

JAPAN INTERNATIONAL COOPERATION AGENCY

No. 1

MINISTRY OF INFORMATION
REPUBLIC OF YEMEN

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
EDUCATIONAL BROADCASTING EQUIPMENT
IN
THE REPUBLIC OF YEMEN**

FEBRUARY, 1994

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PREFACE

In response to a request from the Government of the Republic of Yemen, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Educational Broadcasting Equipment in the Republic of Yemen and entrusted the study to the Japan International Cooperation Agency (JICA).

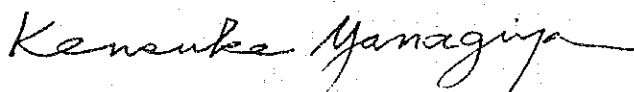
JICA sent to Yemen a study team headed by Ms. Chiho Muramatsu, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs and constituted by members of NHK Integrated Technology Inc., from August 17 to September 6, 1993.

The team held discussions with the officials concerned of the Government of the Republic of Yemen, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Yemen in order to discuss a draft report and the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Yemen for their close cooperation extended to the teams.

February 1994



Kensuke Yanagiya
President

Japan International Cooperation Agency

February 1994

Mr. Kensuke Yanagiya,
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

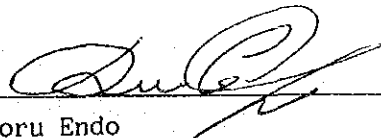
We are pleased to submit to you the basic design study report on the Project for Improvement of Educational Broadcasting Equipment in the Republic of Yemen.

This study was conducted by NHK Integrated Technology Inc., under a contract to JICA, during the period of August 12, 1993 to February 4, 1994. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Yemen and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

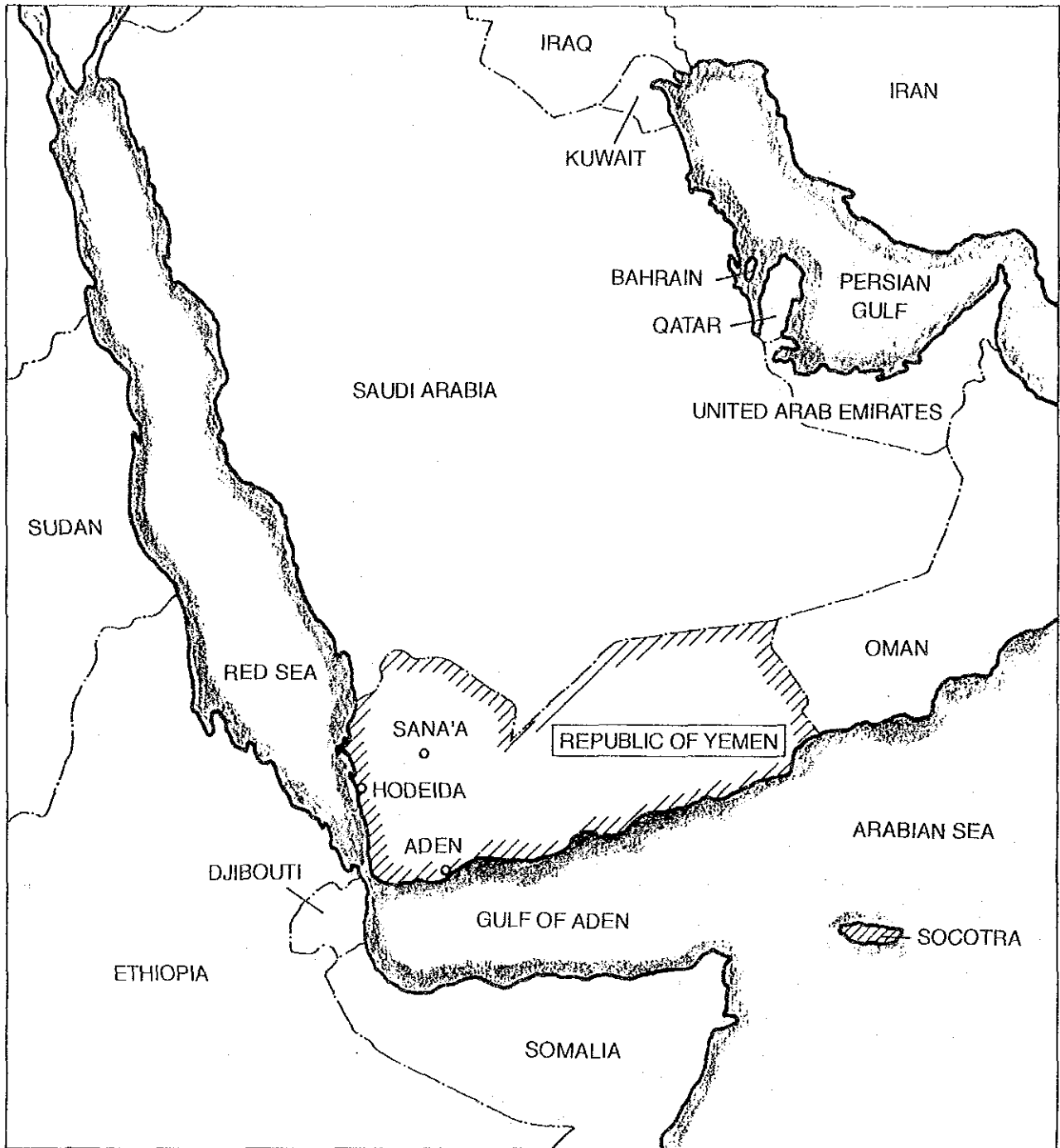
We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs, and the Ministry of Posts and Telecommunications. We would also like to express our gratitude to the officials concerned of the Ministry of Planning and Development, Yemen General Corporation for Radio and Television, the Embassy of Japan in Yemen for their cooperation and assistance throughout our field survey.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Toru Endo
Project manager,
Basic design study team on
the Project for Improvement of
Educational Broadcasting Equipment
NHK Integrated Technology Inc.



REPUBLIC OF YEMEN

Summary

Summary

The Republic of Yemen was established on May 22, 1990, when, after 20 years of negotiations, the former Yemen Arab Republic and the former People's Democratic Republic of Yemen agreed to unification.

The Republic of Yemen is situated at the southern tip of the Arabian Peninsula. It lies between 12 and 17 degrees north latitude, and between 42 and 53 degrees east longitude. It borders with Saudi Arabia to the north and with Oman to the east. It faces the African countries of Ethiopia, Djibouti, and Somalia across the Red Sea and the Gulf of Aden. The area of the country is 555,000 square kilometers (about 1.5 times that of Japan.)

According to an estimate by the Government of the Republic of Yemen, the population was 11.95 million (not counting those citizens who live outside the country) in 1992. Most of the people are Arabs. They speak Arabic and their religion is Islam.

The television broadcasting services of the Republic of Yemen are carried out by two networks, i.e., the Sana'a Television Station (Channel one) and Aden Television Station (Channel two) networks. Sana'a Station was once an organization of the television service in the former Yemen Arab Republic and Aden Station was part of the television service in the former People's Democratic Republic of Yemen. These services were inaugurated in 1975 and 1964 respectively.

Programs of Sana'a Station are transmitted through 28 transmitting stations (including 11 on-air relay stations) and those of Aden Station through 46 transmitting stations (including 37 on-air relay stations).

All transmitting stations combined are estimated to cover about 80 percent of the population.

About 2.2 million television sets are estimated to be in use in the Republic of Yemen and many people obtain various kinds of information useful for daily life from television broadcasting every day.

The top priority task of the new Republic of Yemen, which has come into being with the unification of North and South Yemen, is to achieve social and economic development. For this, the main resource which the country has, above all, is human resources, the most abundant on the Arabian Peninsula. But the literacy rates of the people are low (68.4 percent for men and 22.4 percent for women), the ratio of people receiving school education is also low (about 60 percent), and 75 percent of the population are living outside big cities. Considering these factors, the Government of the Republic of Yemen hopes to make the best use of television to disseminate information and educate and enlighten the people. The Government believes that the dissemination of information and education, and the wider spreading of cultural activities are prerequisites for social development.

In the Republic of Yemen, the Yemen General Corporation for Radio and Television is providing broadcasting services. But most of its production facilities are from 10 to 15 years old. Many of them are out of order or have suffered from considerable wear and tear. They are barely coping with the task of producing programs to cover the current

broadcasting time (59.5 hours for Sana'a Television Station and 56 hours for Aden Television Station.) It would be difficult to produce any more or better educational or informational programs using the facilities that are at hand.

It was with this situation in mind that the General Corporation for Radio and Television established a new studio center at its Sana'a Station. The center will be used to disseminate information on agriculture and industries, essential to everyday life, and to raise the standard of education of the people. Furnishing the new studio center with the necessary broadcasting equipment is an urgent task. However, the Government of the Republic of Yemen finds it difficult to procure the equipment to produce programs immediately because of a shortage of foreign currency.

Furthermore, it should be noted that sixty percent of the broadcasting equipment now in use are made in Japan and that the staff of Sana'a Station have accumulated a certain degree of know-how on the operation and maintenance of Japanese-made equipment.

To implement this project, therefore, the Government of the Republic of Yemen has made a request to the Government of Japan for grant aid cooperation.

In response to this request, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Educational Broadcasting Equipment in the Republic of Yemen. The Japan International Cooperation Agency (JICA) dispatched a basic design study team to the Republic of Yemen for 21 days from August 17 to September 6, 1993.

The following is an outline of the educational broadcasting equipment that has been chosen for the project based upon the results of the study.

Name of equipment	Numbers	Description
1. Educational program production studio equipment	one set	Equipment to produce programs of debate, panel discussions, commentaries, lectures, programs that require performances such as cooking, those to teach handicrafts or scientific experiments, programs of traditional arts, dancing, dramas (including skits to be inserted in educational programs), and those in which viewers take part.
2. Transmitting studio equipment	one set	Equipment to send out daily programs to transmitting stations according to on-air timetable, and to produce news, as well as short programs (introduction of programs to be broadcast, various kinds of announcements, etc.) between broadcast programs.
3. Master control room equipment	one set	Equipment to make final choice of programs to be sent to transmitting stations. Equipment to distribute video and audio signals coming in from outside and signals within the station to appropriate destinations, and to monitor the quality of those signals.

Name of equipment	Numbers	Description
4. Outdoor coverage equipment (1) VTR-Cameras and their accessories (2) Microwave link	(one set) three units one unit	Portable equipment to videotape materials for programs outside the station or to relay live from a location.
5. Editing equipment (1) 1:1 editing equipment (2) A/B roll editing equipment	(one set) two units one unit	Most basic equipment of electronic editing in which one VTR replays tapes and the other VTR edits and records. More advanced editing equipment in which taped materials on two VTR's are mixed, edited and recorded on one VTR.
6. Measuring equipment and tools	one set	Measuring instruments and tools to make periodical inspections of equipment, and to make readjustments or repairs, if necessary.
7. Spare parts	one lot	Spare parts sufficient for about two years after the start of operation (except consumables).
8. Installation materials	one lot	Materials for installation and connection of the equipment.

The term of the execution of the project is estimated as follows: 2 months for a consultancy agreement and for detailed design, 1.5 months for tendering and other necessary steps to reach a contract, 7.5 months for manufacture and transportation of equipment and 3 months for installing, adjusting and testing equipment.

The project cost to be borne by the Republic of Yemen is estimated at about 1.4 million Yemen rials.

The following effects are expected from this project:

- The new equipment will enable production of nine hours of educational programs a week. These will include programs on debate, panel discussions, analysis and commentaries, lectures, cooking, handicrafts, and experiments in science. They will also include skits to be used as part of educational programs and children participation programs. As a result, broadcasting hours at Sana'a Television Station will be expanded from the current 59.5 hours to 68.5 hours and those at Aden Television Station will be expanded from 56 hours to 65 hours. The projected reinforcement of educational, cultural and informational programs will contribute to higher educational and cultural levels of the people and to their welfare.
- Reporting crews will visit various parts of the Republic of Yemen to introduce different customs and habits to other parts of the country. Such programs are expected to contribute to mutual understanding among the people of Yemen.

- Functions, maneuverability, and reliability of equipment will increase. This will enable production and broadcasting of programs of better quality.
- Programs to be produced are estimated to benefit 80 percent of the population of Yemen or about 9.5 million people.

As stated above, the project is expected to contribute to a substantial degree to a better life for the people of Yemen. It will be of significant value for such a project to be implemented with Japanese grant aid cooperation.

Abbreviation List

Abbreviation List

ABBREVIATIONS

AC	:	Alternating Current
ADA	:	Audio Distribution Amplifier
AE	:	Audio Engineer
AUX	:	Auxiliary
BB	:	Black Burst
BC	:	Back Color
CAM	:	Camera
CB	:	Color Bar
CCD	:	Charge-Coupled Device
CCIR	:	International Radio Consultative Committee
CCU	:	Camera Control Unit
CD	:	Compact Disc
CG	:	Character Generator
CHG	:	Changeover Switch
CM	:	Color Monitor
CTR	:	Audio Cassette Tape Recorder
DSK	:	Downstream Keyer
DVE	:	Digital Video Effector
ENG	:	Electronic News Gathering
EXIST	:	Existing
EXT	:	External Source
FD	:	Floor Director
FPU	:	Field Pickup
FS	:	Frame Synchronizer
LD	:	Lighting Director
LOGO	:	Station Mark (LOGO) Generator
MAS	:	Master Control Room
MIC	:	Microphone
MK	:	Mix/Keyer
MON	:	Monitor
OB VAN	:	Outside Broadcast Van
OP	:	Operator
PAL	:	Phase Alternate by Line
PD	:	Program Director
PDA	:	Pulse Distribution Amplifier
PGM	:	Program
PRO ST	:	Production Studio
PVW	:	Preview
REV	:	Reverberator
RX	:	TV Receiver
SG	:	Sync Generator
SPK	:	Speaker
SS	:	Slide Scanner
SW	:	Switcher
TD	:	Technical Director
TEL	:	Telephone
TR	:	Open-reel Tape Recorder (audio)
TX ST	:	Transmitting Studio
UHF	:	Ultra-high Frequency
VCR	:	Video Cassette Tape Recorder
VDA	:	Video Distribution Amplifier
VE	:	Video Engineer
VEQ	:	Video Equalizing Amplifier
VHF	:	Very High Frequency
VSC	:	Vectorscope
VSW	:	Video Switcher
VTR	:	Video Tape Recorder
WFM	:	Waveform Monitor

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Chapter 1 Introduction

Chapter 1 Introduction

The Government of the Republic of Yemen hopes to use television broadcasting as a means to disseminate information and stimulate cultural and educational activities. It believes that these activities are prerequisites to promoting social development after the establishment of a new state. For this purpose, the Republic of Yemen's sole broadcasting organization, the Yemen General Corporation for Radio and Television, established a council on program production with the cooperation of the Ministry of Information and the Ministry of Education. The council is to offer recommendations on how to improve informational, educational and cultural programs. Also, a new studio center was built at Sana'a Station. The Government of the Republic of Yemen requested the Government of Japan to provide grant aid to help furnish the new studio center with the necessary equipment.

