MINISTRY OF INFORMATION
THE REPUBLIC OF YEMEN

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR UPGRADING OF BROADCASTING EQUIPMENT IN ADEN STATION IN THE REPUBLIC OF YEMEN

JANUARY 1998

Japan International Cooperation Agency
NHK Integrated Technology Inc.

MINISTRY OF INFORMATION
THE REPUBLIC OF YEMEN

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR UPGRADING OF BROADCASTING EQUIPMENT IN ADEN STATION
IN
THE REPUBLIC OF YEMEN

JANUARY 1998

Japan International Cooperation Agency
NHK Integrated Technology Inc.

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 Upgrading of Broadcasting Equipment in Aden Station in the Republic of Yemen and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Yemen a study team from July 13 to July 30, 1997.

The team held discussions with the officials concerned of the Government 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 basic design, and as this result, 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.

January 1998

Kimio Fujita
President
Japan International Cooperation Agency

Letter of Transmittal

January 1998

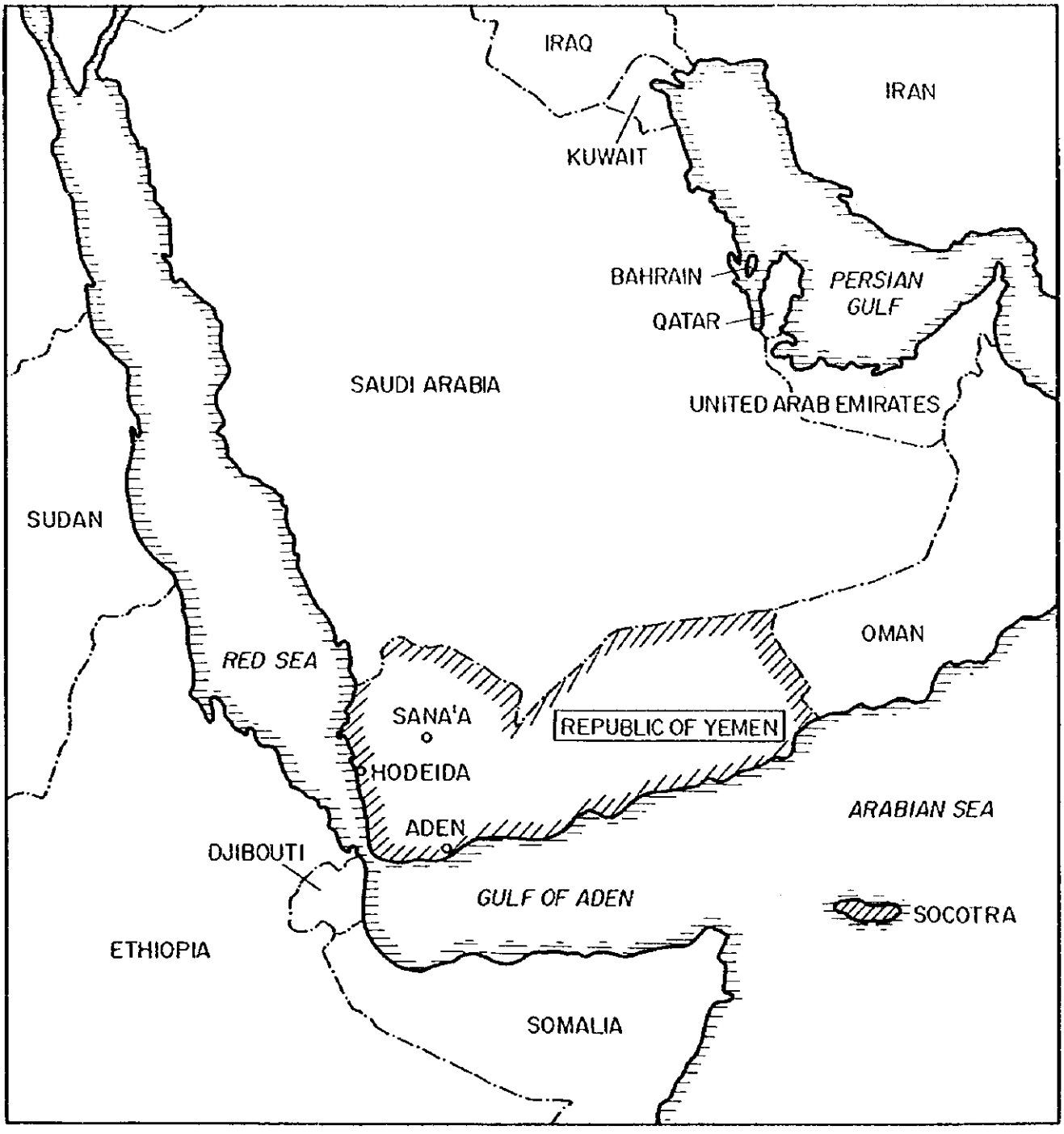
We are pleased to submit to you the basic design study report on the Project for Upgrading of Broadcasting Equipment in Aden Station in the Republic of Yemen.

This study was conducted by NHK Integrated Technology Inc., under a contract to JICA, during the period from July 1, 1997 to January 16, 1998. 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.

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

Very truly yours,

Susumu Toyoda
Project manager,
Basic design study team
on the Project for Upgrading
of Broadcasting Equipment
in Aden Station
NHK Integrated Technology Inc.



THE REPUBLIC OF YEMEN

Abbreviation

AIR	On-air monitor
AVR	Automatic voltage regulator
B/W	Black and white monitor
CA	Camera
CCU	Camera control unit
CG	Character generator
CM	Color monitor
DVE	Digital video effect equipment
E/G	Engine generator
EXT	External signal
FS	Frame synchronizer
M/E	Video mix & effect
MM	Color master monitor
PV MON	Preview monitor
SG	Sync. signal generator
TSC	Television system converter
VDA	Video distribution amplifier
VE MON	WFM, VSC, MM or WFM, VSC (OB Van)
VITS	Vertical interval test signal
VSC	Vector scope
V SWT	Video switcher
VTR	Video tape recorder
WFM	Waveform monitor
A MIX	Audio mixer
ADA	Audio distribution amplifier
CTR	Compact cassette tape recorder/reproducer
CD	Compact disc player
EFF	Audio effect equipment
LIM	Limiting amplifier
ORT	Open reel tape recorder/reproducer
VU	VU meter
ITU-R	International Telecommunication Union - Radio Communication Sector

Contents

Page

Chapter 1.

Background of the Project

Chapter 1. Background of the Request

1-1 Current Conditions and Problems in the Television Broadcasting Sector

Following the unification of Southern Yemen and Northern Yemen in 1990, television broadcasting in Yemen commenced as a dual station setup with the unification of the Aden Station in the south and the Sana'a Station in the north under the General Corporation for Radio and Television of Yemen. The Sana'a Station was opened in 1975 as the broadcasting station for the former Northern Yemen (the Yemen Arab Republic), and the Aden Station was opened in 1964 as the broadcasting station for the former Southern Yemen (the Yemen Democratic People's) and each station carried out television broadcasting over the whole of each of these former states prior to their unification.

Following unification, the Sana'a Station was given responsibility for Channel 1 broadcasts and the Aden Station was given responsibility for Channel 2 broadcasts. However, because the coverage of both channels was divided between the north and the south of the country in line with the pre-unification setup and broadcasting was thus unable to contribute to the development of national consciousness in line with the spirit of unification, the Government of Yemen set about expanding the coverage of both stations. As a result, Channel 1 broadcasts can now be received by approximately 86% of the national population except for in eastern desert areas that used to belong to the former Southern Yemen. However, as for Channel 2 broadcasts, coverage which centers around southern areas not covered by Channel 1 is gradually being expanded to areas of the former Northern Yemen, but the ratio of the population able to receive such broadcasts is still less than 60%.

The Government of Yemen also constructed a new broadcasting center building for the Sana'a Station through its own funds with a view to raising broadcasting capacity, and in fiscal 1995, the Government of Japan provided program production equipment to the Sana'a Station through grant aid in order to ensure the effective functioning of the said broadcasting center. As a result of this, Channel 1 broadcasting time was roughly doubled and program contents improved by 1997.

However, at the Aden Station, originally constructed as the broadcasting center of the former Southern Yemen, deterioration of broadcasting facilities is conspicuous and the station is struggling to even maintain its current broadcasting times. Moreover, because of the

increasing differential with the Sana'a Station which possesses new facilities, there is no compatibility in terms of equipment and it is not possible to build a complimentary setup with the Sana'a Station nor establish an efficient broadcasting system.

1-2 Background of the Project

(1) Background

In Yemen, the literacy rate and school attendance rate among general citizens are both low at 41.1% and 44% respectively, and much of the population live in small villages scattered throughout the country. For these reasons, various problems exist such as the insufficient transmission and low quality of general cultural and lifestyle-related information, and so on. Within these conditions, it is estimated that some 2,200,000 television sets are owned in Yemen and citizens are obtaining information necessary to their daily lives via television broadcasts. For this reason, as can be seen in the national development plan, the Government of Yemen is striving to make effective use of television broadcasting in order to transmit information and promote cultural and education activities as a prerequisite for economic and social development.

Of the two stations that carry out television broadcasting in Yemen, the Sana'a Station has been provided with broadcasting equipment through grant aid from Japan, the result of which has been a strengthening of the station's functions. In contrast, much of the broadcasting equipment at the Aden Station, which was the broadcasting center for the former Southern Yemen, has been in use for 15 years or more and breakdowns, deterioration and obsolescence have reached serious levels. As a result, the best the station can do is maintain its current broadcasting time (67 hours per week), and it is unable to bolster and enhance information transmission and programs above current levels. Moreover, because broadcasting equipment at the Aden Station is not compatible with the new equipment possessed by the Sana'a Station, the two stations are unable to exchange program resources and other obstructions to everyday operation are arising.

The Government of Yemen, despite striving as much as possible to renew equipment and facilities at the Aden Station, is not in a position to expand the functions of the station through equipment installation due to a lack of available funds, and it is against this background that it requested the Government of Japan to provide grant aid to cover the required funds.

(2) Objectives

In order to support the strengthening and expansion of information transmission by television broadcasting as pointed out in the First Five Year Plan, the Project aims to improve the program production and broadcasting capacity of the Aden Station of the General Corporation for Radio and Television of Yemen through rehabilitating and renewing deteriorated broadcasting equipment at the said station, and also to qualitatively improve and quantitatively enhance television broadcasting throughout all Yemen with a goal of achieving equipment compatibility and strengthening of mutual cooperation between the said station and the Sana'a Station.

Chapter 2.

Contents of the Project

Chapter 2. Contents of the Project

2-1 Objectives of the Project

The Project is intended to rehabilitate the deteriorated broadcasting equipment of the Aden Station of the Yemen General Corporation for Radio and Television (hereinafter referred to as the General Corporation), with a view to qualitatively improving and quantitatively enhancing television broadcasting in Yemen founded on mutual linkage and cooperation between the said station and the Sana'a Station of the General Corporation.

Television broadcasting in Yemen is carried out by the General Corporation, which produces programs at the Sana'a Station (Headquarters) and the Aden Station (Branch).

Broadcasting equipment at the Sana'a Station was installed as a result of grant aid from Japan in March 1996, and the beneficial effects of this have been highly significant, in specific terms an approximate doubling of broadcasting time, an improvement in the quality of broadcast programs, and so on.

In contrast, the large proportion of broadcasting equipment at the Aden Station has been in use for 15 years or more and is in a badly deteriorated state. As a result, the said station is faced with great limitations to its program production, for example, the quality of television pictures have declined because of the deteriorated television camera or VTR and it is unable to carry out fine studio lighting, and so on.

The Project aims to install and improve broadcasting equipment at the Aden Station in place of the present deteriorated equipment, in order to improve the quality and increase the quantity of television programs produced by the said station.

2-2 Basic Concept of the Project

2-2-1 General of the Study

The Basic Study Team carried out a field survey on Aden Station.

At the field survey, the Study Team conducted a site survey and confirmed the contents of the request.

During the field survey, further new equipment was requested in addition to the original request.

Based on the data and information gathered from the field survey, the Study Team then analyzed in Japan the requested items from the Yemeni side.

As a result, the Study Team made the recommendation that the requested items should be supplied under Japan's Grant Aid Scheme.

2-2-2 Current Conditions and Handling of Existing Facilities and Equipment

(1) Facilities at the Aden Station

The building used by the Aden Station was not originally constructed as a television broadcasting center, but is simply a renovated five-story office building. Consequently, the ceiling height of the station's three television studios is low at around 4m, and this becomes 3m or less in places on the studio floors where air conditioning cooling ducts are installed.

Furthermore, six pillars and one pillar are in place on the floors of Studio 1 and Studio 2 respectively. As a result of the low studio floor ceiling height and pillars, etc., camera work is restricted and the local staff must skillfully utilize the studio floor space that exists between pillars when carrying out program production.

