 Birr/year

#### 4) Maintenance cost: 6,600 Birr/year

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Total : 91,419 Birr/year

### (2) Semera Radio Studio

#### 1) Personnel cost of newly-hired engineers staff: 24,420 Birr/year

#### 2) Production cost

Programs produced annually: 5 subjects  $\times$  2 grades = 10 subjects/year

Production cost: 5,796 Birr  $\times$  10 subjects = 57,960 Birr/year

#### 3) Electricity charge: 13,230 Birr/year

#### 4) Cost of CDs: 25 Birr $\times$ 60 CDs $\times$ 3 = 4,500 Birr/year

#### 5) Maintenance cost: 6,600 Birr/year

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Total : 106,710 Birr/year

(3) Harar in Oromia Radio Studio

1) Personnel cost for newly-hired engineers:	24,400 Birr/year
2) Production cost	
Programs produced annually: 6 subjects $\times$ 2 grades = 12 subjects/year	
Production cost: 5,796 Birr $\times$ 12 subjects =	69,552 Birr/year
3) Electricity charge:	13,230 Birr/year
4) Cost of CDs: 25 Birr $\times$ 84 CDs $\times$ 3 =	6,300 Birr/year
5) Maintenance cost:	6,600 Birr/year
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Total :	120,082 Birr/year

(4) Dire Dawa Radio Studio

1) Production cost	
Programs produced annually: 6 subjects $\times$ 2 grades = 12 subjects/year	
Production cost: 5,796 Birr $\times$ 12 subjects =	69,552 Birr/year
2) Electricity charge:	13,230 Birr/year
3) Cost of CDs: 25 Birr $\times$ 84 CDs $\times$ 3 =	6,300 Birr/year
4) Maintenance cost:	6,600 Birr/year
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Total :	95,682 Birr/year

(5) Mizan Teferi Radio Studio

1) Personnel cost for newly-hired engineers:	24,400 Birr/year
2) Production cost	
Programs produced annually: 3 subjects $\times$ 4 languages $\times$ 1 grade = 12 subjects/year	
Production cost: 5,796 Birr $\times$ 12 subjects =	69,552 Birr/year
3) Electricity charge:	13,230 Birr/year
4) Cost of CDs: 25 Birr $\times$ 84 CDs $\times$ 3 =	6,300 Birr/year
5) Maintenance cost:	6,600 Birr/year
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Grand Total :	120,082 Birr/year

(6) Harar in Harari Radio Studio

1) Production cost	
Programs produced annually: 3 subjects $\times$ 2 grades = 6 subjects/year	
Production cost: 5,796 Birr/subject $\times$ 6 subjects =	34,776 Birr/year
Production cost of general public programs:	5,780 Birr/year

2) Electricity charge:	13,230 Birr/year
3) Cost of CDs: $25 \text{ Birr} \times 62 \text{ CDs} \times 3 =$	4,650 Birr/year
4) Maintenance cost :	6,600 Birr/year
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Total :	65,036 Birr/year

(7) Mekelle TV Studio

1) Personnel cost of newly-hired engineers:	24,400 Birr/year
2) Production cost	
Script writing:	5,600 Birr/subject
Performance fees:	teacher: 146 Birr/subject
	student: 50 Birr
	(10 Birr/subject $\times$ 5 performers on average)
Videotapes: $110 \text{ Birr} \times 20 \text{ rolls/subject} =$	2,200 Birr/subject
Total Production cost:	7,996 Birr/year
3) Electricity charge	
At the usage rate of 50 hours per month:	
$50 \text{ hours} \times 2\text{kW} = 100\text{kW/month}$	
$0.45 \text{ Birr/kW} \times 100\text{kW/ month} \times 12 \text{ months} =$	540 Birr/year
4) Maintenance cost:	8,300 Birr/year
5) Rental Cost (TV Transmitting Facilities of ETV Mekelle TV Station)	230,000 Birr/year
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Total :	271,236 Birr/year

## 2-5 Project Cost

In case this Project is implemented, the total project cost is estimated 261 million Japanese Yen. Details of project cost to be born by Japanese side and Ethiopian side estimated in accordance with the below conditions are as follows;

- (1) The project cost to be born by Japanese side

Project cost: approximately 196million Japanese Yen

Items		Cost (million Yen)
Equipment Cost	Addis Ababa Radio Studio	23
	Semera Radio Studio	23
	Hara in Oromia Radio Studio	23
	Dire Dawa Radio Studio	23
	Mizan Teferi Radio Studio	23
	Harar in Harari Radio Studio	23
	Mekelle TV Studio	25
Consultant fee		33

This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the grant.

- (2) The Project cost to be born by the Ethiopian side

Cost for construction/modification of studio building at each site:

Approximately 434.6 million Birr

- (3) Estimation conditions

- 1) Date of cost estimation: June, 2003
- 2) Exchange rate: 1US\$ = 119.37Japanese Yen  
1Birr = 14.72 Japanese Yen
- 3) Implementation period: refer to 2-2-4-7 Implementation Schedule