Upon receiving the request, the Government of Japan decided to conduct a basic design study for the requested project. The Japan International Cooperation Agency (JICA) dispatched a basic design study team headed by Ms. Chiho Muramatsu, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, to the city of Sana'a in the Republic of Yemen (hereinafter referred to as Yemen) from August 17 to September 6, 1993.

The study team conducted the site survey by consulting with officials of the Ministry of Information, the Ministry of Planning and Development, the Yemen General Corporation for Radio and Television, the Sana'a Television Station and other officials concerned.

While conducting the site survey, the team listened to information about and confirmed the background of the project, beginning with its adoption and leading to the request made for Japanese assistance, as well as the specific contents of the request.

Furthermore, the team surveyed the current status of the existing Sana'a Station and that of the new studio center. Then, the team discussed with Yemeni officials the specific scale and contents of the implementation of the project.

Following the site survey and return to Japan, the team conducted analyses and examinations which confirmed the suitability of the project as a project for Japanese grant aid, and made a basic design for the equipment necessary and most appropriate for implementing cooperation. The team then compiled a draft report, brought it to Yemen and explained it to the Yemeni concerned officials. This report has been compiled on the basis of the procedures taken as outlined above.

The member list of the study team, survey schedule, list of interviewees, minutes of discussions and other information are attached to this report in the Appendices.

Chapter 2 Background of the Project

Chapter 2 Background of the Project

2-1 Outline of TV and Radio Broadcasting and Other Mass Media

2-1-1 History of TV and Radio Broadcasting in Yemen

Before unification in 1990, South Yemen and North Yemen conducted broadcasting services under organizations independent of each other. Television broadcasting was carried out by Sana'a Television Station in North Yemen and by the Television Service of the Yemen People's Democratic Republic in South Yemen.

In addition, radio broadcasting services were conducted by Radio Sana'a in the north and by the Democratic Yemen Broadcasting Service in the south.

(1) Television Broadcasting

1) Sana'a Television Station

September 24, 1975 • Inauguration of black and white television

1975 broadcasting using the following facilities

Small studio (less than 100m ²)	one room
Telecine equipment	one set
2-inch VTR	one set
Film camera	several sets
Transmitter (50W)	one set

- The station started only with 11 employees including engineers and announcers.

1977 • A transmitting station was constructed on the Hill of Dhein north of the capital, Sana'a.

The transmitter had a capacity of 1,000 Watts covering the areas of Arhab, Amran, Raidah, and neighboring areas.

- 1978 ● Color television broadcasting was inaugurated.
- 1978~1981 ● Microwave networks were established from Sana'a to Taiz and Hodeida. New transmitting stations were constructed one after another, which remarkably expanded coverage areas of TV broadcasting.
- 1982~1989 ● Locally produced programs including dramas and artistic, educational and cultural programs were increasingly produced.
- A film laboratory and telecine equipment were installed.
- An emergency generator was installed.
- Transmission network was expanded.
- Video tape recorders using 1-inch tape were introduced in place of 2-inch VTR's.
- Modern U-matic VTR's and 1/2-inch VTR's were introduced.

2) Aden Television Station

- September 11, 1964 ● Aden Television Station was opened and television broadcasting in black and white was inaugurated.
- Only live programs consisting mainly of news and film programs were broadcast because no recording equipment was available.
- At first, the coverage area was limited to only the city of Aden but it was gradually expanded.
- 2-inch video tape recorders were purchased, which enabled programs to be recorded and exchanged with foreign countries.

- A number of cadres were sent abroad for training in various specialities to acquire more technical experience and knowledge.

January 1, 1979 • Aden TV Station was moved to a new station building where there were three studios.

- Two 2.5kW main transmitters were installed.

March 8, 1981 • Color television broadcasting was inaugurated.
 • An outside broadcast vehicle was introduced for the first time in television service.

- Three following studios were modified to have the capability of program production in color.

Studio No.1 150m² used with OB van
 for general purposes

Studio No.2 50m² two color cameras
 for educational, cultural
 and social programs

Studio No.3 30m² two color cameras
 for news and continuity of
 program transmission

June, 1981 • Satellites were utilized for telecasting.

1985 • The national microwave network was established to cover southeastern governorates by TV transmissions.

2-1-2 Outline of Television Broadcasting

(1) Organization of Yemen General Corporation for Radio and Television

When Yemen was unified as a state in 1990, the two broadcasting organizations in Sana'a and Aden were unified into one organization, the Yemen General Corporation for Radio and Television.

The General Corporation is an organization directly under the supervision of the Ministry of Information. It is the sole organization in Yemen in charge of all the broadcasting services from producing programs to their transmission to provide the information, education and culture considered necessary for the people of Yemen.

The General Corporation has a board of trustees which the chairman represents. Under the chairman is the director general. The director general has under his control seven divisions, one vocational school and seven sectors.

Figure 2-1-1 shows the organizational chart of the General Corporation for Radio and Television.

The following are the numbers of staff members by sectors and other divisions:

Channel 1 TV Sector (Sana'a TV Station)	314
Channel 2 TV Sector (Aden TV Station)	321
Administrative and Financial Sector	85
Engineering Sector	543
Economic Sector	16
General Program Radio Sector (Sana'a Radio Station)	140
Second Program Radio Sector (Aden Radio Station)	195
Local Branches	57
Legal Affairs, Public Relations and Other Divisions	194
<hr/> Total	<hr/> 1,865

In addition to the above, there are 252 people who are working on a contract basis at 74 transmitting and transposer stations.

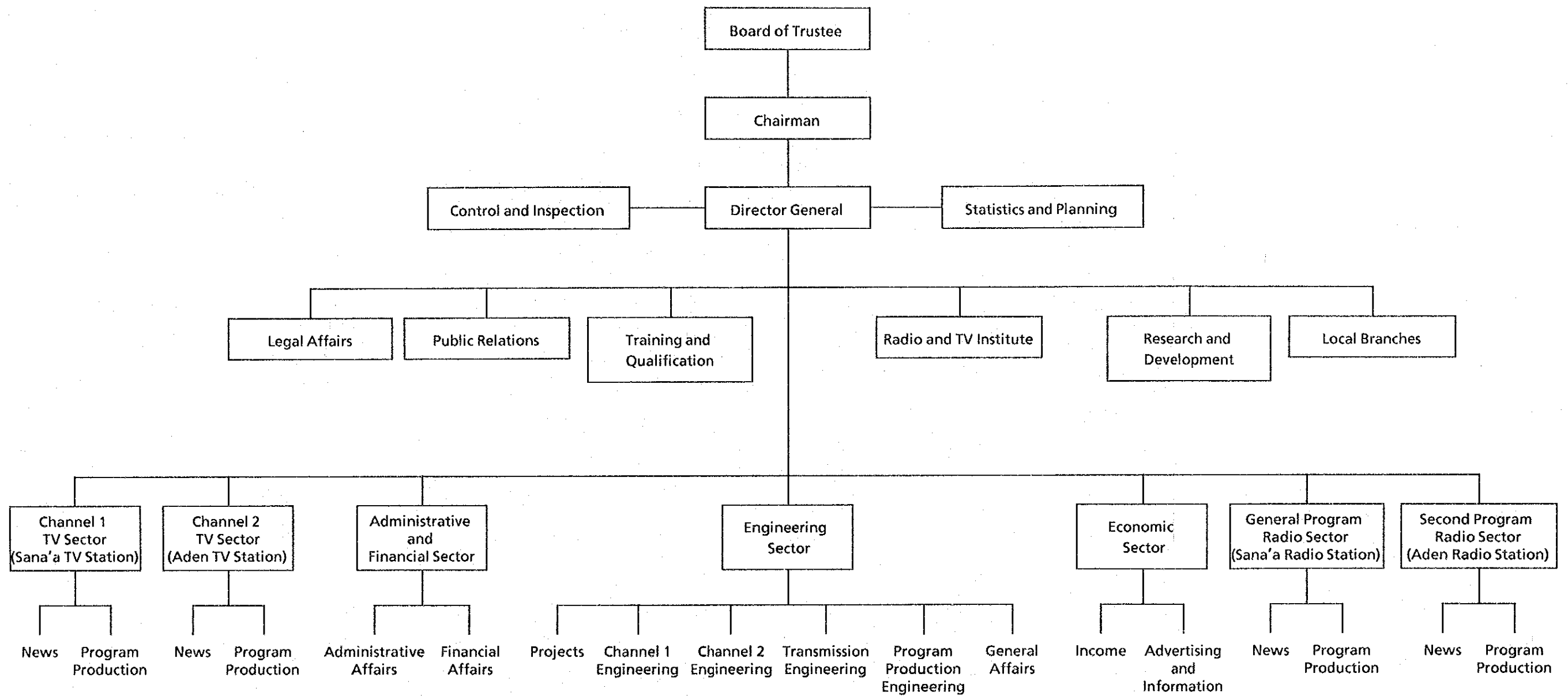


Fig. 2-1-1 Organization Chart of General Corporation for Radio and Television

(2) Financial status

The operating costs of the General Corporation are financed by advertisement fees, viewing fees from viewers, and state subsidies. The Corporation depends for more than 80 percent of its costs on the state budget. The financial situation is tight. The Corporation's budget for fiscal 1993 is in the red and so were the balances of the past two years. The Government has been covering the deficits.

Viewing fees are collected by the Public Power Corporation. As the Power Corporation collects its electricity charges, it collects an additional 10 rials from households that have television sets, and gives 8.5 rials to the General Corporation for Radio and Television. At present, viewing fees are collected mainly from households in urban areas. When the collecting system is consolidated, more income is expected from viewing fees.

Since the purpose of the project is to reinforce educational programs, not much of an increase in advertisement income can be expected even after the project has been completed. The Government of the Republic of Yemen considers this project as an important pillar of national development and sees it as a priority project. As such, the Government intends to cover possible increases in operational expenses after the completion of the project from the national budget.

Table 2-1-1 shows the Corporation's budget for fiscal 1993 and the financial balances of the past two years. Figure 2-1-2 is its graphic representation.

Table 2-1-1 Balance Sheet of General Corporation for Radio and Television

(in thousand rials)

Contents	Years	1991 (actual)	1992 (actual)	1993 (estimated)
Income				
Advertisement income		13,340	23,817	30,312
Viewing fees		16,000	25,820	34,688
National budget		225,189	232,437	328,400
Total income		254,529	282,074	393,400
Expenditure				
Personnel expenses		131,436	160,500	235,600
Programing expenses		44,352	33,100	45,000
Technical expenses		57,550	54,232	65,650
OB Van and building maintenance		10,727	9,000	15,000
Rental fee for microwave, etc.		8,400	10,100	14,000
Training		5,528	5,500	8,000
Furniture and fittings		2,500	2,000	5,200
Tax		15,668	17,580	21,000
Other expenses		11,114	12,191	13,300
Total expenditure		287,275	304,203	422,750
Balance		▲32,746	▲22,129	▲29,350

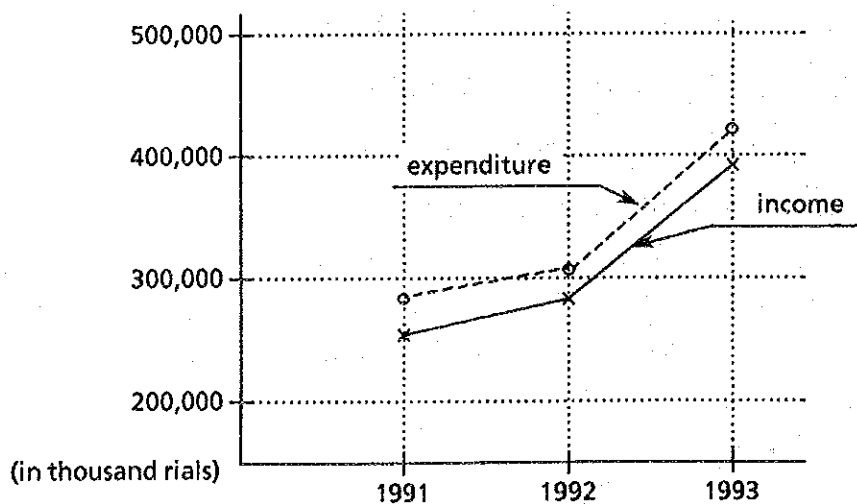


Fig. 2-1-2 Graphic Representation of the Balance

(3) Television programs

Sana'a Station is currently broadcasting about 59.5 hours a week. It broadcasts for an average of eight hours a day in the afternoon and evening for the five days from Saturday to Wednesday. On Thursday, the Station broadcasts about 8.5 hours. And on Friday, in addition to the regular 8-hour broadcast in the afternoon and evening, morning broadcasting services are conducted for three hours.

Aden Station is broadcasting 56 hours a week. It broadcasts 7.5 hours daily for the six days from Saturday to Thursday. On Friday, it broadcasts 11 hours.

Tables 2-1-2 and 2-1-3 show air timetables of the two TV stations from September to December in 1993.

The General Corporation periodically conducts surveys of viewers about programs broadcast. It tries to reflect viewers' voices and requests on subsequent program schedules as much as possible. Program schedules are revised every three to four months.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and financial management. The text highlights that records should be kept in a clear, organized, and accessible manner, allowing for easy retrieval and verification of information.

2. The second part of the document addresses the challenges associated with record-keeping, such as the volume of data, the complexity of transactions, and the need for standardized procedures. It suggests that implementing robust information systems and training staff can help overcome these challenges. The text also notes that regular audits and reviews are necessary to ensure the accuracy and integrity of the records.

3. The third part of the document focuses on the legal and regulatory requirements governing record-keeping. It outlines the specific rules and standards that must be followed, including the retention periods for different types of records and the procedures for archiving and disposal. The text stresses that compliance with these requirements is crucial to avoid legal penalties and ensure the long-term preservation of important information.