(2) Broadcasting Equipment at the Aden Station

A large proportion of broadcasting equipment at the Aden Station has been in use for at least 15 years: levels of deterioration and obsolescence are extreme and broken down items of equipment can be seen. Instead of the broken down equipment, temporally using equipment, such as video switcher, television camera and video monitor etc. cannot product effective program of good television pictures. With regard to studio lighting equipment, old large-type lanterns are used but those numbers are lacking and the degree of illumination for shooting television pictures is insufficient. Moreover, since lighting control equipment is broken down beyond repair, fine lighting adjustments for individual lanterns cannot be carried out.

There are two OB vans, however, only one large OB van is in an operating state. The one small OB van cannot be used because it was stolen and stripped of its onboard equipment during the era of internal conflict.

In spite of the said conditions, there is a strong desire among staff of the Aden Station to raise the level of broadcast programs and, with a view to enhancing news broadcasting, renewal of broadcasting equipment (excluding lighting equipment) in Studio 2 was carried out in the first half of 1997 through the station's own funding.

1) Existing Equipment at the Aden Station

The major items of equipment currently installed at the Aden Station are as follows;

a)	Studio 1 (155 m^2)	1 room	(video & audio equipment deteriorated)
b)	Studio 2 (50 m^2)	1 room	(video & audio equip. renewed lighting equipment deteriorated)
c)	Studio 3 (33 m^2)	1 room	(video, audio & lighting equipment deteriorated)
d)	Editing systems	2 sets	
e)	Master control equipment	1 set	(function declined because of spare parts shortage)
f)	Outdoor shooting equipment	2 sets	
g)	Small OB van	1 set	(only vehicle with no onboard equip.)
h)	Large OB van	1 set	(equipment deteriorated, but operation is possible)
i)	Telecine equipment	2 sets	(one set of equipment broken down)

j) Satellite receiving equipment.. 2 sets

2) Studio Equipment

The Aden Station possesses three studios and these are used to produce 35 programs per week.

a) Studio 1

Studio 1 currently possesses no proper studio television cameras and must share the cameras of the large OB van. If studio television cameras can be newly provided, the said camera sharing can be avoided, and the operating time of both Studio 1 and the large OB van can be increased. Moreover, regarding the lighting equipment used in Studio 1, since deterioration is extreme and the average level of illumination is low, it is necessary to install additional lanterns and new lighting control equipment.

b) Studio 2

Studio 2 is used to send out news and produce other programs. Video and audio equipment in this studio was renewed through local funding in the first half of 1997, however, since lighting equipment is insufficient, it is necessary to install additional lanterns and new lighting control equipment.

c) Studio 3

Studio 3 is a small studio with an area of $33m^2$. The studio control room also acts as the master control room and is used for sending out program continuity (program start and finish times) and short broadcasts between main programs. Apart from these broadcasting times, Studio 3 is also used for program production. As a result, it is necessary for the studio to always be in a usable state in the same way as the master control room during broadcasting times. Speaking from the viewpoint of program production (which is the main objective of the studio), it is not desirable to install the studio control room, which is used for program production, and the master control room, which is used for sending out programs, in the same place due to the differing nature of the said two functions. In the Project, in order to transfer the master control to a different place, it is necessary to make the existing master control room separate from Studio 3 and renew all the video, audio and lighting equipment

in Studio 3 that is badly deteriorated.

3) Editing Systems

Editing systems are used to edit VTR-recorded program resources and compile them into single programs in accordance with the desired production goals. Therefore, editing systems need to be of a scale that complies with recording equipment (studios, OB vans, outdoor shooting equipment, etc.).

However, there are currently only two editing systems in a usable state and this is proving to be a bottleneck in the production of programs.

4) Master Control Room Equipment

The master control room is the heart of the Aden Station used to distribute and monitor video and audio signals within and beyond the station and also finally select and send out programs to transmitter stations and the Sana'a Station (the program transmission line to the Sana'a Station is currently being installed by the Yemeni side).

The existing master control room equipment was newly installed in 1981 in line with the introduction of color broadcasting, however, breakdowns caused by deterioration over time are frequent, and main items of equipment such as the video switcher and audio switcher are used by making use of replacement parts on hand. However, since the said spare parts are no longer in production, it is difficult to carry out repairs. In addition, because monitors purchased on the general market are used to monitor programs and there is no precise clock system, the master control room is operated in a state where it cannot fulfill its inherent functions and control of broadcast programs and broadcast times cannot be carried out.

In the current situation, because much time is required in maintaining the existing equipment and this makes it difficult to expand broadcasting time, it is necessary to renew all the deteriorated equipment and build a proper master control system through the installation of currently lacking items.

5) Outdoor Shooting Equipment

There are only two sets of outdoor shooting equipment in an operating state and this is not a sufficient number. With the aim to increase broadcast programs and to produce nationwide broadcasting programs related to local areas, provision of portable type outdoor shooting equipment is essential and it is necessary to provide

at least two new sets.

6) Measuring Equipment

Proper maintenance work on an everyday basis is necessary in order to preserve broadcasting systems in a good state, and measuring equipment that enables the condition of equipment to be accurately understood is required. In relation to the expansion of the national broadcasting network currently being carried out by the General Corporation, it is necessary to comprehensively measure and evaluate picture and sound quality of television broadcasting facilities (including transmitter stations) across the country.

Since the Aden Station currently does not possess such measuring equipment, the task of measuring has to be done during non-broadcasting hours.

For the purpose of increasing broadcasting hours in the future, provision of measuring equipment is necessary.

7) OB Vans

The Aden Station currently possesses one large OB van and one small OB van that has no onboard equipment. The heavy weight of the large OB van means that it has trouble climbing hills and its range of use is thus limited to Aden and its immediate vicinity. Since the Aden Station is planning to implement national broadcasting of educational programs in the future, it requires a new mini OB van (with high maneuverability) in addition to the said large OB van.

As was mentioned previously, since the building of the Aden Station was originally constructed as an office building, restrictions are placed on the functions of the television studios due to the low height of the studio floor ceilings and the existence of pillars on the studio floors. As a result, the Aden Station relies greatly on OB vans to produce programs. Moreover, since it would not be appropriate to supply only onboard equipment for the existing small OB van due to the fact that the said van is more than 15 years old and it would be difficult for the van to fulfill its intended functions, provision of a new mini OB van is considered necessary.

2-2-3 Contents of the Request

Based on the resulting full list (Items Requested by the Government of Yemen) of requested equipment, consultations were carried out with the Yemeni side and an order of priority (A, B

or C) was determined for each requested item. Based on this order of priority, examination was carried out by the Japanese side and a recommendation was made regarding the items of equipment to be supplied under the Project.

The summary of requested equipment is shown in Table 2-2-1.

Table 2-2-1 Summary of Requested Equipment

Item	Quantity	Priority
1. Studio 1		
1) Video Equipment	1 set	A
2) Audio Equipment	1 set	A
3) Lighting Equipment	1 set	A
2. Studio 2		
1) Lighting Equipment	1 set	A
3. Studio 3		
1) Video Equipment	1 set	A
2) Audio Equipment	1 set	A
3) Lighting Equipment	1 set	A
4. Editing System		
1) Single Step System	2 sets	A
2) A/B Roll System	1 set	A
5. Master Control Room		
1) Video/Audio Switcher	1 set	A
2) 1/2, 3/4 inch VTR	6 sets	A
3) 1 inch VTR	1 set	C
6. Outdoor Shooting System	3 sets	A
7. Small OB Van	1 set	B
8. Large OB Van	1 set	B
9. Measurement Equipment	1 set	B
10. Computer Graphics	1 set	C
11. Mini OB Van (including microwave link)	1 set	A

Note: Priority A : First Priority (Strongly Requested)
B : Second Priority (Requested)
C : Third Priority (Requested, if possible)

2-3 Basic Design

2-3-1 Design Concept

(1) Basic Concept

Design shall be carried out with consideration of the construction of the most effective system that complies with the objectives of the Project and falls within the range of the grant aid scheme of Japan. Design shall be conducted with consideration capacity of program production and broadcasting hours in Sana'a Station and given to following basic items:

1) With a view to achieving a total system (including the existing equipment) that allows full compatibility, optimum system design that is also cost effective shall be carried out
   Regarding equipment design work and connections between existing and new equipment, consideration shall be given to methods that do not cause interference to the normal operation of existing equipment

2) Regarding the selection of individual items of equipment, consideration shall be given to the technical level of the local side and the potential for future expansion, with priority placed on ease of operation and maintenance, economy and ease of spare parts procurement

3) Equipment specifications shall basically be set in compliance with ITU-R technical standards and ample consideration shall be given to robustness and electrical and mechanical stability
   In particular, the peculiar natural environment (sand and dust, salt damage, high temperatures, high humidity, etc.) in Yemen shall be taken into account.

(2) Criterion of Equipment Selection

Consideration was given to the following points when setting the contents and scale of equipment to be provided based on the aforementioned contents of the request.

1) To give full consideration to the future plans of the Aden Station;
   - Broadcast programs - implementation of nationwide educational television broadcasting
   - Broadcasting time - expansion of broadcasting time by two hours per day (forwarding of the daily start time) in each year following Project completion (the immediate goal is to achieve around 15 hours of broadcasting per day)

2) To basically select items of requested equipment that have been given an 'A' ranking

3) To lower the priority ranking of the items of equipment which can be easily purchased in local market

4) To give consideration to compatibility with existing equipment at the Sana'a Station and within the Aden Station

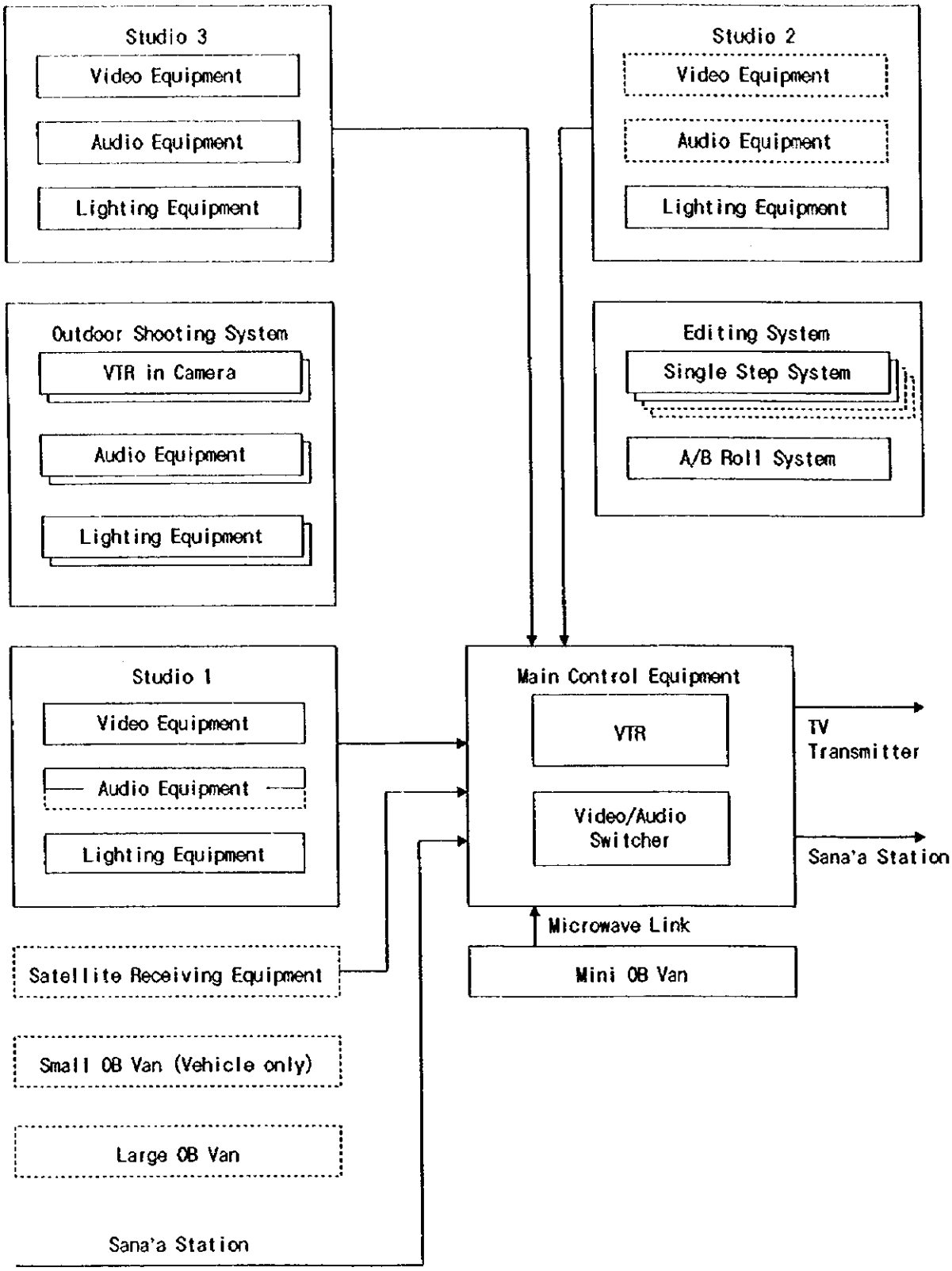
5) Not aim for a digital system

6) To take the local staff capacity for equipment operation and management into account

(3) Selected Equipment

The basic composition of the system shall be more or less the same as the existing system. Figure 2-3-1 shows the system composition.