4. The fourth part of the document discusses the role of record-keeping in decision-making and strategic planning. It explains that historical data and trends can provide valuable insights into organizational performance and help identify areas for improvement. The text also notes that records can be used to track progress against goals and objectives, providing a clear picture of the organization's overall health and direction.

5. The fifth part of the document concludes by emphasizing the importance of a proactive approach to record-keeping. It encourages organizations to establish a culture of transparency and accountability, where record-keeping is seen as a key component of good governance. The text also suggests that regular communication and collaboration between different departments can help ensure that records are kept up-to-date and accurate.

Table 2-1-2 On-the-Air Timetable of Sana'a Station (Ch.1) from September to December, 1993

Day of the week Time	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday		
							pm	am	
15:00	Opening	Opening	Opening	Opening	Opening	Opening	Opening	8:00	
	Test pattern	Test pattern	Test pattern	Test pattern	Test pattern	Test pattern	Test pattern		Opening
16:00	National anthem and Religious period	National anthem and Religious period	National anthem and Religious period	National anthem and Religious period	National anthem and Religious period	National anthem and Religious period	National anthem and Religious period	9:00	
	News parade	News parade	News parade	News parade	News parade	News parade	News parade		Test pattern
	Program parade	Program parade	Program parade	Program parade	Program parade	Program parade	Program parade		National anthem and Religious period
	Parliament sessions or cultural and educational programs	Parliament sessions or cultural and educational programs	Parliament sessions or cultural and educational programs	Parliament sessions or cultural and educational programs	Parliament sessions or cultural and educational programs	Western film	Sports		Program parade
17:00								10:00	
								Children's program	
18:00	First children's period	First children's period	First children's period	First children's period	First children's period	First children's period		11:00	
	Prayer, Local news	Prayer, Local news	Prayer, Local news	Prayer, Local news	Prayer, Local news	Prayer, Local news	Prayer, Local news	Newsreel	
	Second children's period	Second children's period	Second children's period	Second children's period	Second children's period	Second children's period	Children's program	Local program	
	Educational program	Educational program	Educational program	Educational program	Educational program	Educational program	Educational program	Weekly drama series	
19:00	English news bulletin	English news bulletin	English news bulletin	English news bulletin	English news bulletin	English news bulletin	English news bulletin	12:00	
	Information, Advertisement	Information, Advertisement	Information, Advertisement	Information, Advertisement	Information, Advertisement	Information, Advertisement	Information, Advertisement		Koran
	*Local program	*Local program	*Local program	*Local program	*Local program	*Local program	*Local program		Signing-off of morning service
	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement		
20:00	*Local program	*Local program	*Local program	*Local program	*Local program	*Local program	*Local program		
	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement		
21:00	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement		
	Local drama	Local drama	Local drama	Local drama	Local drama	Arabic play	Arabic film		
22:00	Local drama	Local drama	Local drama	Local drama	Local drama	Arabic play	Arabic film		
	Drama series	Drama series	Drama series	Drama series	Drama series	Arabic play	Arabic film		
23:00	Drama series	Drama series	Drama series	Drama series	Drama series	Arabic play	Arabic film		
	Last news parade, Koran	Last news parade, Koran	Last news parade, Koran	Last news parade, Koran	Last news parade, Koran	Last news parade, Koran	Last news parade, Koran		
24:00	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off		
	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off		
01:00	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off		
	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off		

*Note: Local programs comprise those of education, public health and society, health care (tuberculosis prevention, etc.), family, agriculture, environment preservation, traffic safety, generation of today, sports, culture, science, introduction of various places of Yemen, development, etc.

Table 2-1-3 On-the-Air Timetable of Aden Station (Ch.2) from September to December, 1993

Day of the week Time	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday		
							pm	am	
15:00	Opening	Opening	Opening	Opening	Opening	Opening	Opening	8:00	Opening
	Test pattern	Test pattern	Test pattern	Test pattern	Test pattern	Test pattern	Test pattern		Test pattern
16:00	National anthem, Program parade, News parade	National anthem, Program parade, News parade	National anthem, Program parade, News parade	National anthem, Program parade, News parade	National anthem, Program parade, News parade	National anthem, Program parade, News parade	National anthem, Program parade, News parade	9:00	National anthem, Program parade, News parade
	Yemeni songs	Religious program	Sweet words	Religious program	Sweet words	Open program	Arabic film		Weekly Children's series
17:00	Parliament session	Parliament session	Parliament session	Parliament session	Parliament session			Arab drama series	Local news bulletin
	Arab drama series	Arab drama series	Arab drama series	Arab drama series	Arab drama series	Morning bulletin			
18:00	Local news bulletin	Local news bulletin	Local news bulletin	Local news bulletin	Local news bulletin	Local news bulletin	Local news bulletin	11:00	Arab drama series
	Prayer of Aden city	Prayer of Aden city	Prayer of Aden city	Prayer of Aden city	Prayer of Aden city	Prayer of Aden city	Prayer of Aden city		
19:00	Children's series	Children's series	Children's series	Children's series	Children's series	Children's series	Children's series	12:00	Islamic spirit, Koran
	Round the nation	Round the nation	Children's magazine	Children's magazine	Round the nation	Round the nation	English news bulletin		
20:00	English news bulletin	English news bulletin	English news bulletin	English news bulletin	English news bulletin	English news bulletin	English news bulletin	13:00	Signing-off of morning service
	French language	Sports varieties	English language	Football matches	Sports varieties	Screen and viewer	Sports magazine		
21:00	Documentary series	School program	Educational magazine		International events	International events	Educational instructions	News magazine	Main Arabic news bulletin, Advertisement
	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement		Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	Main Arabic news bulletin, Advertisement	
22:00	Sweet words	TV magazine	From here and there	Science world	Open discussion	From here and there, Program parade	Sweet words	Program parade	
	Program parade	Program parade	Program parade	Program parade	Program parade	Thursday night	Arab drama series		
23:00	Western film	Arab drama series	Arab drama series	Arab drama series	Arab drama series	Arab drama series	Arab drama series	World today, Evening present	
	World today, Evening present	World today, Evening present	World today, Evening present	World today, Evening present	World today, Evening present	World today, Evening present	World today, Evening present		
24:00	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	
	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off	Signing-off		
01:00									

Ratios of programs by category are roughly as follows:

Table 2-1-4 Kinds of Programs and Broadcasting Hours/Week

Programs	Sana'a Station (Ch.1)		Aden Station (Ch.2)	
	Air time (Min.)	Ratio (%)	Air time (Min.)	Ratio (%)
Educational & cultural programs	1,305	36.5	840	25.0
Dramas & movies	900	25.2	985	29.3
News	440	12.3	515	15.3
Children's programs	370	10.4	550	16.4
Religious programs	145	4.1	195	5.8
Sports	120	3.4	180	5.4
Others (advertisements, announcements, etc.)	290	8.1	95	2.8
Total	3,570 (59.5 hours)	100	3,360 (56 hours)	100

Both Sana'a Station and Aden Station produce about 60 percent of their programs locally. The remaining 40 percent of programs are imported mainly from neighboring Arab countries. An animation program from Japan is being aired as one of the children's programs.

The two Stations mutually exchange news and some other programs. The exchanged programs account for about 13 percent of broadcast time for Sana'a Station.

(4) The current situation at Sana'a Television Station (Channel One)

The administrative and managerial division of the General Corporation for Radio and Television is situated at the center of the city of Sana'a. Studio and other production facilities are standing on a small hill in the suburbs of the city. The new studio center has been built on the same premises.

The existing facilities include a production studio (350m²), a transmitting studio (60m²), master control room, editing facilities, OB vehicles, self-operating microwave links, transmitting facilities for Aden programs (Ch.2) and facilities to receive satellite transmissions.

Many items of equipment are from 10 to 15 years old. Some are out of order, and are not fit for use. Others may be in use but are not working well. Appendix 5-2 has a list of the main existing equipment and Appendix 5-3 has a layout of the present studio building.

Outline of existing facilities and equipment:

1) Studio No.1 (production studio) equipment

The studio has three cameras manufactured in 1979. All three are out of order and are not fit for repair. A simple camera made in 1989 by Ampex is the only camera that is barely working. When a large scale program is produced, production is made by the method called, "OB van drive". Cameras on OB vehicles are brought in, and other OB vehicles' equipment is also used.

The ceiling is high (about 10 meters). As for studio lighting equipment, manually-operated suspension lighting apparatuses are installed.

There is a video switching device made in 1979. But it has suffered from wear and tear and is not functioning well. There are not enough special effect apparatuses such as those capable of

creating montage effects and other effects that have been considered necessary for the production of television programs in recent years.

The sound mixer is rather new and is still fit for use. It is a product of Digitec and was procured in 1989.

Many of the monitors were made around 1979, and their quality level has been reduced. They are not adequately functioning as monitors of video signals.

Part of the control room is partitioned and is being used as an editing area with a 1/2-inch VTR editing system (made by Sony) that was donated from Japan in fiscal 1990 as grant aid. This editing system is being fully utilized and staff practically have to wait in line to use it.

2) Studio No.2 (transmitting studio) equipment

Two Marconi-made cameras (1979) and two Bosch-made portable cameras (1984) are installed. The Marconi cameras are no longer functioning, like those in the production studio. The two Bosch portable cameras are doing all the work.

Other video and audio equipment are about the same as those in Studio No.1. They are old and have been subject to wear and tear through use over many years. Especially, the sound mixer made in 1975 is in bad condition.

All the daily programs, including news programs, are being sent out to the transmitter from this studio. But the studio has many problems. For one thing, it does not have devices to obtain chromakey effects, which are indispensable to make news programs. Also, it has no caption scanners nor electronic character generator, and therefore, no letters can be superimposed on to the screen.

3) Master control room equipment

The facilities include a routing switcher to supply signals in and out of Sana'a Station to studios or VTR's, a master switcher to make the final choice of programs to send to transmitting stations, a sync signal generator, and monitoring equipment.

Except for the Bosch-made routing switcher that was purchased in 1990, most of the other devices were installed from 1979 to 1980.

4) VTR room equipment

All sizes of video tapes and different formats of tape recorders are used in the VTR room. There are in all ten VTR's: two 2-inch VTR's, two 1-inch B-format VTR's, two 1-inch C-format VTR's, two 3/4 inch U-matic VTR's, and two 1/2-inch Betacam VTR's. They are used to send programs recorded on tapes of each type of VTR, or to mutually convert tapes of different types of VTR's. The 2-inch VTR's are made by Ampex. It is difficult to obtain spare parts for them and they are especially timeworn.

The 1-inch B-format VTR's were purchased from Bosch in 1986. The C-format VTR's were purchased from Sony in 1986 and 1990. These 1-inch VTR's will be moved to the new studio center and will continue to be used.

(See Photograph 2-1-1)

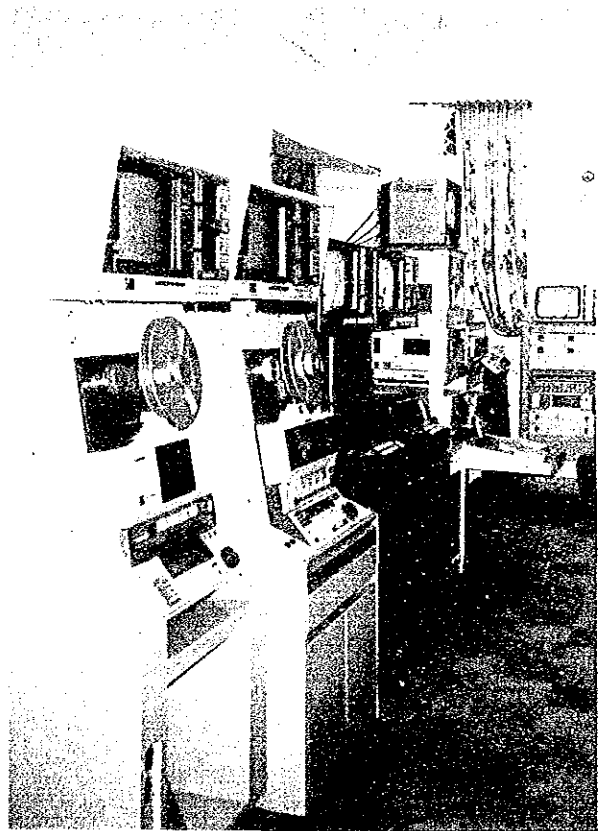


Photo. 2-1-1 One-inch VTR

In this photograph, in the forefront are seen 1-inch C-format VTR's. Behind them are 1-inch B-format VTR's.

The U-matic and Betacam VTR's were installed in 1989. They are made by Sony. Those VTR's that were bought in 1989 and later are all in good working condition.

5) Editing equipment

There are six editing rooms in all. One of the editing rooms, as was mentioned before, is in a partitioned area of the production studio control room. One set of the latest editing equipment is installed in that partitioned area. The following are summaries of each of the editing rooms.

- Editing Room No.1

The room has 1:1 editing equipment with two Ampex-made 1-inch VTR's. They were installed about ten years ago and are not in good working condition.

- Editing Room No.2

The room has Sony-made editing equipment with two 1/2-inch Betacam VTR's and one 3/4-inch U-matic VTR, which were installed in 1989. They are relatively new and are in good working condition. This room has an A/B roll editing system including the above-mentioned three VTR's, a video switcher, a sound mixer, and an editor.

- Editing Room No.3

The room has one set of 1:1 editing equipment consisting of two 1-inch B-format VTR's (made by Bosch) and another set of 1:1 editing equipment consisting of one U-matic VTR and one 1/2-inch VTR.

The B-format editing equipment were installed in 1981, and the U-matic and 1/2-inch VTR editing equipment were installed in

1984. But perhaps because it was used more often, the 1/2-inch VTR's are more worn out.

• Editing Room No.4

Functionally, this room has A/B roll editing equipment like Editing Room No.2. But the 1/2-inch VTR is made by BTS (a joint venture of Phillips and Bosch). It was installed in 1989.

• Editing Room No.5

This has rather new equipment installed in 1990. The room has one set of 1:1 editing equipment with two U-matic VTR's and another set of 1:1 editing equipment with two 1/2-inch VTR's

• Editing Room No.6 (Editing area inside the production studio control room)

This is the most up-to-date editing equipment provided by Japan as cultural grant aid in 1990. The A/B roll editing equipment comprises three 1/2-inch VTR's, a video switcher, a sound switcher, and an editor.