The major equipment selected based on the aforementioned concept on equipment selection is shown in Table 2-3-1.



Dotted Line(----) Existing equipment to be used continuously after the completion of the Project

Figure 2-3-1 System Composition of Aden Station

Table 2-3-1 Summary of Selected Equipment

Item	Quantity	Priority	
1. Studio 1			
1) Video Equipment	1 set	A	○
2) Audio Equipment	1 set	A	○
3) Lighting Equipment	1 set	A	○
2. Studio 2			
1) Lighting Equipment	1 set	A	○
3. Studio 3			
1) Video Equipment	1 set	A	○
2) Audio Equipment	1 set	A	○
3) Lighting Equipment	1 set	A	○
4. Editing System			
1) Single Step System	2 sets	A	○
2) A/B Roll System	1 set	A	○
5. Master Control Room			
1) Video/Audio Switcher	1 set	A	○
2) 1/2, 3/4 inch VTR	6 sets	A	○
3) 1 inch VTR	1 set	C	—
6. Outdoor Shooting System	2 sets	A	△
7. Small OB Van	1 set	B	—
8. Large OB Van	1 set	B	—
9. Measurement Equipment	1 set	B	△
10. Computer Graphics	1 set	C	—
11. Mini OB Van (including microwave link)	1 set	A	○

Note: Priority A : First Priority (Strongly Requested)
B : Second Priority (Requested)
C : Third Priority (Requested, if possible)
○ : Selected Equipment
△ : To be supplied (a part of requested equipment)
— : Not to be supplied

2-3-2 Basic Design

(1) Studio Equipment

VTR, sync signal generators, audio equipment and lighting equipment shall be provided in each studio to enable them to carry out normal program production without being affected by master control equipment and activities in other studios. This will also make it easier to carry out maintenance of master control equipment and the studios.
Moreover, with a view to the production of large-scale programs, the master control room shall be made a focal point for providing mutual linkage between studios, with OB vans and between VTR, etc. of the master control room.
Regarding suspension equipment for lanterns, since the ceiling height of studio floors is low, the movable rail batten type shall be adopted instead of the widely used elevational batten type.
In addition to the improvement in picture quality that can be expected as a result of this studio equipment renewal, the introduction of lighting control equipment and video special effect equipment will make it possible to fully utilize a wide range of program production techniques in creating more varied television pictures for viewers.
Furthermore, concerning the sound quality of television programs, audio effect equipment and CD players, etc. shall be installed to enable the production of sounds that fit with television picture contents and thus raise the overall quality of broadcast programs.

1) Studio 1

It is generally the case when producing programs in the studio to use a video switcher installed in the studio control room for mixing and compiling into one program images that are shot by a number of cameras. This studio will be used to produce programs on dialogues, panel discussions, commentaries or lectures, cooking, handicrafts, school science experiments, those that accompany some kinds of performances, smaller to medium scale music programs, dancing, viewer participation programs such as quiz shows where children take part, and skits etc.
Various camera work will be required, including long shots, closeups of faces and hands, scenes, etc. Three cameras will be installed in the studio as a minimum requirement. However, the movement of cameras in Studio 1 is restricted by six pillars located on the studio floor. As a result, each camera must be placed in set

positions on the studio. For this reason, it is necessary to utilize various ideas in operating the cameras.

Regarding audio equipment, since the existing audio mixer is relatively new and fully fit for use, this shall continue to be used.

Concerning lighting equipment, the lattice beams on the existing studio ceiling shall be used to install movable rail type suspension equipment, the minimum required number of lanterns shall be supplemented and lighting control equipment shall be installed. Furthermore, some special lanterns shall be added to enable lighting special effects, and this will give some variety to the program production techniques that can be adopted on this highly restricted studio floor.

2) Studio 2

As was mentioned previously, since the video and audio equipment of this studio has recently been renewed, only lighting equipment shall be supplied under the Project.

In addition to lighting control equipment, the lattice beams on the existing studio ceiling shall be used as in Studio 1 to install movable rail type suspension equipment and additional lanterns shall be provided.

3) Studio 3

The studio control room and master control room of Studio 3 are currently located in the same room, however, the master control room shall be made a separate room under the Project in order to give it independent program production functions.

Regarding video equipment, the minimum necessary two cameras shall be renewed and the deteriorated video switcher shall also be renewed.

As for lighting equipment, lighting control equipment shall be introduced and the number of lanterns supplemented. The lanterns shall be suspended from the pipes currently in place under the ceiling.

Furthermore, in consideration of the additional usage of this studio for program continuity, one Teleprompter (for showing writing in front of the camera lens) shall be installed to allow announcers to read broadcast drafts without having to look downwards.

Therefore, this studio shall also be used as an emergency backup studio for sending out news, which is usually broadcast from Studio 2.

(2) VTR

Digital VTR which leads to only a small amount of picture quality deterioration in VTR tape editing (an indispensable process in program production) shall basically be introduced.
Also, ample consideration shall be given to program exchange with the Sana'a Station by means of analog VTR tape.

- The selected digital VTR shall also be capable of playing back analog VTR tapes (including tapes recorded at the Sana'a Station).
- In cases where recording by analog VTR is necessary (including dispatch of tapes to the Sana'a Station), it shall be possible to use the newly provided VTR for this purpose together with the analog VTRs that are already in place.

Figure 2-3-2 gives a full overview of the VTR equipment to be provided.

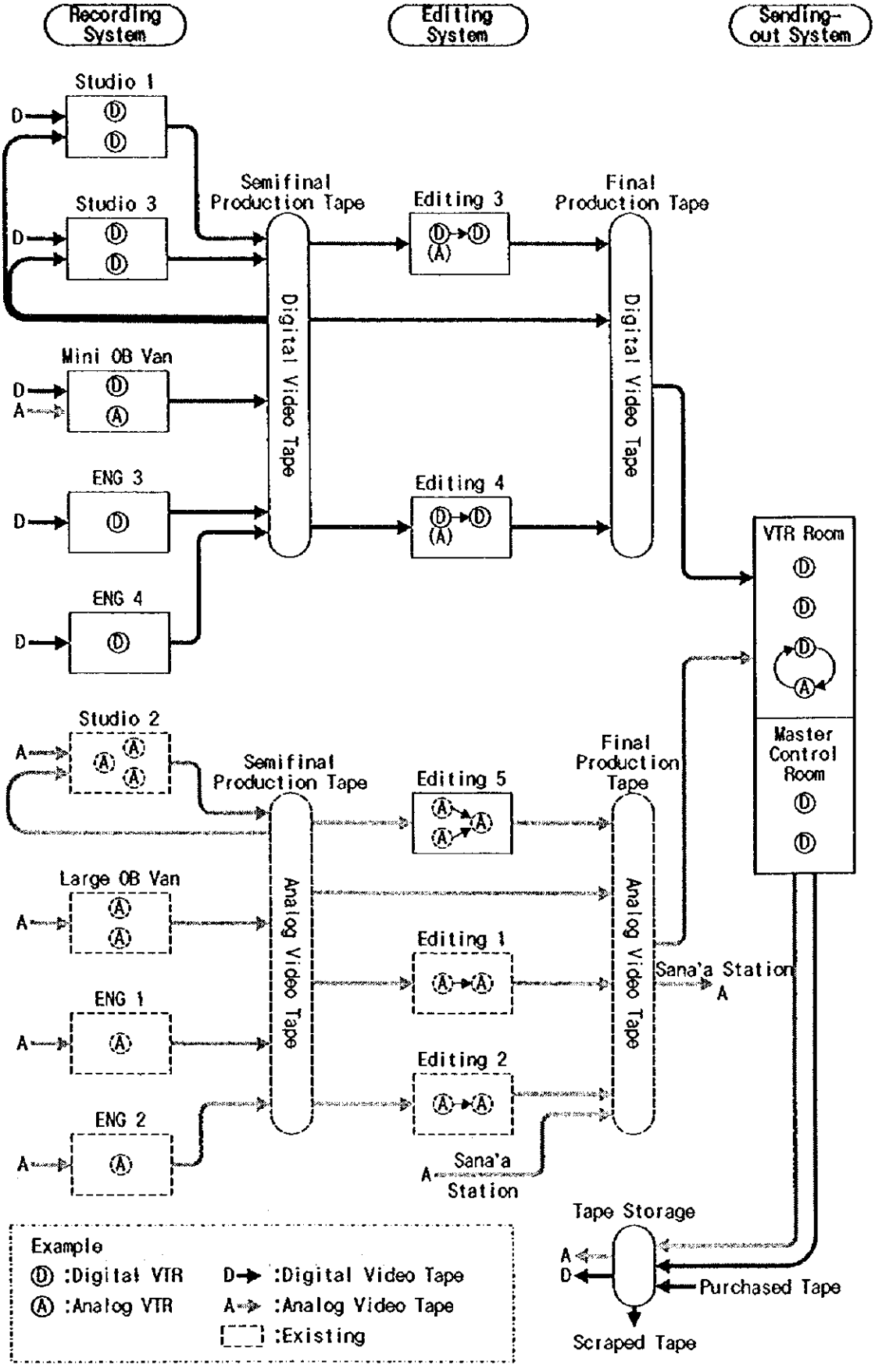


Figure 2-3-2 VTR Tape Flow (Analog, Digital) in Aden Station

(3) Editing System

From the consideration of recorded VTR tape and the capacity of the editing system, one editing system shall be used for each studio and two shall be used for the OB vans (one existing and one new) and the outdoor shooting equipment (two existing and two new sets).

Recording Systems	Editing Systems
• Studio 1, Studio 2, Studio 3	3 sets
• OB vans and outdoor shooting equipment	2 sets
Total	5 sets

Since the existing two editing systems are in a usable state, three systems shall be additionally installed.

One A/B roll editing system (two playback VTR, one recording VTR), which can perform high level production techniques such as composite editing of two tape sources, shall be introduced for use in the after processing of drama recordings, etc.

The two other editing systems to be introduced shall be the basic single step editing type (one playback VTR, one recording VTR).

(4) Master Control Equipment

1) Signal Distribution System

Output signals from the studios, the VTRs, telecine, the Sana'a Station, field pickup and satellites, etc. shall be selectively sent out according to necessity to the studios, VTR input and master control input, etc.

2) Master Switcher

Programs from the studios, VTR, the Sana'a Station and outside, etc. shall be selectively sent out to television transmitter stations in accordance with the broadcasting schedule.

Moreover, the system shall be capable of selectively sending out programs to the Sana'a Station irrespective of television transmitter stations.

3) Telecine

The television transmission of movie film shall be carried out by VTR recording and playback, without conducting direct broadcasting. This will prevent the interruption of broadcasts caused by the cutting or stopping of film during transmission.

Furthermore, by recording film in VTR, it will be possible to use the VTR in each studio control room for inserting film screens during studio program production, and this will make operation easier for staff.

Incidentally, the existing one telecine set shall not be renewed.

4) Other Items

a) Room to Room Communication System

Interphones shall be installed to allow communication between rooms that are directly concerned with broadcasting.

b) Clock System

A clock system shall be installed to display accurate time, which is essential for sending out programs, in all concerned rooms.

A master clock for generating standard signals shall be installed in the master control room and this shall be linked to slave clocks installed in each room.

c) Community Antenna TV System

For the purpose of supervision and examination of the broadcasting programs, a community antenna TV system shall be installed to receive and distribute to necessary places broadcast television waves and thus enable related persons to view broadcasts on television sets.

(5) Outdoor Shooting Equipment

Two portable type cameras that integrate VTR with cameras, two sets of portable type audio recording equipment, and two sets of lighting equipment shall be provided. All the said equipment shall be operable by battery in order to secure mobility.

(6) OB Van

A mini vehicle shall be fitted with necessary equipment and an engine generator used as a mini OB van with high maneuverability. The van shall be fitted with two cameras, an onboard VTR for recording scene footage, and micro-wave link equipment to enable live broadcasting from outdoor scenes.

(7) Measuring Equipment

Proper maintenance work on an everyday basis is necessary in order to preserve broadcasting systems in a good state, and measuring equipment that enables the condition of equipment to be accurately understood is required. Robust measuring equipment that is easy to use and reliable (oscilloscope, TV test signal generator, audio characteristics measuring device, circuit tester, etc.) shall be provided in accordance with necessary maintenance items.
Also, a device for inserting TV test signals into the television signals sent out by the Aden Station shall be provided.

(8) Spare Parts

The thinking regarding the supply of spare parts to Aden Station under the Project can be summarized as follows.

1) Basic Thinking

a) Only items that can be easily replaced by local staff shall be considered.

b) Spare parts consisting mainly of printed circuit boards and units for major equipment shall be supplied, with the aim of enabling the procured equipment to operate trouble-free for approximately 3 years after handing over.
However, in light of the fact that suppliers guarantee equipment free of charge for 1 year, spare parts other than expendable items shall not be considered for this period.

2) Range of Spare Parts

Spare parts shall cover printed circuit boards, units and expendable items.

a) Printed Circuit Boards and Units

Printed circuit boards and units shall process designated electrical performance levels and be easily replaceable. (Replacement, repair and reuse shall be possible.)

b) Expendable Items (excluding video and audio tape)

① Lamps and Fuses

Items that become unusable as a result of disconnection, etc. (replace after wearing out)

② Relays, Switches and Magnetic Heads

Items in which performance deteriorates due to mechanical abrasion (replace according to hours of use, etc.)

c) Order of Priority of Spare Parts

Items that have major effects on systems if they break down, and items that have a relatively higher incidence of breakdown (power supply units, etc.) shall be given priority in supply.

2-3-3 Equipment Plan

The outline of the main equipment list and specifications are as follows.

1. Studio 1 (166m²)

1)	Color camera	3 sets	3-FIT CCD digital processing camera, with 5" viewfinder, zoom lens more than 14 times, 25m, 50m camera cable
2)	Pedestal	3 sets	
3)	Video production switcher	1 set	Digital 12 inputs, 2M/K
4)	Digital video effect	1 set	3 dimensions

5)	1/2 inch VTR	2 sets	Digital play/rec. with monitor
6)	Character generator	1 set	English and Arabic
7)	Sync. pulse generator	1 set	
8)	Monitoring equipment		
	a) Waveform monitor	1 set	
	b) Vector scope	1 set	
	c) 14 inch color master monitor	1 set	Precision type
	d) 14 inch color monitor	10 sets	
	e) 20 inch color monitor	2 sets	
	f) 21 inch color monitor	2 sets	With carts
	g) 21 inch television receiver	1 set	
9)	Monitor shelf	1 set	
10)	Video, sync. distribution amplifier	1 set	Necessary amount of amplifiers for making up system to be included
11)	Video equipment rack	1 set	Including jack panel and internal wiring
12)	Video operation console	1 set	
13)	Audio operation console	1 set	For 22 inputs existing audio mixer
14)	Audio monitor	6 sets	With power amplifier
15)	Tape recorder	2 sets	Open reel type
16)	Cassette tape recorder	1 set	
17)	CD player	1 set	
18)	Rack for CD and CTR	1 set	With monitor
19)	Audio distribution amplifier	1 set	Necessary amount of amplifiers for making up system to be included
20)	Audio equipment rack	1 set	Including jack panel and internal wiring
21)	Production intercom	1 set	
22)	Audio effect equipment	2 sets	
23)	Microphones and mic. stand		
	a) Desk top type condenser mic.	2 sets	For talking
	b) Electret condenser mic.	2 sets	Lavaliere type

c)	Uni-directional condenser mic.	4 sets	For general purpose
d)	Selectable directivity condenser mic.	4 sets	For music
e)	Dynamic mic.	4 sets	For vocal
f)	Mic. extension cable	10 rolls	
g)	Microphone boom stand	1 set	
h)	Mini microphone boom stand	3 sets	
i)	Goose neck floor stand	2 sets	
j)	Microphone floor stand	2 sets	
k)	Table microphone stand	2 sets	
24)	Studio lighting equipment		
a)	Suspension devices	1 set	Movable rail system
b)	Lantern and accessory	1 set	
c)	Lighting control equipment	1 set	Dimmer 2.5kW, 24 pieces
d)	Curtain system	1 set	
e)	Effect projection system	2 sets	Projector 2.5kW/1kW
25)	Miscellaneous items	1 set	

2. Studio 2 (50m²)

	Studio lighting equipment		
a)	Suspension devices	1 set	Movable rail system
b)	Lantern and accessory	1 set	
c)	Lighting control equipment	1 set	Dimmer 2.5kW, 18 pieces
d)	Curtain system	1 set	

3. Studio 3 (33m²)

1)	Color camera	2 sets	3 FIT CCD digital processing camera, with 5 inch viewfinder, zoom lens more than 14 times, 25m, 50m camera cable
2)	Tripod	2 sets	With dolly
3)	Teleprompter	1 set	
4)	Video production switcher	1 set	Digital 12 inputs, 2 M/K
5)	Digital video effect	1 set	3 dimensions
6)	1/2 inch VTR	2 sets	Digital play/rec. with monitor

7)	Telop system	1 set	
8)	Character generator	1 set	English and Arabic
9)	Sync. pulse generator	1 set	
10)	Monitoring equipment		
	a) Waveform monitor	1 set	
	b) Vector scope	1 set	
	c) 14 inch color master monitor	1 set	Precision type
	d) 14 inch color monitor	8 sets	
	e) 20 inch color monitor	2 sets	
	f) 21 inch color monitor	1 set	With cart
	g) 21 inch television receiver	1 set	
11)	Monitor shelf	1 set	
12)	Video sync. distribution amplifier	1 set	Necessary amount of amplifiers for making up system to be included
13)	Video equipment rack	1 set	Including jack panel and internal wiring
14)	Video operation console	1 set	Video switcher console VE console
15)	Audio mixer	1 set	16 inputs
16)	Audio monitor	4 sets	With power amplifier
17)	Tape recorder	1 set	Open reel type
18)	Cassette tape recorder	1 set	
19)	CD player	1 set	
20)	Rack for CD and CTR	1 set	With monitor
21)	Audio distribution amplifier	1 set	Necessary amount for amplifier for making up system to be included
22)	Audio equipment rack	1 set	Including jack panel and internal wiring
23)	Production intercom	1 set	
24)	Audio effect equipment	2 sets	
25)	Microphones and mic. stand		
	a) Desk top type condenser mic.	2 sets	For talking
	b) Electret condenser mic.	2 sets	Lavaliere type

c)	Selectable directivity condenser mic.	2 sets	For music
d)	Dynamic mic.	4 sets	For general purpose
e)	Microphone floor stand	2 sets	
f)	Mic. extension cable	10 rolls	
g)	Mini microphone boom stand	2 sets	
h)	Gooseneck floor stand	2 sets	
26)	Studio lighting equipment		
a)	Lantern and accessory	1 set	
b)	Lighting control equipment	1 set	Dimmer 2.5kW, 12 pieces
c)	Curtain system	1 set	
27)	Miscellaneous items	1 set	

4. Editing Equipment

1)	1:1 editing equipment	(2 sets)	
a)	1/2 inch VTR	2 sets	Digital play/rec.
b)	1/2 inch VTR	2 sets	Digital play with analog play
c)	14 inch color monitor	4 sets	With sound
d)	Desk	2 sets	With editor
2)	A/B roll editing equipment	(1 set)	
a)	1/2 inch VTR	1 set	Analog play/rec.
b)	1/2 inch VTR	2 sets	Analog play with slow motion
c)	Editor	1 set	
d)	Video switcher	1 set	8 inputs
e)	Audio mixer	1 set	8 inputs
f)	14 inch color monitor	5 sets	
g)	Desk	1 set	
h)	Audio monitor	2 sets	With power amplifiers

5. Master Control Room

5-1 VTR room equipment

1)	1/2 inch VTR	3 sets	Digital play/rec. with monitor
2)	1/2 inch VTR	1 set	Analog play/rec. with slow motion, monitor
3)	3/4 inch VTR	2 sets	U-matic VTR play/rec. with monitor
4)	Equipment rack	3 sets	Including jack panel, monitor and internal wiring

5-2 Master control room equipment

1)	Routing switcher	1 set	16 inputs 16 outputs, audio follow video
2)	Master switcher	1 set	16 inputs 2 output, audio follow video
3)	TV system converter	1 set	PAL/SECAM/NTSC
4)	1/2 inch VTR	2 sets	Digital play/rec. with monitor
5)	Sync. pulse generating equipment	2 sets	With test signal generator, automatic changeover switch
6)	Frame synchronizer (F/S)	1 set	With remote control panel
7)	VITS signal inserter	1 set	With VITS signal generator
8)	Station logo generator	1 set	
9)	Video timer	1 set	Digital display
10)	Monitoring equipment		
	a) Waveform monitor	2 sets	
	b) Vector scope	2 sets	
	c) 14 inch color master monitor	2 sets	Precision type
	d) 14 inch color monitor	12 sets	
	e) 20 inch color monitor	3 sets	
	f) 25 inch television receiver	2 sets	
11)	Monitor shelf	1 set	
12)	Video pulse distribution amplifier Video equalizing amplifier	1 set	Necessary amount of amplifiers for making up systems to be included
13)	Video processing amplifier	1 set	

14)	Video rack assembly	1 set	Including jack panel and internal wiring
15)	Operating console	1 set	Master switcher and VE monitor
16)	Audio monitoring equipment	3 sets	With VU meter panel
17)	Cassette tape recorder	1 set	
18)	Oscillator	1 set	1kHz
19)	Audio distribution amplifier	1 set	Necessary amount of amplifiers for making up systems to be included
20)	Audio limiting amplifier	1 set	
21)	Audio rack assembly	1 set	Including jack panel and internal wiring
22)	Room to room communication system	1 set	
23)	Clock system	(1 set)	
	a) Master clock	1 set	
	b) Slave clock	10 sets	
24)	Community antenna TV system	(1 set)	
	a) TV antenna (including distributor)	1 set	10 terminals
	b) 25 inch television receiver	10 sets	
25)	Miscellaneous	1 set	
26)	Uninterrupted power supply (UPS) equipment	1 set	5kVA
27)	Power distribution board	6 sets	
28)	Isolation transformer	1 set	50kVA

6. Outdoor Shooting Equipment

1)	VTR camera equipment	(2 sets)	
	a) FIT CCD portable camera	2 sets	With 15 times zoom lens
	b) 1/2 inch VTR	2 sets	Digital built-in camera
	c) Condenser microphone	2 sets	
	d) Rechargeable battery pack	20 pcs.	
	e) Battery charger	2 sets	
	f) AC power adapter	2 sets	
	g) Tripod	2 sets	With dolly

2)	Audio equipment	(2 sets)	
	a) Portable audio mixer	2 sets	4 inputs
	b) Condenser microphone	4 sets	
	c) UHF wireless microphone	2 sets	With UHF tuner
	d) Headphones	2 sets	
	e) Cassette tape recorder	2 sets	
	f) Accessories	2 sets	Battery, charger, carrying case
3)	Lighting equipment	(2 sets)	
	a) Battery lighting kit	2 sets	
	b) Portable lighting kit	2 sets	
	c) Accessories	2 sets	Battery, charger, carrying case

7.	**Mini OB Van**	1 set	
1)	Color camera	2 sets	3 FIT CCD digital processing camera with 5 inch viewfinder, zoom lens more than 18 times 150m camera cable
2)	Tripod	2 sets	With dolly
3)	Video production switcher	1 set	6 inputs 1M/K
4)	Audio mixer	1 set	8 inputs
5)	1/2 inch VTR	1 set	Digital play/rec.
6)	1/2 inch VTR	1 set	Analog play/rec. with slow motion & monitor
7)	Sync. pulse generating equipment	2 sets	With test signal generator, automatic change over switch
8)	Video monitoring equipment	1 lot	WFM, VSC, video monitor, TV receiver with antenna
9)	Audio monitoring equipment	1 set	Speaker with amplifier
10)	Cassette tape recorder	2 sets	
11)	Production intercom	1 set	
12)	Microphone and mic. stand	1 lot	
13)	Microwave link	1 lot	7GHz band TX RX 1 pair with standard accessory
14)	Walky talky	3 sets	5W
15)	Video, sync., audio equipment rack	1 set	

16) Portable lighting equipment	1 set	
17) Vehicle	1 set	Approx. 2m(W) × 6m(L) × 2.3m(H), with E/G (6kVA), AVR (5kVA), air conditioner

8. Measuring Equipment and Tools

1) TV test signal generator	1 set	Multiburst, pulse/bar, stair step, color bars
2) Audio measuring equipment	1 set	Frequency response, distortion factor, signal to noise ratio
3) Oscilloscope with cart	1 set	100MHz band width, dual inputs
4) Vector scope	1 set	
5) Illuminance meter	1 set	
6) Color temperature meter	1 set	
7) Circuit tester	5 set	Analog and digital
8) Tool set	6 sets	Standard tool set and hand tool sets
9) Special jig for VTR	1 set	
10) Standard tape for 1/2 inch VTR	2 sets	
11) Standard tape for open reel tape recorder	2 sets	

9. Spare Parts	1 lot	Refer to 2-3-2 (8) Spare Parts
10. Installation Materials	1 lot	Video cable, audio cable, control cable, power cable, connectors, etc.