6) Outside broadcast vehicle

Sana'a Station has two middle-size OB vehicles and one small-size OB vehicle. The small-size vehicle was originally carrying black-and-white equipment. In 1989, Sana'a Station replaced them with color TV equipment. At present, the vehicle is mainly used to produce and record programs in the production studio.

Both of the two middle-size OB vehicles were purchased at the beginning of the 1980's. One of them is especially superannuated. But the two are used every day for covering news, and relaying soccer matches or debate programs in which students take part.

7) Outdoor coverage equipment

In all, there are 14 units of electronic news gathering (ENG) equipment. They are: four ENG's with U-matic VTR combined cameras, an ENG unit with 1-inch VTR combined cameras, and nine ENG's with 1/2-inch VTR combined cameras. All were purchased in 1984 or later. Two ENG units with 1/2-inch VTR's and two cameras were provided by Japan in fiscal 1990.

8) Film developing machine and telecine equipment

Recently, film developing machines are disappearing from the facilities of broadcasting stations. But at Sana'a Station three film developing devices are still in full operation every day. They were procured in and after 1983.

In covering news, not only ENG cameras but also about 20 film cameras are being used. The film developing devices are necessary to develop films from such cameras every day. (See Photograph 2-1-2)

There are three sets of telecine devices to broadcast these news films or movies. Two of them are out of order and only one is operating.

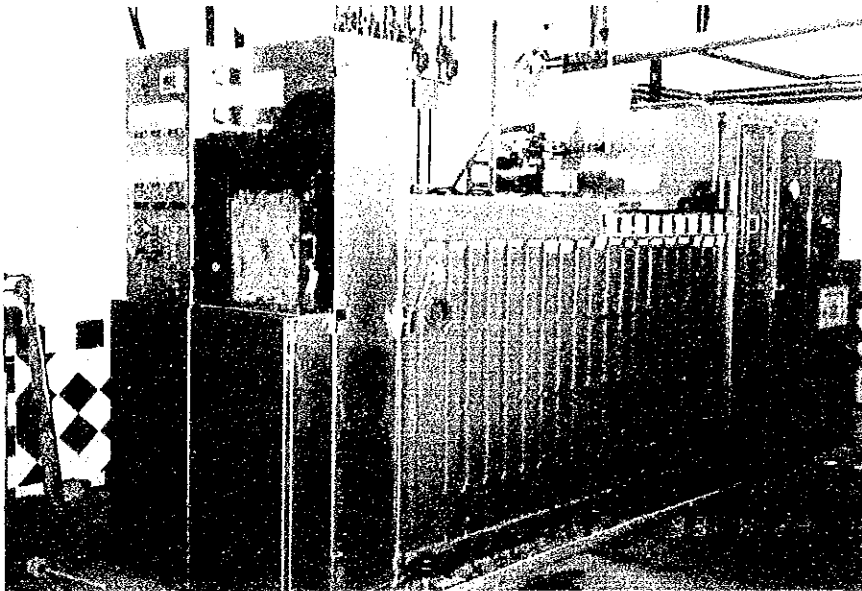


Photo. 2-1-2 Color Film Developing Machine

9) Other facilities

a) Self-sustaining microwave equipment and transmitting equipment

In the microwave room are 6GHz microwave terminal equipment which send Sana'a Station programs (Ch.1) to the transmitting network of Sana'a Station, and a 500W transmitter to broadcast Aden Station programs (Ch.2) to Sana'a City areas. In Sana'a City, Sana'a programs can be received on Channel 7, and Aden Station programs on Channel 5.

Appendix 5-4 shows a schematic diagram of microwave link and transmitting equipment at Sana'a Studio Center.

b) Satellite reception room

Sana'a Station is getting programs from Egypt, Abu Dhabi and other neighboring Arab countries and news programs from CNN, via Arabsat, Intersat, and other satellites. Also, depending on needs, it is distributing programs from Yemen throughout the world by way of Yemen Telecom.

c) Emergency generator

There are one 500kVA generator and two 125kVA generators. They are used when city power is interrupted. These emergency generators are used almost every day, as power generated by the Power Corporation is in short supply and electricity is often cut, especially in the evening.

(5) Transmitting equipment

Programs of Sana'a Station are transmitted through a transmitting network of 28 stations. Among the 28 stations, 17 are transmitters linked with microwave circuits. The remaining 11 are transposers which receive propagation waves from other stations and retransmit. The General Corporation predicts that all this covers 65 percent of the population and 70 percent of the national land area.

Programs of Aden Station are broadcast using 9 transmitting stations and 37 transposers. One of the 9 transmitters is installed in Sana'a Station where it is broadcasting by 500W with the combination of a transmitter and a transposer. The transmitting network of Aden Station is estimated to be covering 40 percent of the population and 35 percent of the national land area.

Sana'a Station and Aden Station combined are estimated to cover about 80 percent of the population.

Appendices 5-5 and 5-6 carry lists of the transmitting stations of Sana'a Station and Aden Station respectively, 5-7 has a conceptual drawing of service area, and 5-8 show the television network.

(6) Diffusion of television sets

Yemen does not require registration of television sets, and this poses some difficulties in assessing how many television sets are in use. The General Corporation estimates that more than 2.2 million sets are in use. According to customs statistics, about 2.2 million sets have been imported. There may also be a number of sets that have been brought into the country outside regular import channels. The number of such television sets is thought to be greater than the number of those among

the legal 2.2 million that are now unfit for use after reaching the end of their service life.

In Yemen, many television sets are in use in those areas where television waves can reach. This is because the people of Yemen tend to spend more time indoors due to Yemen's environment and customs. It is also difficult, except for those who live in urban areas, to get hold of reading materials. Consequently, many people obtain various kinds of information and entertainment from television broadcasting.

The price of a color television set in Yemen is about 13,000 rials for a 14-inch set and about 18,000 rials for a 20-inch set. The price for a 14-inch set is roughly about the same as the pre-tax monthly income of a male university graduate in the first year of employment.

2-1-3 Outline of Radio Broadcasting

Like television broadcasting, radio broadcasting is carried out by the Yemen General Corporation for Radio and Television.

Sana'a Radio Station opened in 1946, and Aden Radio Station was opened in 1954. Both of them have been in service ever since.

The two stations are broadcasting a combined total of about 32 hours a day on an average. The General Corporation estimates that 95 percent of the population is covered.

2-1-4 Other Mass Media

(1) Newspapers and other journals

Three newspapers published in Yemen:

Al-Thawarah	35,000 copies
14th October	15,000 copies
Al-Jomhoriyah	10,000 copies

Five weekly magazines:

26th September	19,000 copies
Al-Wahda	15,000 copies
Alryathah	13,000 copies
Alrayah	12,000 copies
Alhares	8,000 copies

Four monthly magazines:

Nashrat Alaalam Alskany	5,000 copies
Thaqr Alyyamn	5,000 copies
Nashrat Alamanh	5,000 copies
Masara Alyamn	3,000 copies

In addition, 15 other different weekly, biweekly, monthly and seasonal magazines are published. Their total circulation is about 131,000.

(2) Movie theaters

There are 45 movie theaters in eleven governorates (including the Sana'a Metropolitan Area). A total of about 8.3 million people are estimated to have gone to movie theaters in 1992.

2-2 Outline of Related Development Plan

2-2-1 Related National Development Plan

The former Yemen Arab Republic had compiled the third five-year plan for the years from 1987 to 1991, and had begun to implement it. It had the following as its goals:

- ① A deep concern for the cultural and spiritual life of the citizen, including the preservation of Islamic values, the dissemination of Islamic doctrine and the strengthening of educational and cultural institutions.
- ② Working for the unification of both Yemens, by building a closer relationship, strengthening the foundations of economic and social integration and seeking further joint action in all areas, namely in industrial development and the use of natural resources.
- ③ To make optimum use of available resources, and to continue to search for other resources, and to use them for the welfare of the country. Top priority will give to the increase of production and productivity, and to a better distribution of income.
- ④ To complete the infrastructure of the country and to implement various projects in commodity-producing sectors, namely in: (a) agriculture and fishing, mining and energy, and manufacturing industries using local ores and raw materials; (b) general education, vocational and technical training; (c) health care and prevention.
- ⑤ To improve the oil export system.

etc.

Programs in the field of information and cultural services in the third five-year plan called for using radio and television to develop human resources. They also called for using audio and visual apparatuses to encourage expansion of production. It is said that by using these media, the government should raise the awareness of the people about agricultural production, health issues and literacy, among others.

In 1990, the former North and South Yemen were unified to establish the Republic of Yemen. The new country has yet to compile a new development plan as a unified country. The Government of the Republic of Yemen says it will seek a national consensus by about the beginning of 1994 and that it then will compile a new development plan based upon such a consensus. The next five-year plan appears likely to cover the period from 1996 to 2000.

2-2-2 Development Plan of Radio and TV Sectors

To achieve the above-stated goals, the radio and television divisions had the following plans.

- ① To expand the national transmitting network of television
- ② To purchase outside broadcast vehicles and outdoor coverage equipment for live telecasting of various activities such as religious and national ceremonies, sports and youth festivals.
- ③ To complete film developing laboratories.
- ④ To expand the radio transmitting network using medium and short waves, and to expand overseas broadcasting service by the use of short waves.
- ⑤ To build the radio headquarters.
- ⑥ To expand the television headquarters.

A plan to expand the Sana'a Station's studio center was referred to in the old third five-year plan.

2-3 Background and Contents of Request

2-3-1 Background of Request

Since the Republic of Yemen was established in May of 1990, its most important task has been to achieve social and economic development, making the best use of its human resources, which are considered to be the most abundant on the Arabian Peninsula. To achieve this goal, it is necessary to raise the standards of education and knowledge of the general public. But Yemen faces the problems listed below when it works on the dissemination of information to the public and works to expand cultural and other activities to enlighten the public.

- ① Low literacy rates (According to statistics in 1992, the literacy rate of the people on average was 45.1 percent. That for men was 68.4 percent, and for women 22.4 percent.)
- ② Teaching materials for general education are in short supply and their quality is low.
- ③ Information related to everyday life is insufficient.
- ④ There are disparities in the levels of education and knowledge among the public.
- ⑤ Sufficient good teachers are not immediately available.

Yemen's population has increased since the unification of North and South Yemen. But 75 percent of the people live outside urban areas. Under this situation, television is considered one of the effective ways to overcome the above-stated problems.

Yemen has only one broadcasting organization, the Yemen General Corporation for Radio and Television. Most of its television production facilities are 10 to 15 years old. Many of them are out of order or superannuated. With those facilities, the Corporation is just barely filling the current air time (59.5 hours at Sana'a Station and 56 hours at

Aden Station). It would be difficult for the Corporation to produce more educational and informational programs with the current facilities.

To improve this situation and to give the public more information essential for everyday life and raise the educational standards of the public, the Corporation built a new studio center at Sana'a Station. It is now urgent to furnish the new studio center with the necessary equipment. But it would be difficult for The Government of the Republic of Yemen to provide such equipment to produce programs, because such equipment is not available in Yemen and there is a shortage of funds in foreign currencies.

The Government of the Republic of Yemen has requested the Government of Japan to provide grant aid cooperation for the improvement of educational equipment to produce educational programs. Japan was an obvious choice, as 60 percent of the existing equipment are made in Japan and the technical know-how to use those equipment has been accumulated.

2-3-2 Contents of Request

The request from Yemen is for television broadcasting equipment to be installed at the new studio center built on the premises of Sana'a Station and for outdoor coverage equipment. The request consists of the following items:

- | | |
|---|---------|
| (1) Educational program production studio equipment | one set |
| (2) Transmitting studio equipment | one set |
| (3) Master control room equipment | one set |
| (4) Outdoor coverage equipment | one set |
| (5) Editing equipment | one set |
| (6) Measuring equipment and tools | one set |
| (7) Spare parts | one lot |
| (8) Installation materials | one lot |

Chapter 3 Outline of the Project

Chapter 3 Outline of the Project

3-1 Objective

The Government of the Republic of Yemen hopes to use television broadcasting as an important medium for building a truly unified nation and to improve the people's welfare. Especially, it is considering the use of television broadcasting for the following purposes:

- ① To provide educational and enlightening programs for children, young people and women
- ② To provide training programs for teachers
- ③ To carry out campaigns to promote public morals, traffic safety, etc.
- ④ To disseminate technology and information on agriculture, industries and fisheries
- ⑤ To disseminate knowledge about health, medical care and hygiene
- ⑥ To promote mutual understanding among the public by introducing various parts of the country to the people
- ⑦ To provide social information by reporting on news in and outside the country and by broadcasting documentary programs
- ⑧ To diffuse and to preserve traditional culture and arts
- ⑨ Publicity for the Government

However, the existing TV broadcasting facilities have not been playing their roles in full owing to equipment shortages, superannuation and inadequate functions.

To improve the situation, the Yemen General Corporation for Radio and Television has built a new studio center, next to the existing building at Sana'a Station.

The objective of the project is to furnish the new studio center with up-to-date equipment to make more and better programs, so that the TV broadcasting services may become able to play the above-mentioned roles in full.

3-2 Study and Examination of the Request

3-2-1 Appropriateness and Necessity

(1) Goals of the Yemen General Corporation for Radio and Television

Having in mind the roles the Government of the Republic of Yemen has for television broadcasting, as is stated in 3-1 above, the Corporation has set out the following goals:

- 1) To fulfill the basic needs of the people of Yemen and contribute to the improvement of the standards of education and knowledge, by providing the various kinds of information stated in 3-1 above
- 2) To improve program producing facilities to increase broadcasting time by nine hours a week and to improve the quality of programs

As the first step to achieve these goals, the Corporation constructed a new studio center next to the existing studio building of Sana'a Station.

But it is difficult in Yemen to obtain the television broadcasting equipment needed to be installed into the new studio center. In addition, Yemen lacks foreign currencies and, therefore, has requested Japan to provide grant aid cooperation.

Next, the appropriateness of the equipment requested is studied item by item in light of the above goals strived for by the Corporation.

- The Corporation is aiming at using television broadcasting to provide a source of information in order to improve the people's way of life. When various conditions in Yemen are considered, this goal is thought to be appropriate.

There are grounds to believe that television can play a large role in the people's lives. The people in Yemen tend to spend more time indoors due to the living environment and social habits. In addition, it is difficult for people living outside urban areas to

obtain reading material. And at present, about 75 percent of the population live outside urban areas.