2-3-4 Basic Design Drawings

(1) Site Plan

Figure 2-3-3 Site Plan of Aden Station

(2) Building Plan

Figure 2-3-4 Building Plan of Aden Station

(3) Equipment Layout

Figure 2-3-5 Equipment Layout of Studio 1 Studio Lighting
Figure 2-3-6 Equipment Layout of Studio 1 Sub-control Room
Figure 2-3-7 Equipment Layout of Studio 2 Studio Lighting
Figure 2-3-8 Equipment Layout of Studio 2 Sub-control Room
Figure 2-3-9 Equipment Layout of Studio 3 Studio Lighting
Figure 2-3-10 Equipment Layout of Studio 3 Sub-control Room
Figure 2-3-11 Equipment Layout of Master Control Room
Figure 2-3-12 Equipment Layout of Editing Room
Figure 2-3-13 Equipment Layout of Mini OB Van

(4) Schematic Diagram

Figure 2-3-14 Schematic Diagram of Studio 1 Video System
Figure 2-3-15 Schematic Diagram of Studio 1 Audio System
Figure 2-3-16 Schematic Diagram of Studio 3 Video System
Figure 2-3-17 Schematic Diagram of Studio 3 Audio System
Figure 2-3-18 Schematic Diagram of Studio Lighting System
Figure 2-3-19 Schematic Diagram of Master Control Room Video System
Figure 2-3-20 Schematic Diagram of Master Control Room Audio System
Figure 2-3-21 Schematic Diagram of Editing Room Video and Audio System
Figure 2-3-22 Schematic Diagram of Mini OB Van Video and Audio System
Figure 2-3-23 Schematic Diagram of Room to Room Communication System
Figure 2-3-24 Schematic Diagram of Clock System
Figure 2-3-25 Schematic Diagram of Community Antenna TV System

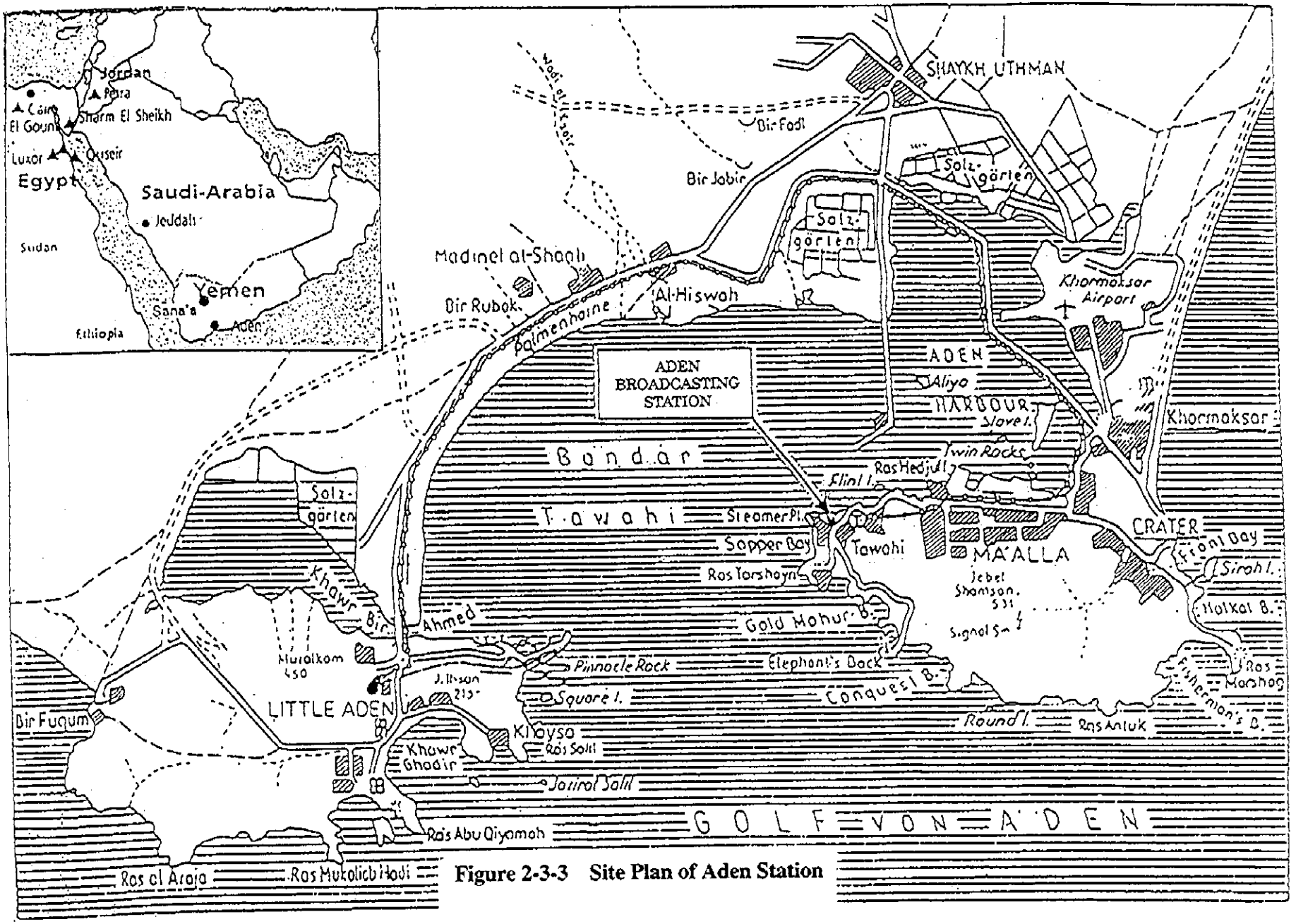


Figure 2-3-3 Site Plan of Aden Station

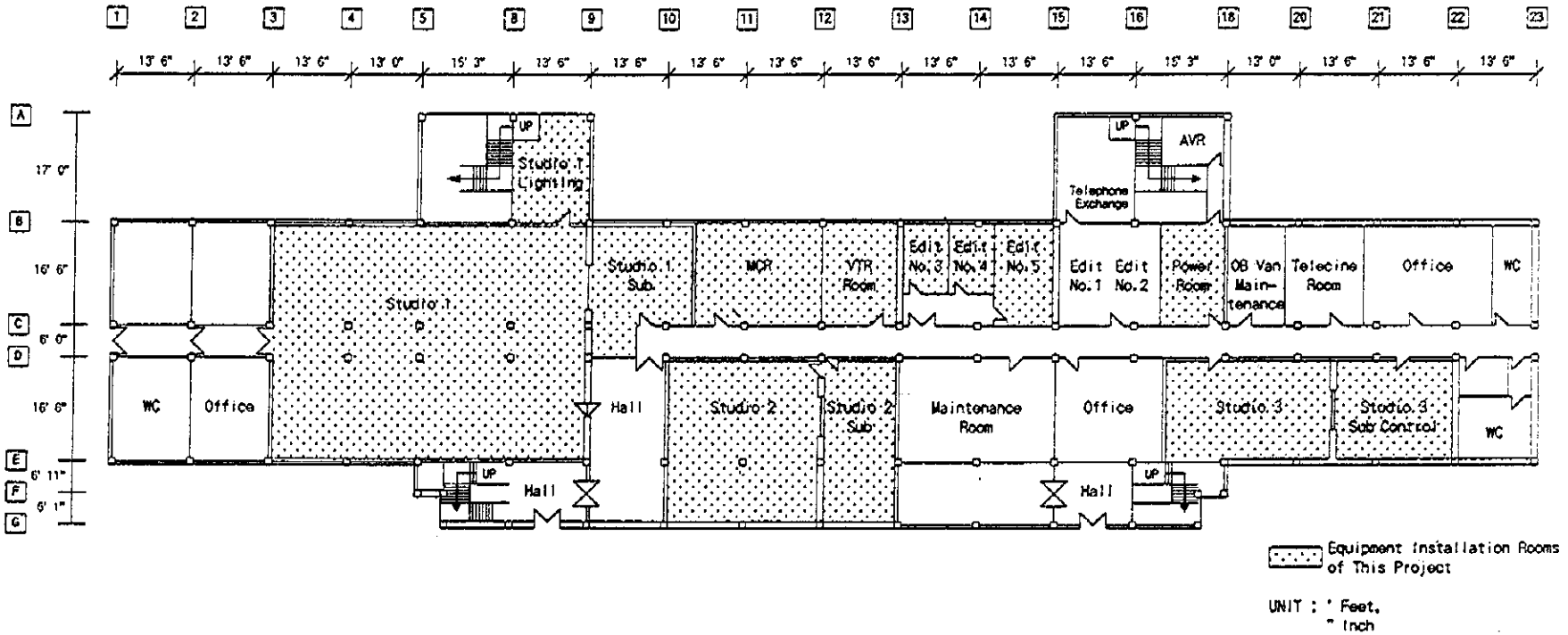


Figure 2-3-4 Building Plan of Aden Station

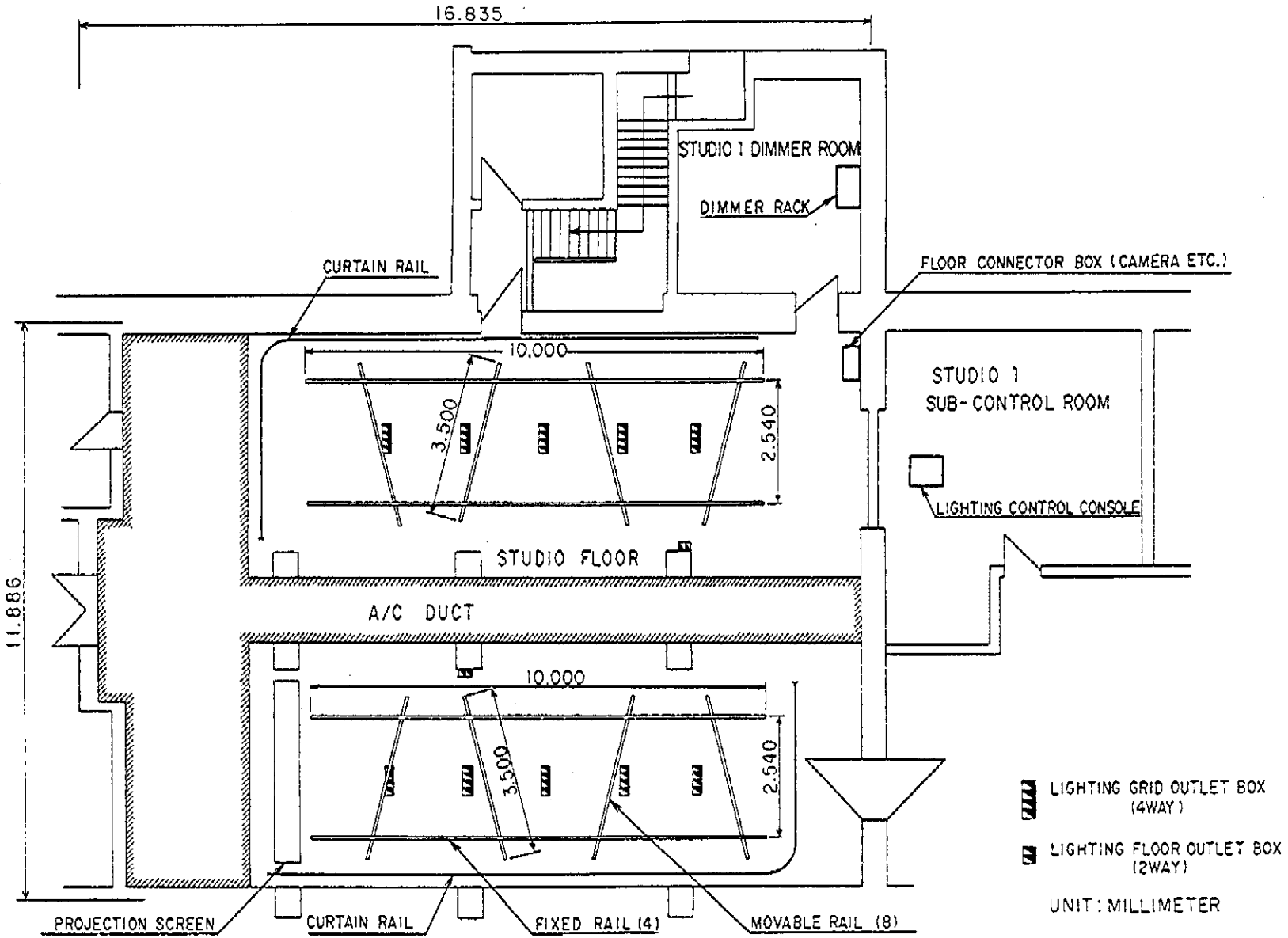


Figure 2-3-5 Equipment Layout of Studio 1 Studio Lighting

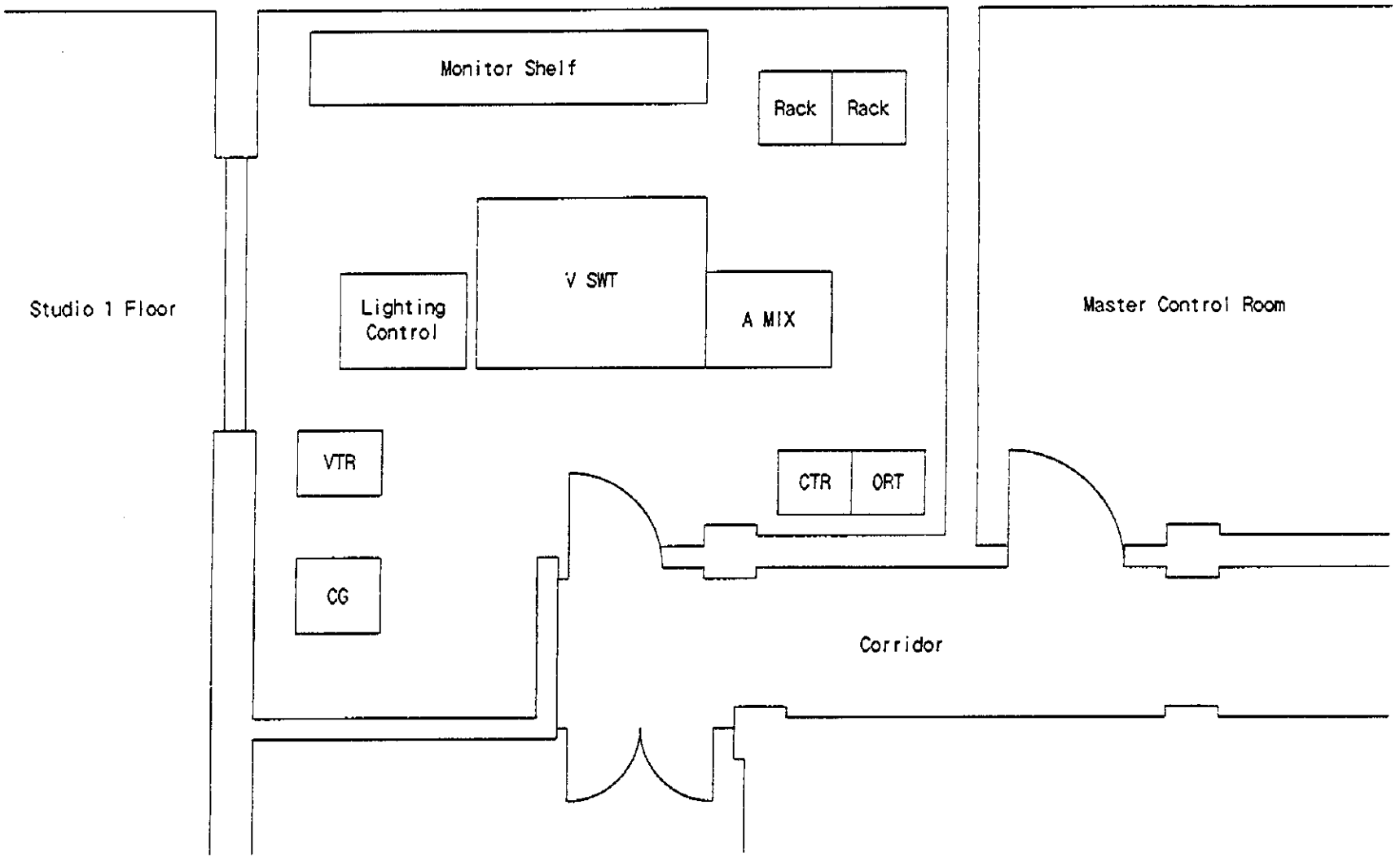


Figure 2-3-6 Equipment Layout of Studio 1 Sub-control Room

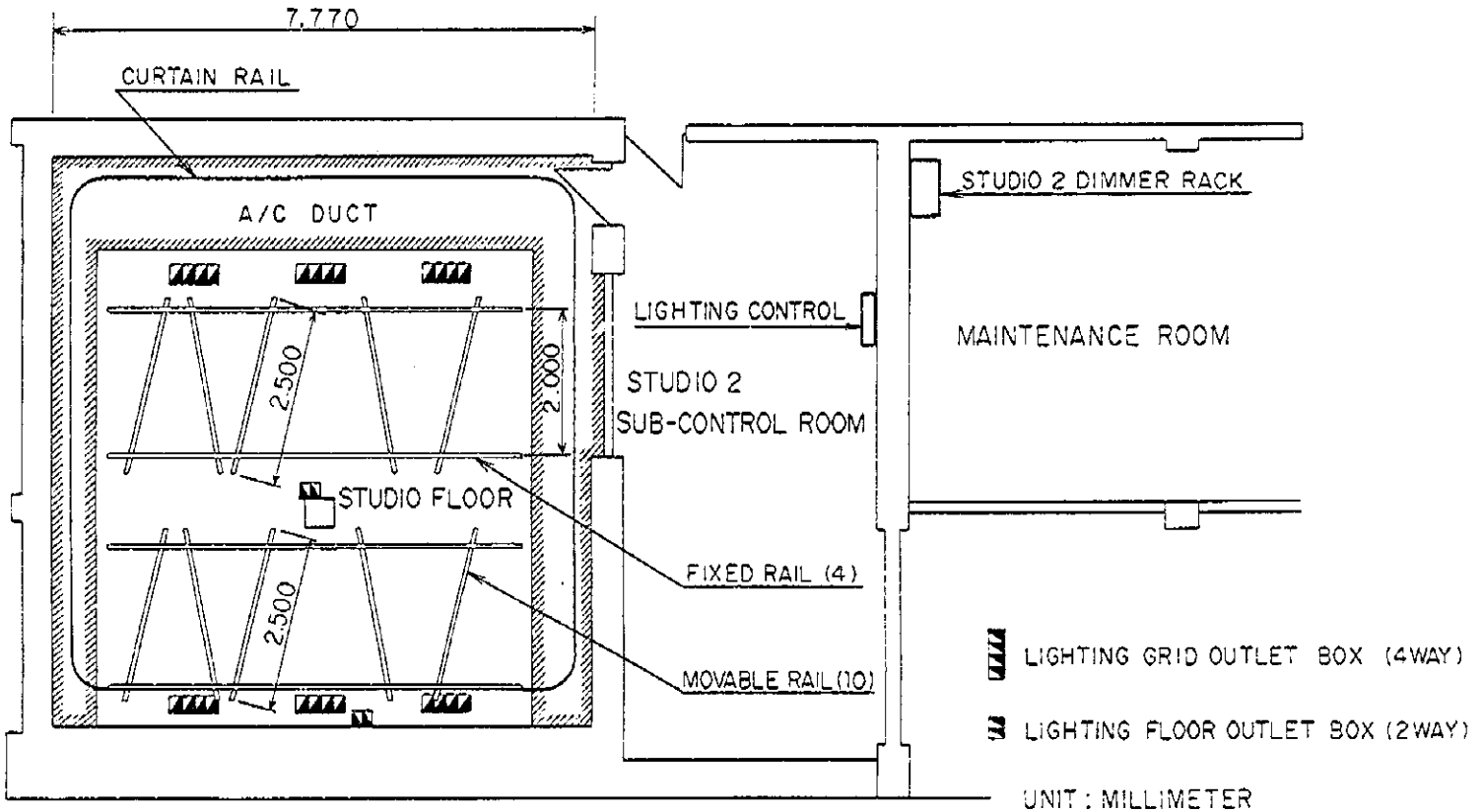