This explains the high ratio of television set ownership among the people. According to an estimate by the Corporation, about 2.2 million television sets are in use across the country at present. That is a ratio of one set for every 5.4 people on an average. It is a very high diffusion rate.

This also means that television broadcasting can play an important role in disseminating various kinds of information necessary for the people's everyday lives. As the present transmitting network is estimated to cover 80 percent of the people or about 9.5 million people, television broadcasting can also work as an important source of information for education and enlightenment, which is necessary for raising the people's level of knowledge.

From this, the Corporation's goal to use television broadcasting as a source of information is considered appropriate.

- The second goal to furnish the new studio center with up-to-date equipment is also considered appropriate.

At Sana'a Station, there is at present only one studio for producing programs. Many items of the equipment there are from 10 to 15 years old. Most of them are old or superannuated and are not functioning well. They are also insufficient in number. With only these facilities, it is difficult to make more educational programs or to provide more air time for educational programs.

In summary, the goals of the Corporation as stated in (1) 1) and 2), are considered appropriate because of the reasons stated above.

(2) Current situations and problems

1) Expanding the production of programs

The Corporation is planning to increase the air time of educational programs by nine hours both at Sana'a Station and Aden Station. Sana'a Station is currently transmitting 59.5 hours of programs and Aden Station, 56 hours.

But Sana'a Station has only one program producing studio. In addition, the cameras for the studio are out of order. When large scale programs are produced, broadcast vehicles are used. It is difficult to produce more educational programs under this situation.

2) Program sending-out equipment

Most of the facilities at the transmitting studio and the master control room were purchased from 1976 to the beginning of 1980. They are superannuated.

When any of these facilities goes out of order, transmission will immediately be interrupted. Engineers and technicians at the station are checking equipment once a week, when there is no program being broadcast, and try to continue broadcasting without flaws. But spare parts are becoming in short supply, too. As a result, broadcasting is affected once or twice a week on average, because some equipment or other breaks down.

The transmitting studio is not only sending out programs but also transmitting live news. But there are not enough up-to-date facilities to enable production of news programs with special digital effects or superimposition of letters on the screen, to viewers' dissatisfaction.

(3) Appropriateness of the project

Under the above stated conditions, and for the reasons stated below, the project is considered appropriate and necessary.

- 1) By equipping one production studio (with a floor area of about 150 square meters) in the newly constructed studio center with broadcasting equipment and also by providing outdoor coverage equipment, broadcasting time can be expanded by 1.5 hours a day and nine hours a week. This will help achieve the Corporation's goal of expanding air time for educational and informational programs.
- 2) Among the existing facilities, those that are fit for use will continue to be used. But installing new equipment in the transmitting studio and the master control room will enable production of news programs with a variety of techniques. This will also enable increased reliability in transmission of programs over a long period of time.

3-2-2 Relation to Similar Projects and Other Assistance Projects

The General Corporation for Radio and Television has not yet received aid from any other country than Japan to help provide television facilities.

From Japan, it has received or will receive the following in connection with television operations:

(1) ENG equipment and editing equipment

Under cultural grant aid cooperation for fiscal 1990, the following facilities were supplied to Sana'a Station.

- One set of outdoor coverage equipment including two 1/2-inch VTR combined cameras

- One set of A/B role editing equipment comprising three 1/2-inch VTR's.

These items of equipment are used widely at Sana'a Station. They are the station's most up-to-date equipment and are used to edit tapes made outside the station or within the studio.

These facilities will continue to be used to produce programs to be put on-the-air, even after the project has been completed.

(2) Spare parts

Spare parts will be provided for the Corporation under provision of debt relief grant aid cooperation for 1993. They are parts for broadcasting equipment that the Corporation once purchased from Japan.

Most parts for transmitting equipment are products of NEC Corporation and those for studio equipment are made by Sony Corporation. These parts will enable the best possible use of the existing equipment.

The new equipment to be incorporated under the current project, together with existing equipment properly repaired and maintained with these spare parts, will make the entire operation of the TV broadcasting station more effective.

3-2-3 Component Factors of Project

This project is to supply and install necessary equipment in line with its purposes. It consists of the following elements:

- | | |
|---|---------|
| ① Educational program production studio equipment | one set |
| ② Transmitting studio equipment | one set |
| ③ Master control room equipment | one set |
| ④ Outdoor coverage equipment | one set |
| ⑤ Editing equipment | one set |

- ⑥ Measuring equipment and tools one set
- ⑦ Spare parts one lot
- ⑧ Installation materials one lot

These are indispensable components for accomplishing the tasks of a TV studio system from producing television programs to sending them out to transmitters.

In addition to the above-stated equipment, the following existing facilities will continue to be used to produce programs:

- ① Production studio equipment one set
- ② Small studio (transmitting studio) equipment one set

The existing transmitting studio will be used to add an opening and ending portion to pre-recorded programs or to videotape small programs.

- ③ Routing switcher (distribution matrix) one set

This is part of the existing master control room equipment and is used for distributing signals coming from external sources or inside of the existing studio center. The existing routing switcher will also be connected with the new routing switcher in the new master control room.

- ④ Editing equipment six rooms
- ⑤ Outside broadcast vehicle three
- ⑥ ENG equipment 14 units

Figure 3-2-1 shows a conceptual drawing of the total studio system of Sana'a Station after the project has been completed. Figure 3-2-2 shows components of the project and details of the existing equipment.

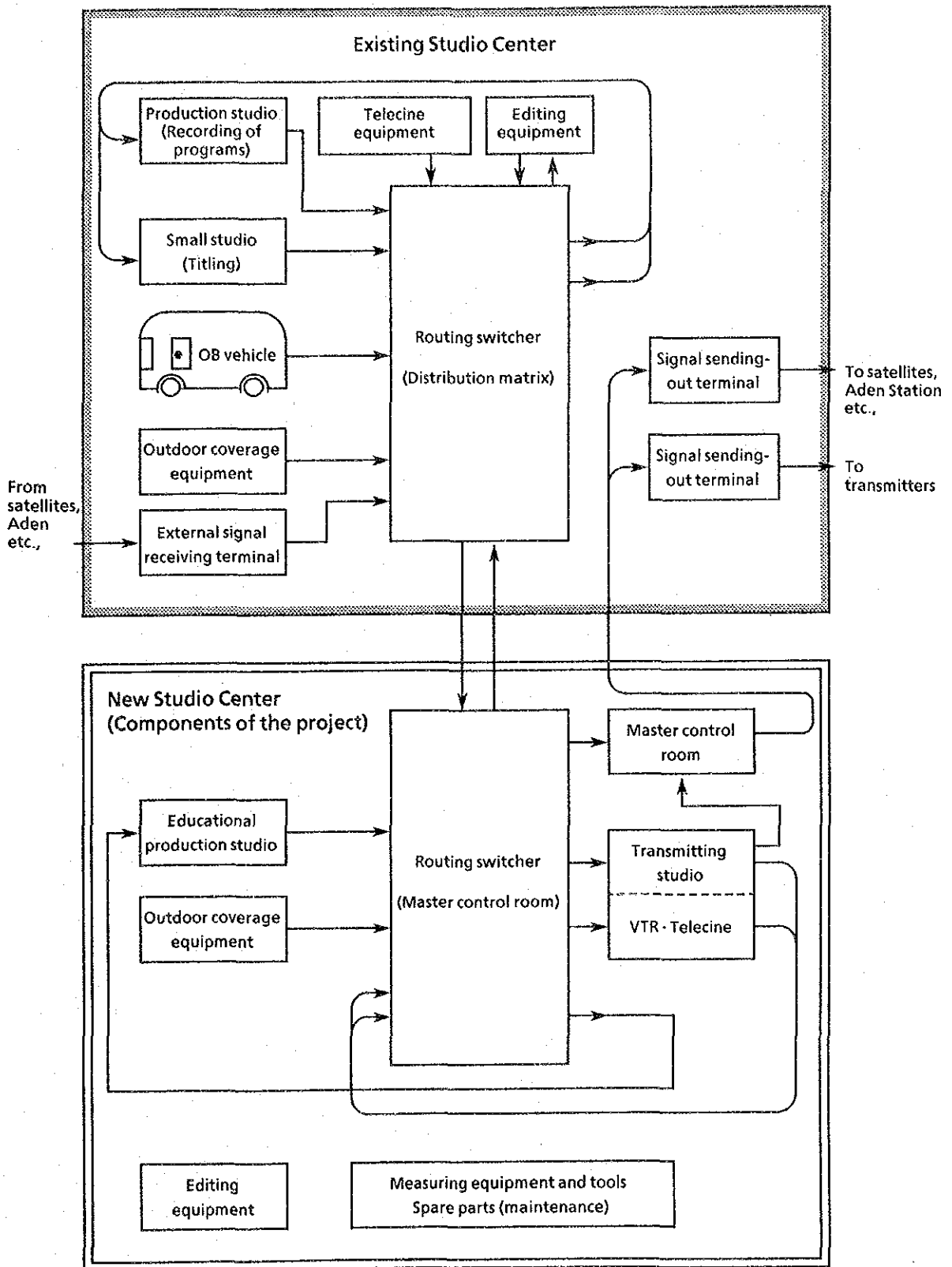


Fig. 3-2-1 Conceptual Drawing of Total Studio System after Completion of the Project

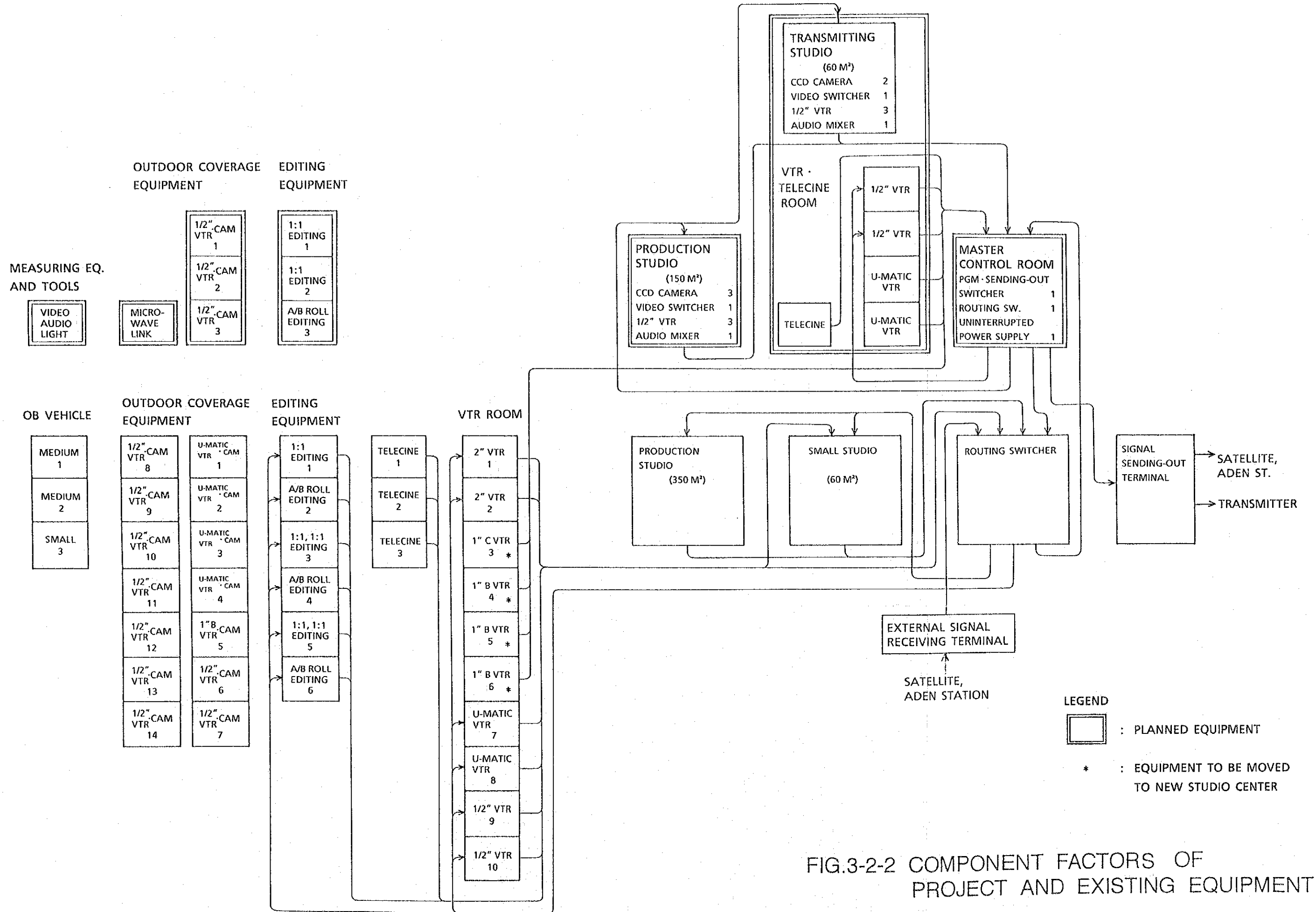


FIG.3-2-2 COMPONENT FACTORS OF PROJECT AND EXISTING EQUIPMENT

3-2-4 Necessity of Technical Cooperation

It is considered that the General Corporation for Radio and Television will be able to operate the equipment without technical cooperation, after the project has been completed.

As will be shown in Section 3-3-5, Operation and Maintenance Plan, the Corporation already has a plan to educate and train personnel through training in and out of the station. In addition, the current staff's capabilities to operate and maintain equipment are at a rather high level, in view of the fact that they are managing to ensure broadcasting and maintaining superannuated equipment that are about 10 years old.

But it will be necessary for Corporation staff to receive explanations from Japanese engineers about how to operate the new devices and how to maintain them. This is because some of the equipment to be provided under the project will be products of new technology and new to the Corporation staff. Such explanations can be given when the equipment is inspected in Japan, or when it is installed or adjusted in Yemen. The Corporation is hoping that Japan will send experts to Yemen and also that Japan will allow some staff members to train in Japan to raise the general technical level of the television station and to improve the quality of programs. Such a request should be considered and implemented under a separate technical cooperation scheme.

3-3 Project Description

3-3-1 Executing Agency and Operational Structure

The organization that will implement the project is the Yemen General Corporation for Radio and Television. But the project is being promoted with the cooperation of the Ministry of Information, the organization in charge of the Corporation. After the project has been completed, the Corporation will continue to be in charge. But the Corporation will do so in cooperation with the Ministry of Information and the Ministry of Education and in close contact with the Council on Program Production, which has been established to improve cultural and informational programs.