Figure 2-3-7 Equipment Layout of Studio 2 Studio Lighting

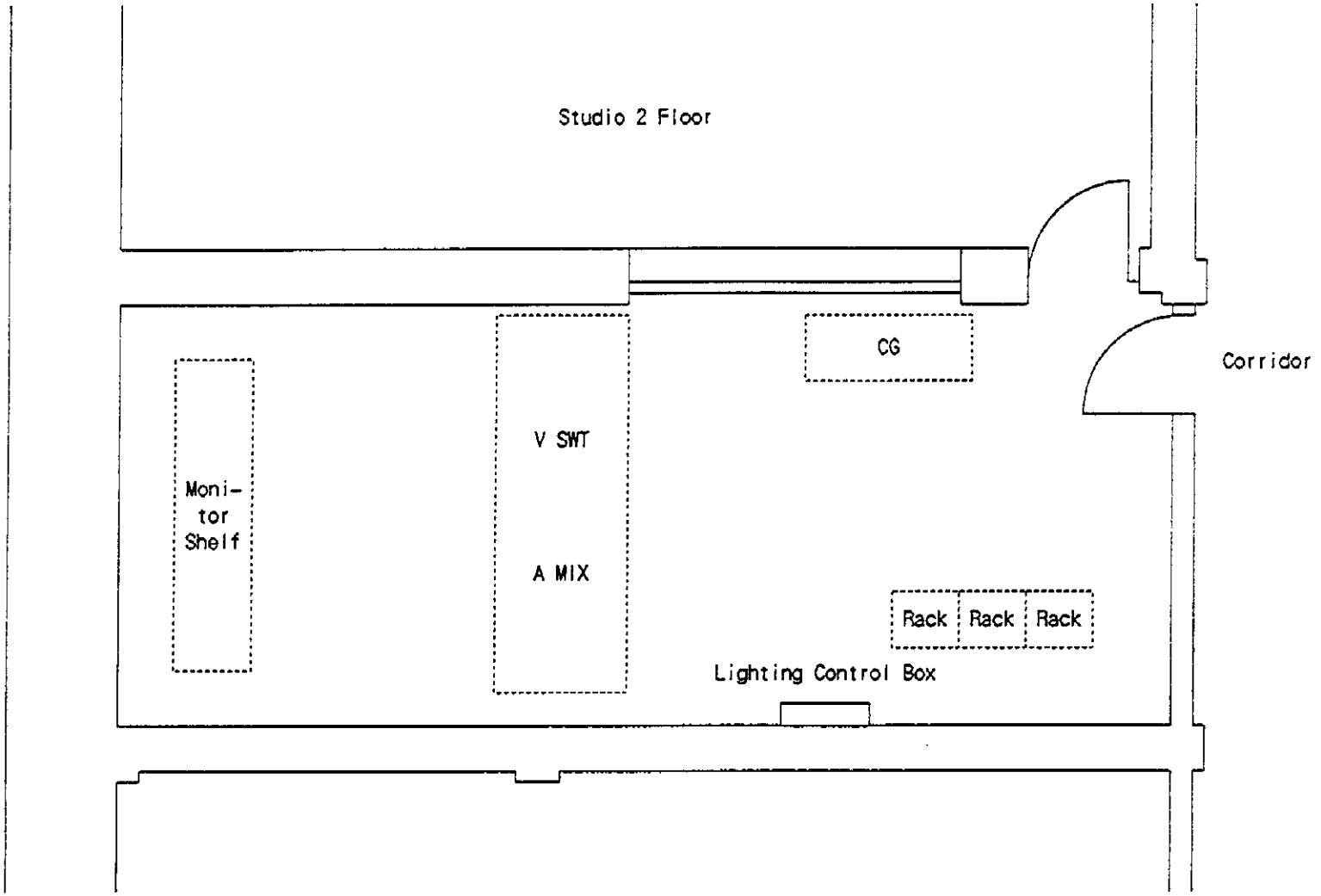


Figure 2-3-8 Equipment Layout of Studio 2 Sub-control Room

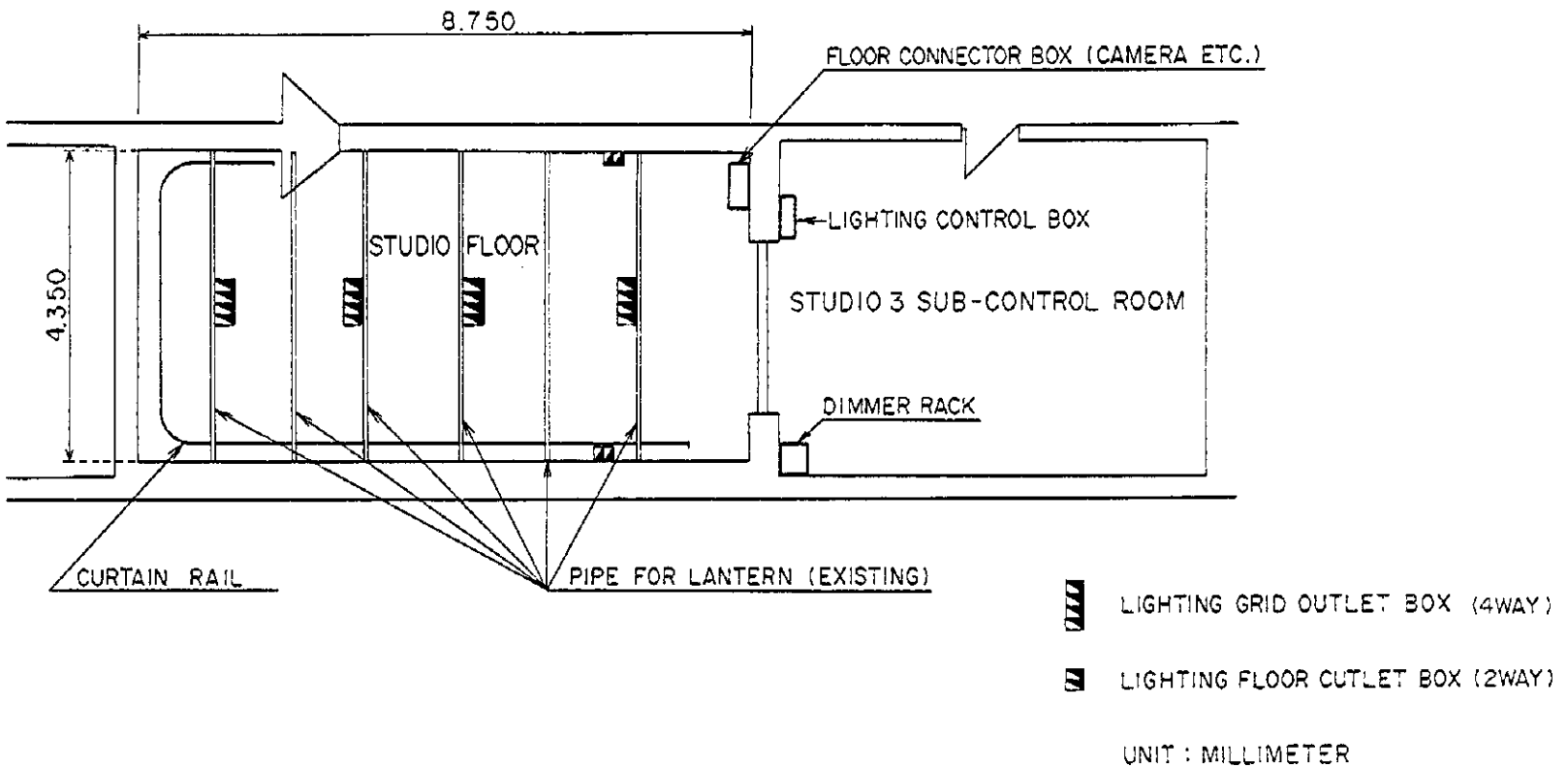


Figure 2-3-9 Equipment Layout of Studio 3 Studio Lighting

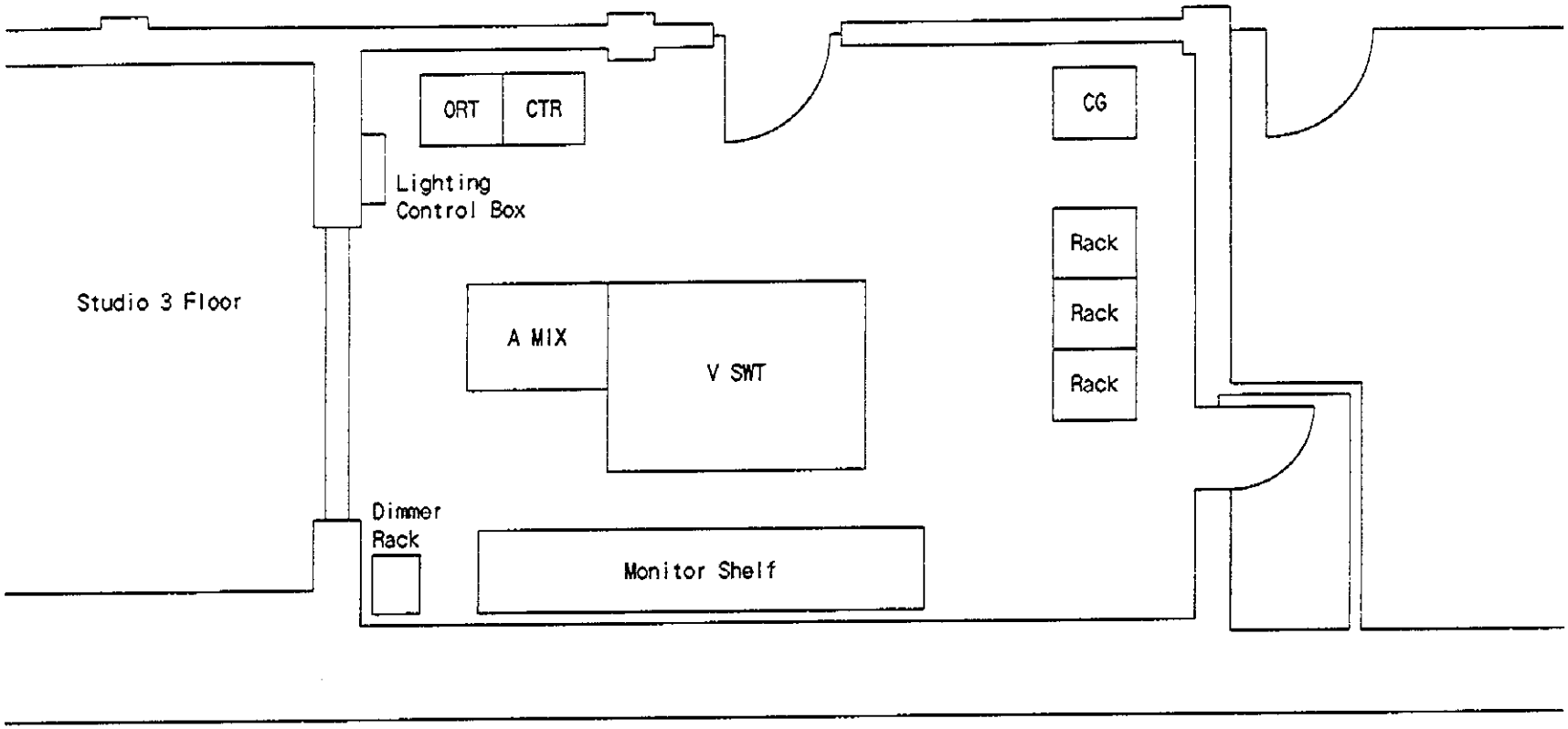


Figure 2-3-10 Equipment Layout of Studio 3 Sub-control Room

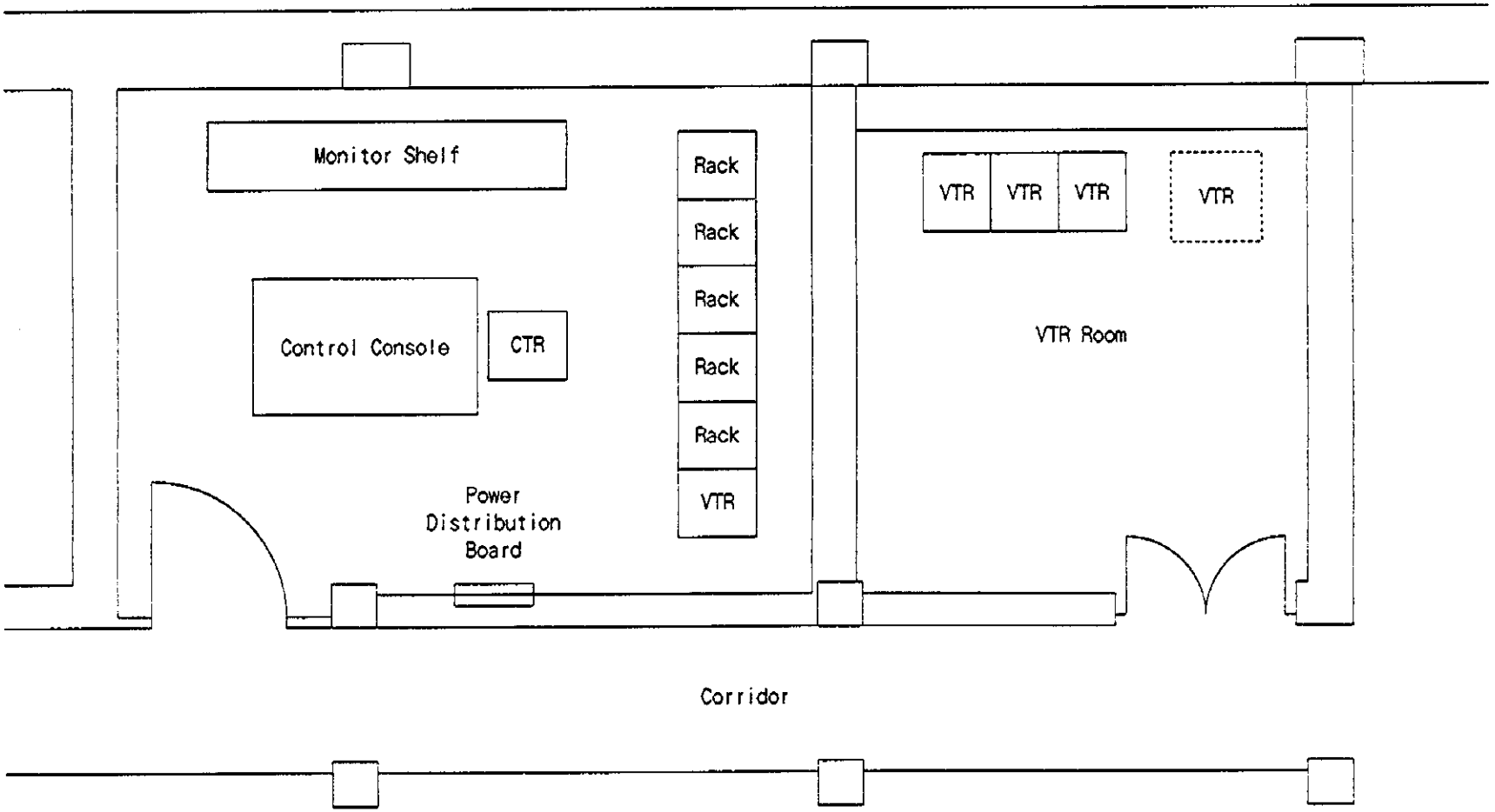