The television division (Sana'a Station) of the implementing organization is considered to be capable of serving as the principal implementing party for the project. It has 20 to 30 years of experience in television broadcasting, and wants to increase the number of programs and improve their quality. It has also been maintaining the existing equipment in an excellent way.

3-3-2 Plan of Operation after Completion of the Project

When the project has been completed, there will be an educational program production studio, a transmitting studio to produce and transmit news programs, a master control room, one set of outdoor coverage equipment and one set of editing equipment.

These will enable the production and broadcasting of various programs including those for children and young people, for women at home, for school teachers, programs to promote public morals, traffic safety, hygiene, agriculture, industries, fisheries and programs to introduce various places in the country.

It takes about five times as much time as the actual air time to produce talk shows and other similar programs, and about 20 times as much time as the actual air time to produce dramas, music and other larger programs.

When the project has been completed, the equipment will enable production of 12 thirty-minute programs over a six-day week. Since the project involves production of educational and informational programs, producing one thirty-minute program would take about 3.5 hours.

The equipment will also enable the production of 6 thirty-minute outdoor coverage programs a week using EFP/ENG equipment and the existing transmitting studio equipment.

The project, therefore, will enable the Corporation to achieve its goal of extending broadcasting hours by 1.5 hours a day (additional total of nine hours over a six-day week). Figure 3-3-1 shows the program production schedule using the new production studio and the existing transmitting studio.

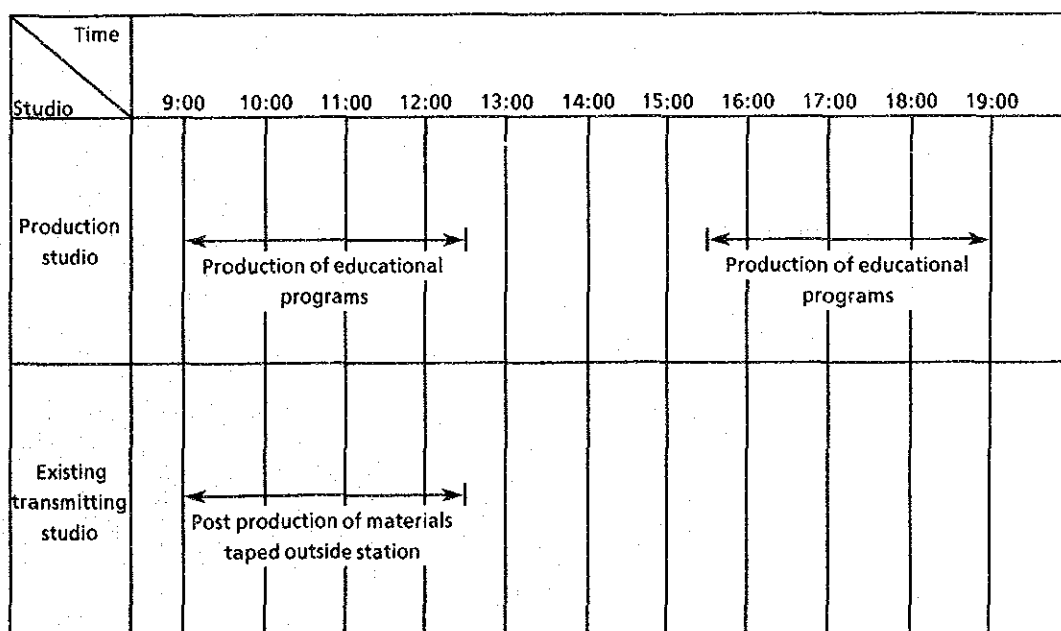


Fig. 3-3-1 Program Production Schedule

After the project has been completed, the broadcasting hours at Sana'a Station will increase from the current 59.5 hours to 68.5 hours a week.

The above-mentioned programs newly produced in the new Sana'a studio center (9-hour weekly total) will be sent in the form of complete tapes or via the microwave network to Aden Station from which these programs will be transmitted through the existing channel 2 transmitting network.

Accordingly, broadcasting hours of Aden Station will also be increased by 9 hours from the present 56 hours per week to 65 hours.

3-3-3 Location and Condition of Project Site

The new studio center is constructed on a small hill (about 60 meters high) to the north of Sana'a City (about 6 kilometers from downtown). It is built on the same premises of Sana'a Station and next to its building.

The Corporation's management and administration division is located about 3 kilometers south of Sana'a Station toward downtown.

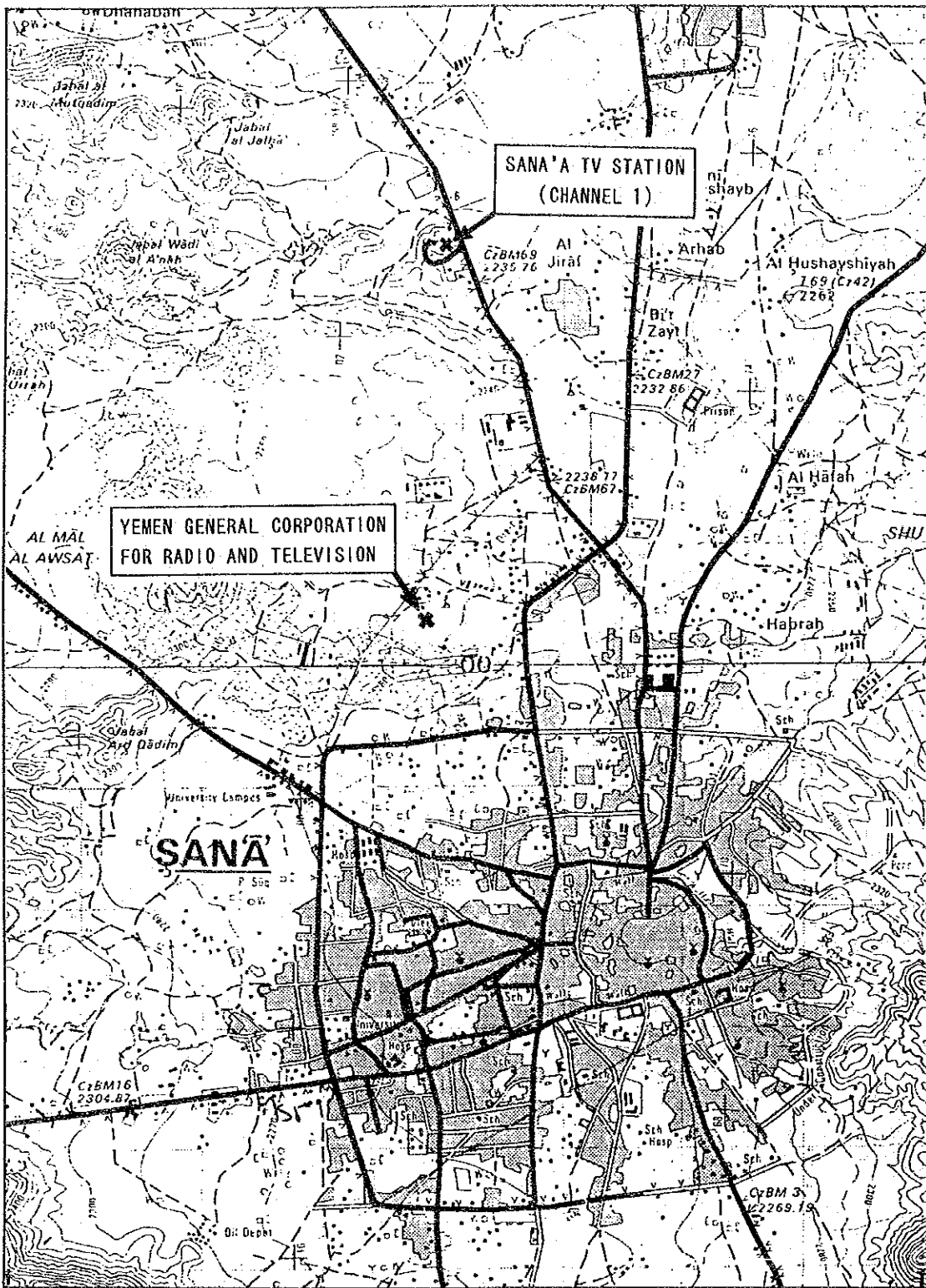
Figure 3-3-2 shows the location of the Corporation and Sana'a Station. Figure 3-3-3 shows the site layout of Sana'a Station.

Photograph 3-3-1 shows a distant view of Sana'a Television Station on the hill.

The new studio center has a floor area of about 6,000 square meters. It is a stylish building with outside decoration of stone, typical of buildings in Yemen. Part of the front is three-storied, but, otherwise, it is a two-storied building. Inside are one production studio, one transmitting studio, one main control room, one spacious spare parts storage area, one tape storage room, etc. There is also considerable space for offices.

The construction work on the new studio center is almost complete. Partitions are to be installed in some of the rooms and so are studio lighting grids. Some of the air conditioning facilities are still to be completed. Power receiving facilities are not yet installed.

Photograph 3-3-2 shows the outside appearance of the new studio center.



0 1km
Scale: 1/50,000

Fig. 3-3-2 Location of General Corporation and Sana'a TV Station

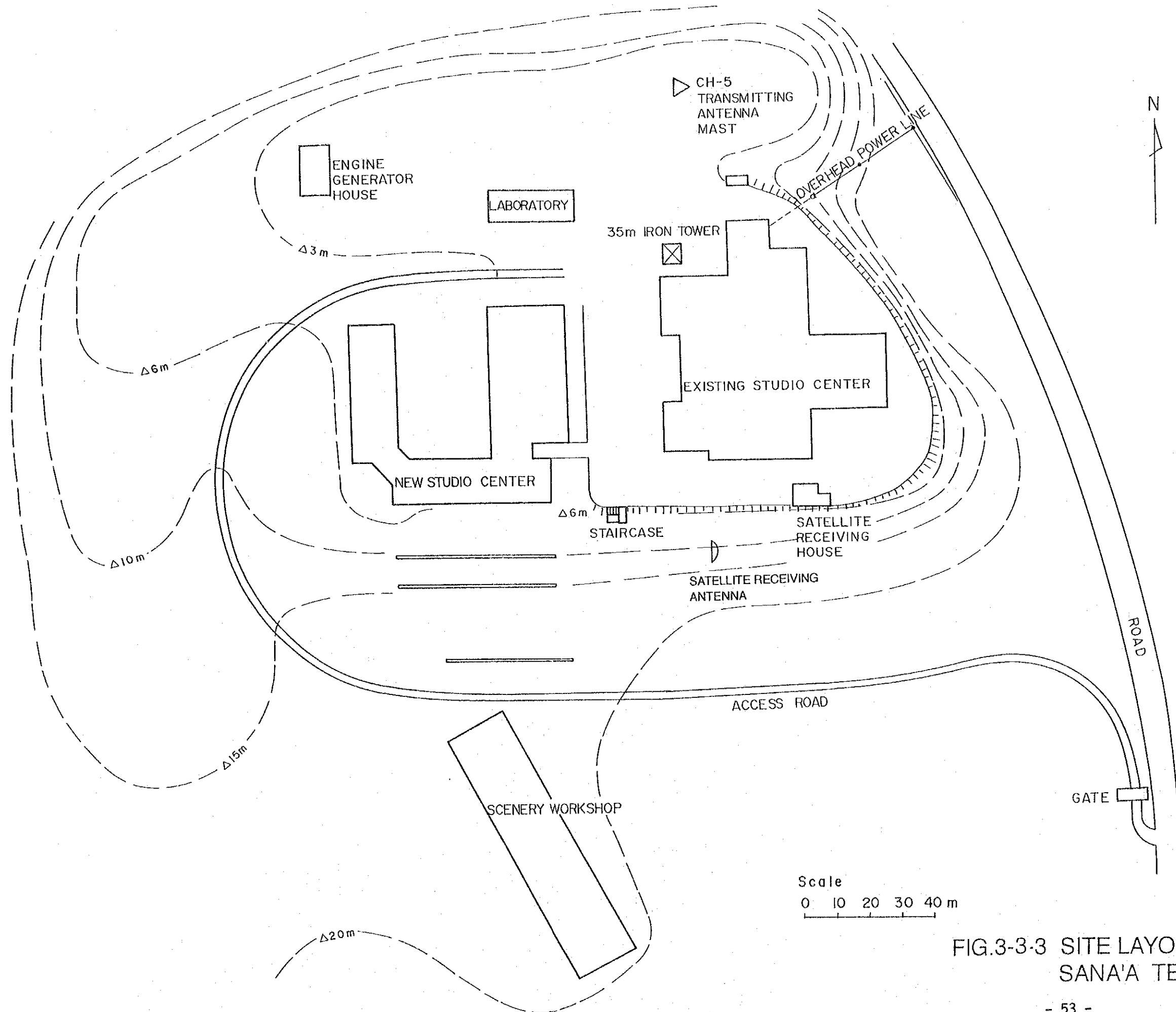


FIG.3-3-3 SITE LAYOUT OF SANA'A TELEVISION STATION

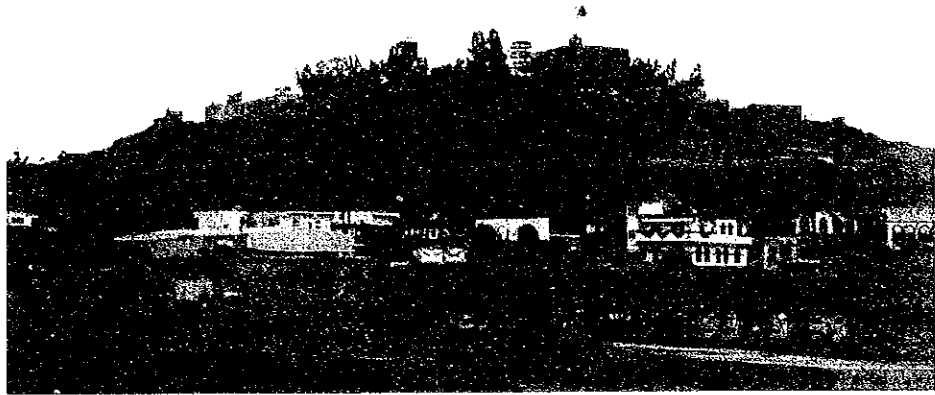


Photo. 3-3-1 Distant View of Sana'a TV Station

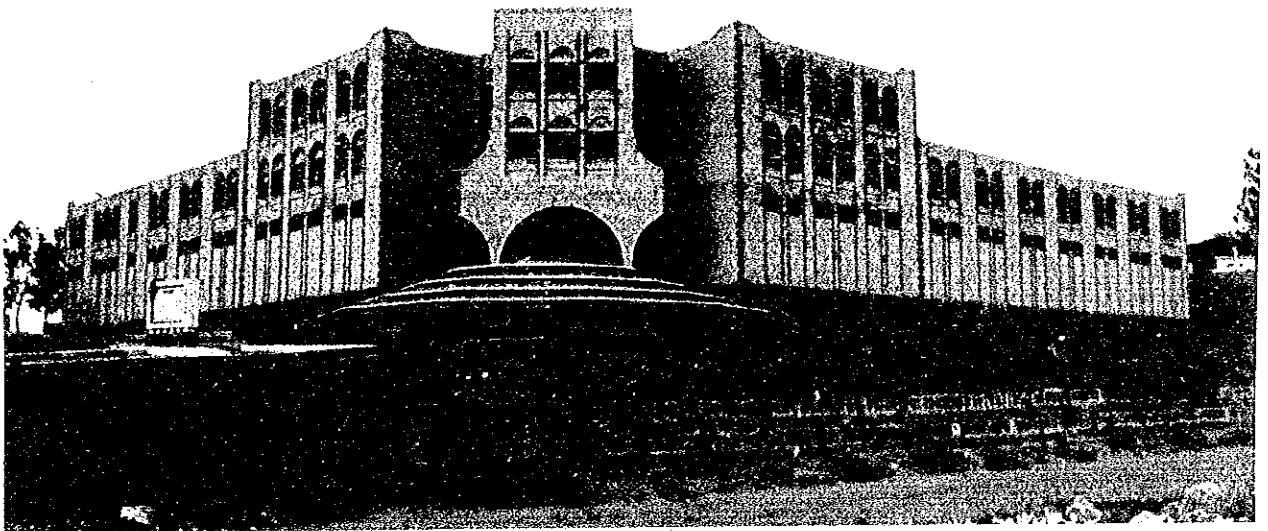


Photo. 3-3-2 New Studio Center

3-3-4 Outline of Equipment

Table 3-3-1 shows a list of major equipment and brief descriptions.

Table 3-3-1 Description of major equipment

Names of facilities	Main equipment	Functions
<p>1. Educational program production studio equipment one set</p>	<ul style="list-style-type: none"> • CCD camera • Video switcher • 1/2-inch VTR • Character generator • Frame synchronizer • Slide scanner • Sync signal generator • Audio mixer • Audio tape recorder • Cassette tape recorder • CD player • Telephone sound pickup device • Microphone and stand • Production intercom • Video and audio monitors • Studio lighting 	<p>Facilities to produce dialogues, lectures, science experiments, and other educational and informational programs, skits, music programs, viewer participation programs, etc.</p> <p>Three CCD cameras will be installed. Life of CCD is almost unlimited. They are easy to handle. Video signals by cameras or VTR's will be chosen and mixed by a video switcher, to make a program. Such a program will either be broadcast live or recorded by VTR. The character generator will be used to make titles and other letters on the screen. The audio mixer will be used to adjust volume from many microphones and tape recorders to produce sound for programs.</p>
<p>2. Transmitting studio equipment one set</p>	<ul style="list-style-type: none"> • CCD camera • Teleprompter • Video switcher • 1/2-inch VTR • Character generator • Frame synchronizer 	<p>These are the facilities to produce and send out news programs, and to sent out other programs from VTR's, telecine, etc., according to a daily air timetable.</p>

Names of facilities	Main equipment	Functions
<p>3. Master control room equipment one set</p>	<ul style="list-style-type: none"> ● Slide scanner ● Station logo generator ● Time generator ● Sync signal generator ● Audio mixer ● Audio tape recorder ● Cassette tape recorder ● CD player ● Telephone sound pickup device ● Microphone and stand ● Production intercom ● Video and audio monitors ● Studio lighting (VTR · Telecine room) ● VTR ● Telecine device ● Routing switcher ● Program sending-out switcher ● System converter ● Slide scanner ● VTR ● Sync signal generator ● Cassette tape recorder 	<p>Also, they are used to broadcast short announcements between programs. There will be two CCD cameras and teleprompters for newscasters to read news while looking at cameras. The station name and time will be inserted from time to time onto programs. The video switcher and the audio mixer in this studio are a little smaller in scale than those in the production studio, but they have similar functions.</p> <p>The telecine equipment allows transmitting 16mm and 35mm films such as news, documentaries, etc.</p> <p>To distribute signals coming in from outside (Aden Station, OB vehicles, satellites, etc.), those produced in the studios, from telecine and VTR's to necessary places.</p> <p>To make final choice of programs to be sent out to transmitting stations.</p>

Names of facilities	Main equipment	Functions
	<ul style="list-style-type: none"> • Video and audio monitors • Communication interphone • Clock equipment • Uninterrupted power supply equipment 	<p>To generate standard synchronous signals to obtain synchronization of video signals within the station.</p> <p>To carry out emergency broadcasting using a VTR and slides.</p> <p>To monitor quality of signals.</p> <p>The equipment in the room are designed to get power from the uninterrupted power supply system to continue broadcasting at the time of a power failure.</p>
<p>4. Outdoor coverage equipment one set</p>	<ul style="list-style-type: none"> • VTR combined camera and accessories • Portable audio equipment • Monitoring equipment • Lighting equipment • 7GHz microwave link 	<p>Portable equipment to videotape program materials outside the station, or to broadcast live.</p> <p>VTR combined cameras allow ease of mobility on the spot.</p>
<p>5. Editing equipment one set</p> <p>(1) 1:1 editing equipment two units</p> <p>(2) A/B roll editing equipment one unit</p>	<ul style="list-style-type: none"> • 1/2-inch VTR and monitor • 1/2-inch VTR and monitor • Editor • Video switcher • Audio switcher 	<p>One VTR replays video and the other VTR records while editing videos.</p> <p>Two VTR's replay program materials and while editing and mixing them, another VTR records. More advanced than the editing equipment (1) above.</p>

Names of facilities	Main equipment	Functions
6. Measuring equipment and tools one set	<ul style="list-style-type: none"> • TV test signal generator • Audio measuring equipment • Oscilloscope • Waveform monitor • Vectorscope • Illumination meter • Color meter • Circuit tester • Set of tools • Standard tapes 	<p>The measuring equipment is used for periodical inspection of facilities. It is also used to readjust, or repair, when necessary, keeping facilities in good working condition.</p>
7. Spare parts one lot	<p>Details of contents will be decided when detailed design is conducted.</p>	<p>There will be enough spare parts so that no additional supplies (except consumables) will be required for at least two years after operation has started.</p>
8. Installation materials one lot	<ul style="list-style-type: none"> • Video cable • Audio cable • Control cable • Power cable • Various kinds of connectors • Other sundry materials 	<p>Cables and other materials needed in installing all the equipment and devices.</p>

3-3-5 Operation and Maintenance Plan

(1) Personnel Plan

In operating the project, at least the following number of personnel is required as indicated in Table 3-3-2:

Table 3-3-2 Additional Personnel Required

Personnel \ Facilities	Production studio	Transmitting studio	Master control room	Outdoor equipment coverage	Editing equipment	Total
Program director	2x2	1				5
Technical director (TD)	1x2	1	1x2			5
Video Engineer (VE)	1x2					2
Cameraman	3x2	2				8
Video switcher man	1x2	1				3
Lighting director (double duties of TD)						-
Lighting technicians	1x2			2		4
Audio mixer man	1x2			1		3
Microphone operator	1x2					2
Outdoor coverage crew				3		3
Editing crew					3	3
Personnel required	11x2 (2 shifts)	5	1x2 (2 shifts)	6	3	38

When the project is finished, 38 personnel will be needed. But considering holidays and taking of leaves, a total of 49 will be required. This number is obtained by multiplying the 38 personnel by 1.29*note 1).

*note 1)

$$\frac{365 \text{ days}}{365 \text{ days} - 52 \text{ days (Fridays)} - 15 \text{ days (leaves with pay)} - 15 \text{ days (holidays)}} = 1.29$$

When the Corporation hires people to fill these new positions, it will announce the number of people to be employed, their required qualifications, etc., over radio and television.

Applicants will be screened by written tests and interviews. Those who pass are to undergo the following three-stage training.

First stage: Visiting and observing work sites (one month)

To visit various work sites in the station and get a general idea of activities and work duties

Second stage: Training at work sites (two months)

To get training on the work sites to which new employees will be assigned

Third stage: Lectures (2 or 3 months)

To receive lectures from experts in specialized fields in the broadcasting stations at the Corporation's training center

When the terms of training are over, the Corporation may release any new employees who are thought to have no aptitude for their positions.

After they are assigned to their positions, they will receive on the job training.

The Corporation is currently sending its staff overseas, whenever appropriate and possible, to acquaint them with higher levels of knowledge and skills.

Four to five engineers or program directors are sent every year to the Arabic Broadcast Union (ASBU) in Damascus, Syria. They receive three to four weeks of training.

Many people have also been sent to receive training in other Arab nations such as Egypt and Qatar, as well as to Britain, France, and the former Soviet Union.

Japan has hosted two studio engineers and nine transmitting engineers from the Sana'a Station either through public organizations or the private sector.

(2) Maintenance System

The maintenance of new equipment will be based upon the current maintenance system. Technical capabilities of the current maintenance staff that are maintaining, inspecting and repairing the existing facilities are rather high. It will suffice if Japanese staff explain how to inspect and maintain new equipment and devices when they are installed.

(3) Budget Plan

The following is an estimated increase of annual spending, including the cost for additional personnel, after the project has been completed:

Personnel expenses (49 new employees)	YR	7,056,000.-
Electricity charges	YR	901,000.-
Water charges	YR	72,000.-
Video tapes	YR	627,000.-
Light bulbs for studio lighting	YR	270,000.-
Maintenance and repair	YR	3,400,000.-
<hr/>		
Total	YR	12,326,000.-

This would be an increase of about three percent over the budget of the Corporation for 1993 (393.4 million rials).

The Corporation's finances are in a difficult situation. They were in the red in 1991 and 1992. They are also expected to be in the red in 1993. But the Ministry of Information considers this improvement plan as a priority project for the country and will secure operational and management funds.

A breakdown of each cost item is shown below.

1) Personnel expenses

Monthly personnel expenses per new employee:

Estimated at 12,000 rials/month

Total personnel expenses of new employees (49 people):

7,056,000 rials/month (=12,000rials×12months×49)

2) Calculation of electricity charges

a) New studio center

Consumption : Estimated at 2,200 kWh/day

Rate : 1 rial/kWh

Monthly charges : 66,000 rials (=2,200kWh×30days×1rial)

Annual charges : 792,000 rials (=66,000rials×12months)

b) Transmitting network

The transmitting network of Sana'a Station (Channel 1) consists of 28 transmitting stations and transposer stations. The transmitting network of Aden Station (Channel 2) consists of 9 transmitting stations and 37 transposer stations.

The following is an estimate of electricity charges that would arise from operating all these transmitting stations and transposer stations for 1.5 hours a day and 26 days a month (9-hour weekly increase excluding Friday).

Consumption : Estimated at 350 kWh/day

Rate : 1 rial/kWh

Monthly charges : 9,100 rials (=350kWh×26days×1rial)

Annual charges : 109,200 rials (=9,100rials×12months)

The estimated total of electricity charges would be 901,200 rials (about 901,000 rials).

3) Calculation of water charges

Consumption : Estimated at 20m³/day
Rate : 10 rials/m³
Monthly charges : 6,000 rials (=20m³×30days×10rials)
Annual charges : 72,000 rials (=6,000rials×12months)

4) Calculation of expenses for purchasing video tapes

a) Tapes for studio production

In all, 18 programs are broadcast a week (three 30-minute programs × 6 days). Assuming that three times as many video tapes are needed to produce those programs, 54 video tapes will be needed each week.

Video tapes are used repeatedly. For each program they are recorded, edited and broadcast and preserved for a short period of time. If this cycle is repeated every four weeks, video tapes will exhaust their service life after one year of use and will then be discarded.

This means that the number of video tapes needed each year would be 216 (54 × 4 weeks). But considering that some tapes will be preserved for a longer period of time and that there should also be some spare video tapes, about 400 video tapes will be needed each year.

The number of video tapes needed yearly : Estimated at
400 rolls
Price for one 30-minute tape : 930 rials
Annual cost for the purchase of video tapes
: 372,000 rials
(=400rolls
×930rials)

b) Tapes for outdoor coverage

Assuming that each of the three ENG systems will be operated for one hour a day and that the systems will be repeatedly used for a cycle of two weeks, the following equation is obtained:

$$3\text{rolls/day/one system} \times 3\text{ENG} \times 7\text{days} \times 2\text{weeks} = 126\text{rolls}$$

Since video tapes for ENG systems should be supplied twice a year, the number of tapes to be needed each year will be as follows:

$$126\text{rolls} \times 2\text{times} = 252\text{rolls}$$

Generally speaking, programs to be taped by ENG systems tend to be the ones preserved for longer periods of time. When this is taken into consideration, about 300 rolls in all would be necessary for a year.

The number of ENG tapes needed each year : Estimated at

300 rolls

Price per one 20-minute tape : 850 rials

Annual cost for the purchase of ENG video tapes

: 255,000 rials

(=300rolls

x850rials)

In all, the annual cost of purchasing video tapes is estimated at 627,000 rials.

5) Calculation of expenses for light bulbs for studio lighting

a) Production studio

Operation hours : Estimated at 2,496 hours
(= 8hours × 6days × 52weeks)

Average electric power needed for lighting

: Estimated at 75kW

Annual consumption : 187,200kWh
(= 75kW × 2,496hours)

Average life of bulb : Estimated at 300 hours

Price for one 1kW bulb : 320 rials

Annual cost for bulbs : 199,680 rials
(= 187,200kWh ÷ 300hours × 320rials)

b) Transmitting studio

Operation hours : Estimated at 3,276 hours
(= 9hours × 7days × 52weeks)

Average electric power needed for lighting

: Estimated at 20kW

Annual consumption of electricity for lighting
: 65,520kWh
(= 20kW × 3,276hours)

Average life of bulb : Estimated at 300 hours

Price for one 1kW bulb : 320 rials

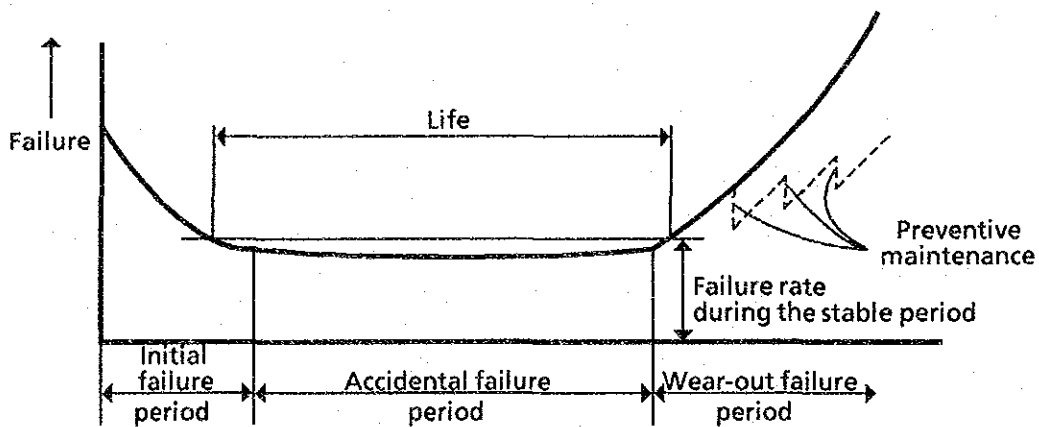
Annual cost for bulbs : 69,888 rials
(= 65,520kWh ÷ 300hours × 320rials)

From the above, the cost of purchasing light bulbs for lighting is estimated at 269,568 rials (about 270,000 rials).

6) Maintenance and management expenses

All the items of equipment to be provided under this project will be those using semiconductors and, therefore, unlike vacuum tube types, they have no element requiring periodical replacement. However, in the case of video tape recorders and audio tape recorders, there is the need for periodical changing of their heads as the heads become worn out. Also indispensable are the supplies of such consumables as fuses and lamps.

Generally speaking, failures of broadcasting equipment occur at the following rate with the passage of time:



① Initial failure period

The failures occurring during this period are initial failures caused by shortcomings in designing or manufacture. So, during this period, it is important to ensure the speedy exchange of information between the user and the supplier so that necessary measures may be taken quickly to detect the cause of the failure.

② Accidental failure period

After improvements are made during the above-mentioned initial failure period, the failure rate thereafter will be kept at a certain low level. The service life of a unit of equipment is the period when the failure rate is maintained below the prescribed level, prior to entering the next period, that is, the wear-out failure period.

③ Wear-out failure period

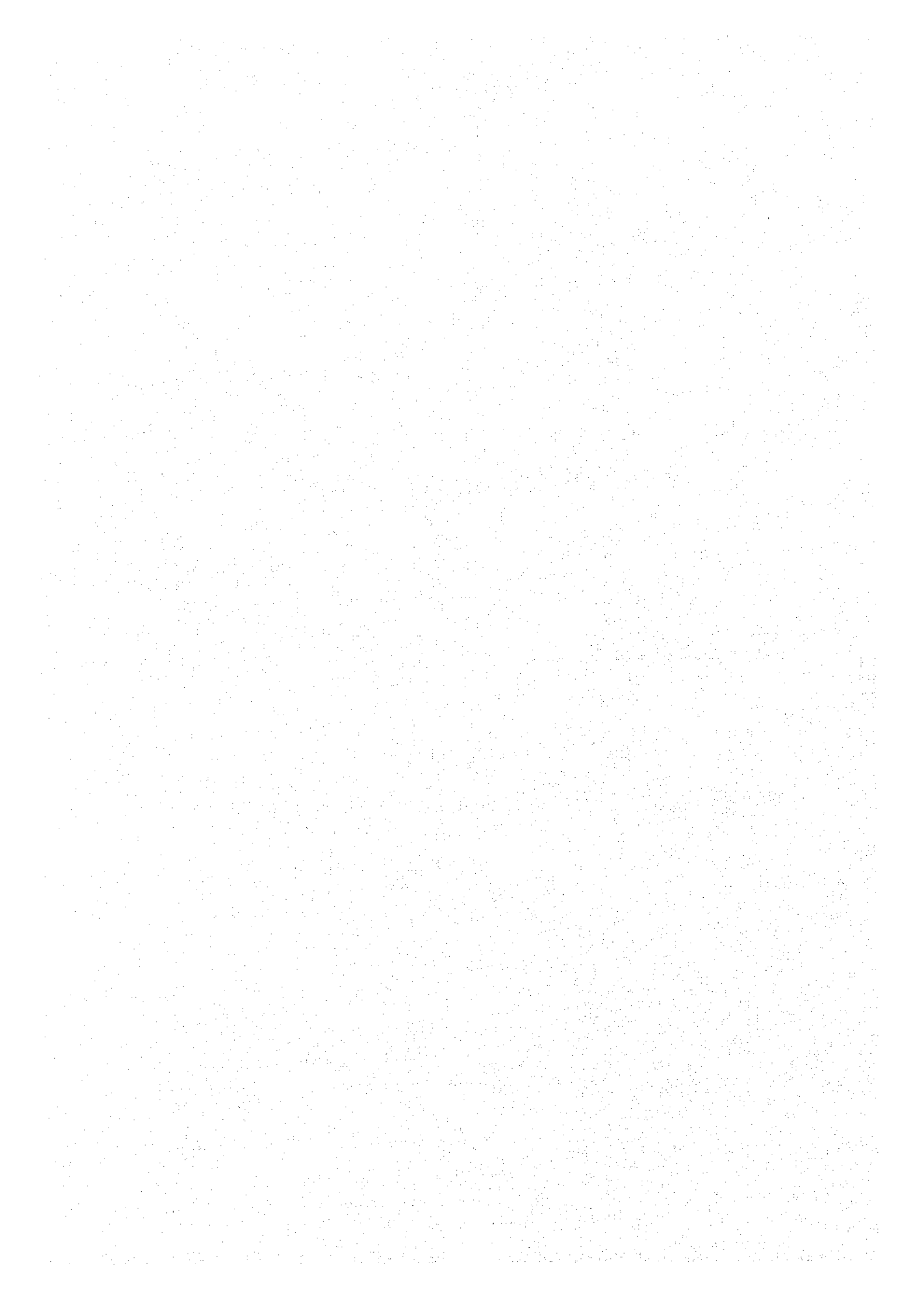
After the accidental failure period in the service life of the parts, unit devices or systems is over, the failure rate will again go up.

The failures occurring during this period are caused by the wear and deterioration of the parts constituting the device or the system. By taking appropriate preventive maintenance measures, it is possible to reduce failures and thereby extend, to some degree, the life of the device or the system.

The failures during the accidental failure period, which constitutes the greater part of the service life of a device or a system being used, occur at any time at random. The failure rate is constant in terms of duration and is relatively low. Yet, the conditions of the failures are extremely wide-ranging. These failures are heavily affected by stresses from such environmental conditions as the conditions of use, temperature and humidity. Most devices and systems can be used in fairly good condition for ten years on average, if they are periodically maintained.

Based upon past experiences in Japan, about 3,400,000 rials will be needed yearly as the maintenance and management cost, in view of the amount of the equipment.

Chapter 4 Basic Design



Chapter 4 Basic Design

4-1 Design Policy

The following are design policies spelled out for the project. In compiling the policy, consideration was given to the current operational situation at Sana'a Television Station and its future plans. Also, the highest priority was placed on ease of operation and maintenance, economy and adequate scale to eliminate waste.

- Equipment should be in line with the goals of the project and should be limited to what are basic and necessary. They should also be in line with operating environments and systems in Yemen.
- Of the existing facilities, as many as possible that are fit for use should be incorporated into the new system. This is to increase the efficiency of the system as a whole.
- In choosing types of equipment and their specifications, emphasis should be placed on whether they are easy to maintain and manage, whether their structures are simple and durable, and whether it is easy to obtain spare parts or supplies.
- The specifications should follow the CCIR. They should follow, in other words, most common standards now in use at broadcasting stations. The equipment should also be electrically and mechanically safe and solid.
- The equipment making up the new system should be as uniform as possible. This will make operation and maintenance easier and help reduce maintenance and management costs.

Based upon the above-stated policy, the following new equipment is to be introduced.

(1) 1/2-inch tape VTR

VTR's using 2-, 1-, 3/4- and 1/2-inch tapes are currently used at Sana'a Station.

The project calls for the introduction of 1/2-inch type VTR's for broadcasting use. This is in line with a recent technological trend. This type of VTR is smaller and lighter than other conventional ones, and has better picture quality. It is also superior in maneuverability. 1/2-inch VTR's use metal tapes and this has improved their performance a great deal. They show no signs of deterioration after several rounds of editing. They are being utilized in the mainstream of broadcasting stations around the world.

The system for sending-out programs, however, will be designed in such a way that will allow use of different types of VTR's other than 1/2-inch. This is because there is software stored in 3/4 inch U-matic tapes and 1-inch tapes, and this should also be able to be reproduced and sent out on a new system. But no 1-inch VTR's will be newly provided. The existing ones will be moved to the new studio center and will continue to be used. This is because their use is expected to gradually decrease.

The 1/2-inch VTR's that are being discussed here have specifications for broadcast use only. They are quite different from 1/2-inch VTR's for home use which are either on VHS or Beta systems. There is no compatibility of tapes, either.

(2) CCD camera

Charge coupled device (CCD) makes use of a kind of solid image elements. CCD has been undergoing rapid improvement recently. CCD cameras are replacing conventional tube cameras. They have many merits: They can provide for better picture quality. They are smaller and lighter. They are solid and easier to handle, and their life is longer and maintenance easier.

All cameras to be provided under this project are CCD cameras.

4-2 Study and Examination of Design Criteria

The following conditions are set when designing equipment:

(1) Educational program production studio equipment

Programs to be produced in the production studio include dialogues, panel discussions, commentaries, lectures and other programs where the focus is on people as they speak. There will also be programs on cooking, handicrafts, school science experiments and others. All these require close-ups of people or performers' hands as well as long shots.

The studio is also capable of producing smaller-scale musical events such as performances of folk music, performing arts and dancing, as well as viewer-participation programs such as a quiz programs in which children take part. Dramas and skits will also be produced. Equipment to be installed in the studio should be able to cope with these requirements.

- Enough cameras to make possible all types of angles from close-ups to long shots whenever and wherever needed.
- Video switcher, special effects and lighting devices to make possible expressions as planned by program directors.
- Function capable of gathering sound in the studio and varied ways of mixing sound.
- Function capable of inserting and recording video and audio signals.
- Function to synchronize signals from outside such as satellites, OB vehicles, Aden Station, etc., with those inside the station.
- Intercommunication function to allow production staff to communicate with each other while a program is being made.
- Function to monitor contents and flows of programs and objects, as well as to monitor picture and sound quality.

(2) Transmitting studio equipment

The transmitting studio sends out programs according to the airing timetable. It is also used to produce news programs and announcements to be broadcast between programs. The requirements for this studio are as follows:

- Cameras enough to shoot newscasters or announcers in the studio, as well as charts and graphics in the studio.
- Video switcher and special effects that will enable full range of effects for news programs.
- Video switcher and special effects to make possible live announcements and production of short programs to be shown among broadcast programs.
- Function capable of picking up sound clearly and well and mixing sound.
- Function capable of inserting and recording video and audio signals.
- Function to synchronize signals from outside such as satellites, OB vehicles, Aden Station, etc., with those inside the station.
- Intercommunications function to allow production staff to communicate with each other while a program is being produced or sent out.
- Function capable of conducting live broadcasting and reproducing films or video tapes at any moment.
- Function to bypass circuits in the event of system trouble.
- Function to send out test signals, station identification, and other necessary signals for broadcasting.
- Function to monitor contents and flows of programs and objects as well as to monitor picture and sound quality.

(3) Master control room equipment

- Function to distribute signals from inside and outside of the station to necessary destinations inside and outside of the station.
- Capability of making final choice of programs to be sent out to transmitting stations.
- Capable of broadcasting by playback of video tapes and of broadcasting of an emergency announcement by slides and audio cassette tapes.
- To generate standards of synchronizing signals in the new studio center.
- Capable of converting color television systems.
- To be the source of standard time for all the clocks within the studio.
- Capable of monitoring quality of video and audio signals.

(4) Outdoor coverage equipment

- Having uniform structure with camera and VTR combined. To be small and light.
- Capable of producing similar picture quality that is comparable with those taken in studios.
- Both for hand carrying and for use with tripods.
- Capable of collecting clear sound outside or effect sounds, and capable of mixing sound.
- Capable of allowing production staff to immediately watch and listen to what has been videotaped.
- Lighting capabilities.
- Function to send programs from a location to the studio center.

(5) Editing equipment

1) 1:1 editing equipment

- Capable of simple editing by taking out necessary cuts from one tape and editing them to be recorded on the other VTR.
- Capable of slow-motion editing.

2) A/B role editing equipment

- Capable of switching necessary cuts from two tapes and editing them as those cuts are composed into another tape. When switching videos, simple special effects can be inserted.
- Capable of slow-motion editing.

(6) Measuring equipment and tools

- Capable of measuring performances of video signals.
- Capable of measuring performances of audio signals.
- Capable of measuring illumination.
- Provision for tools necessary for daily maintenance of equipment.

4-3 Basic Plan

4-3-1 Layout Plan

The equipment supplied under the project will be laid out and installed in the new studio center built by the Yemeni side.

(1) Production studio

The production studio is located in the eastern side of the new studio center. Its floor area is about 150m².

The control room and the studio floor are on the second floor. Control of video, audio and lighting is conducted in one control room. Next to the control room is a dimmer rack room for studio lighting.

(2) Transmitting studio

The transmitting studio is at the northern side of the building next to the control room mentioned above. The studio (about 60m² in floor space), the control room, a VTR-telecine room and an editing room constitute one big function area.

(3) Master control room

The master control room is across the corridor facing the transmitting studio.

(4) Outdoor coverage equipment room

The equipment will be placed in a room near to the maintenance room on the eastern side of the new studio center.

(5) Editing rooms

There are three editing rooms. One editing room is located at a corner of the VTR-telecine room, another is on the southern side of the master control room and the other is across the corridor facing the outdoor coverage equipment room.