Figure 2-3-11 Equipment Layout of Master Control Room

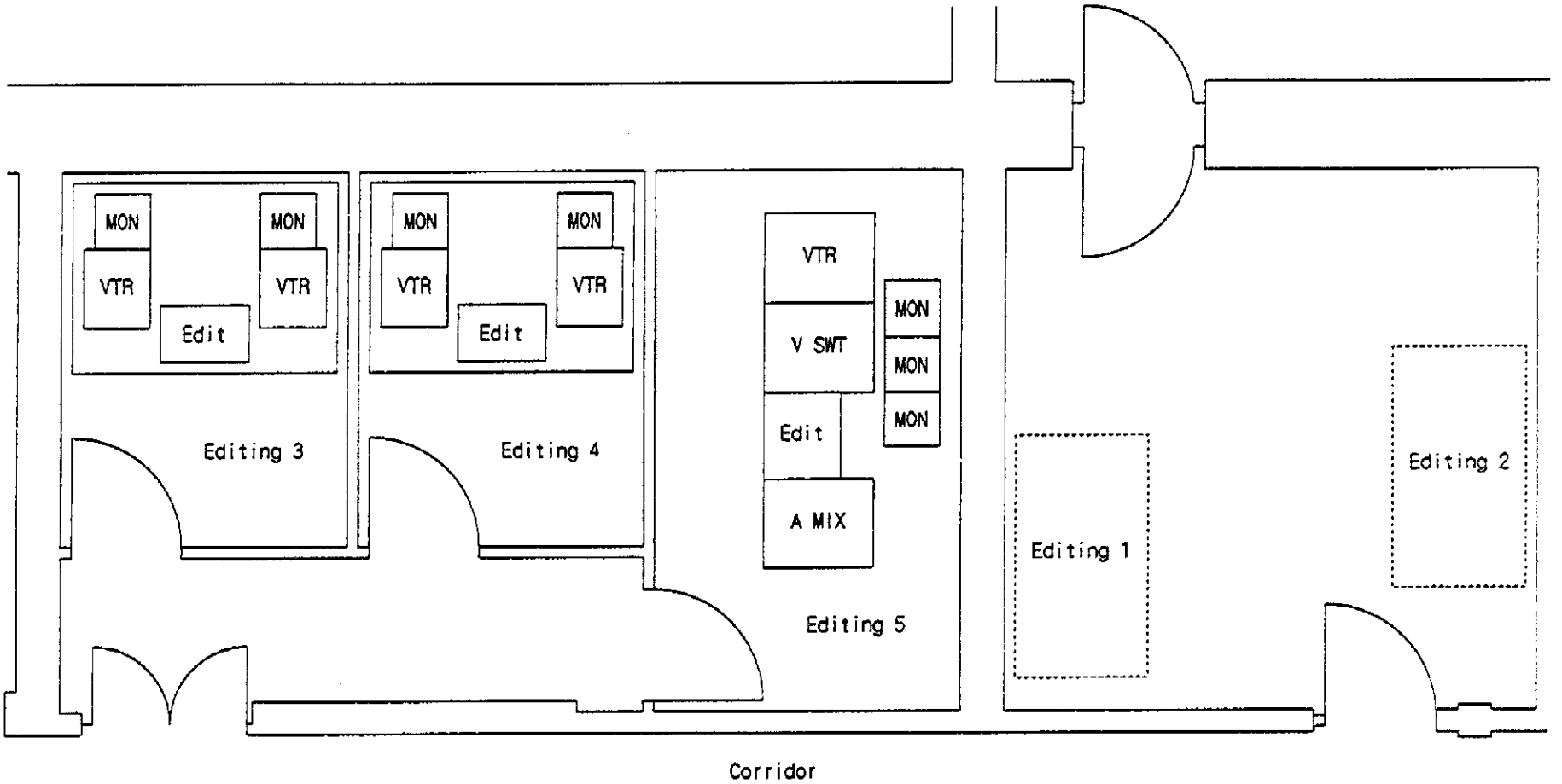


Figure 2-3-12 Equipment Layout of Editing Room

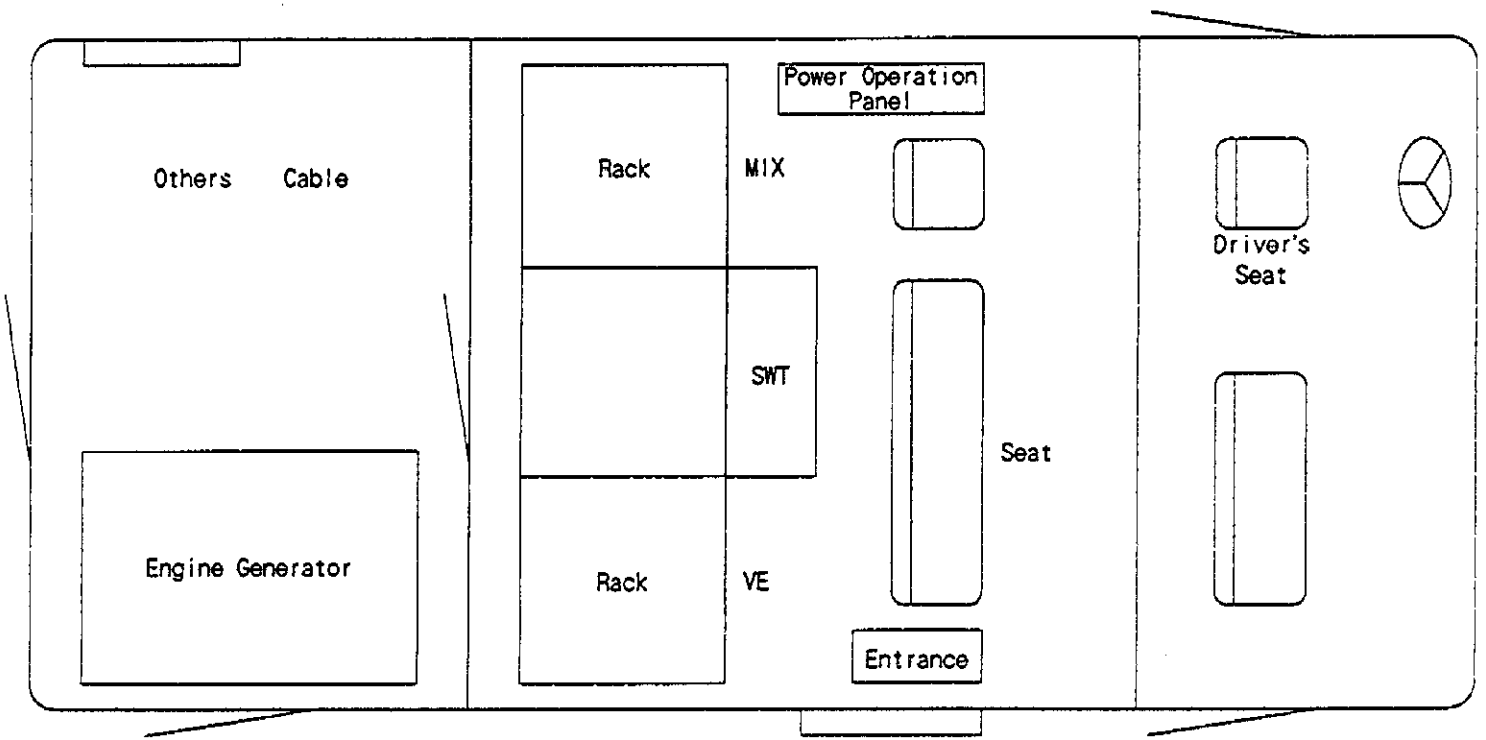


Figure 2-3-13 Equipment Layout of Mini OB Van

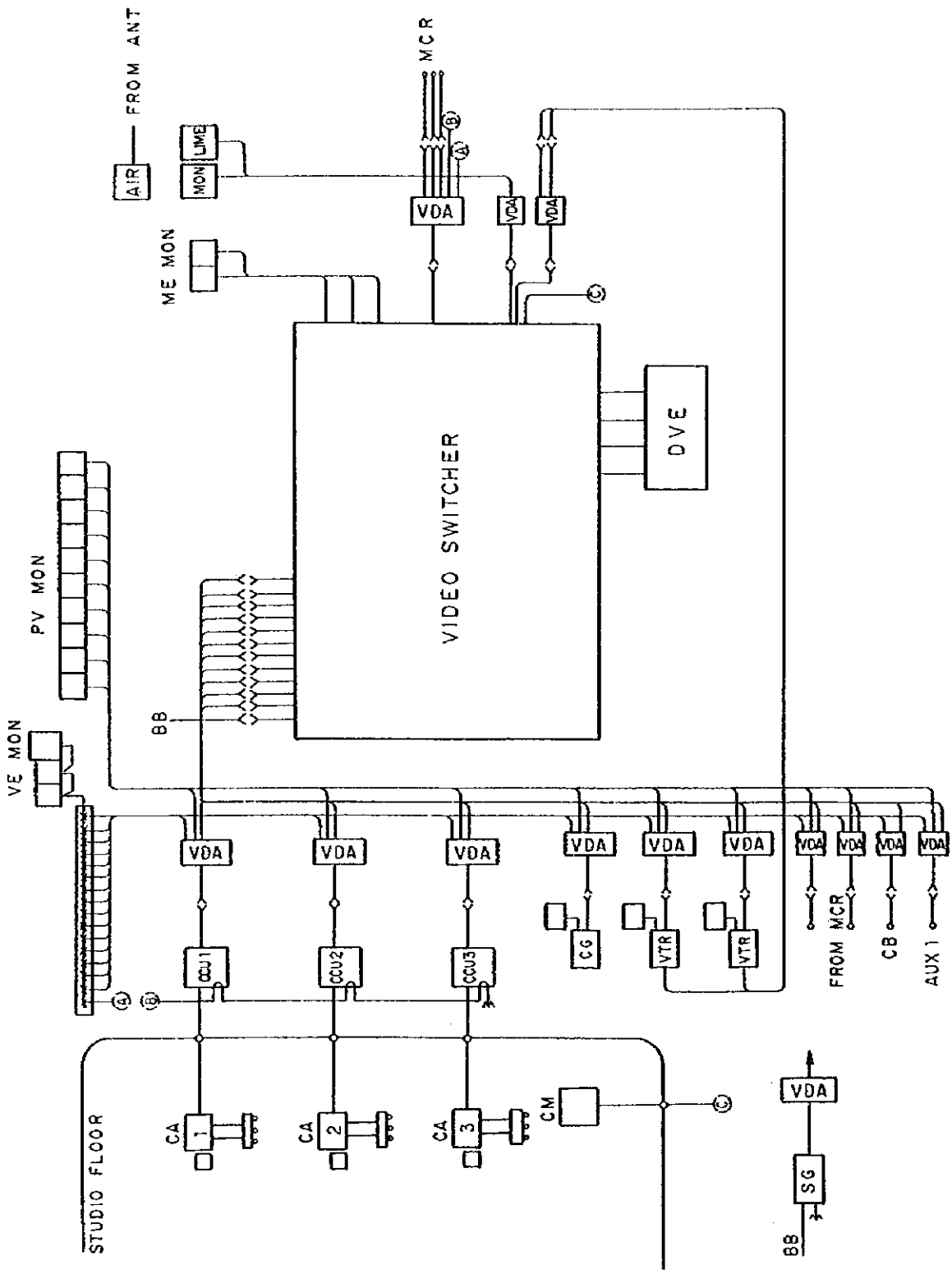


Figure 2-3-14 Schematic Diagram of Studio 1 Video System

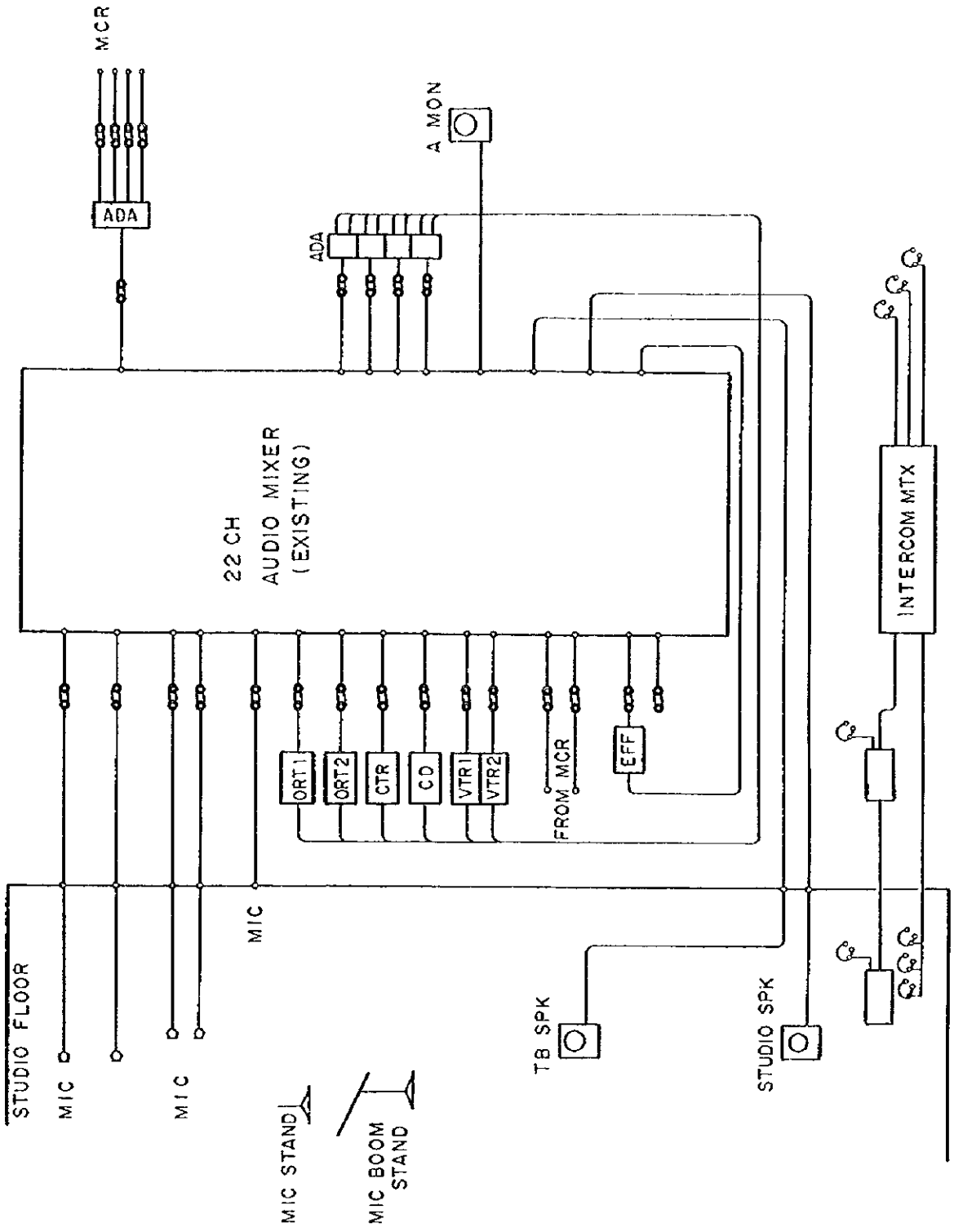


Figure 2-3-15 Schematic Diagram of Studio 1 Audio System

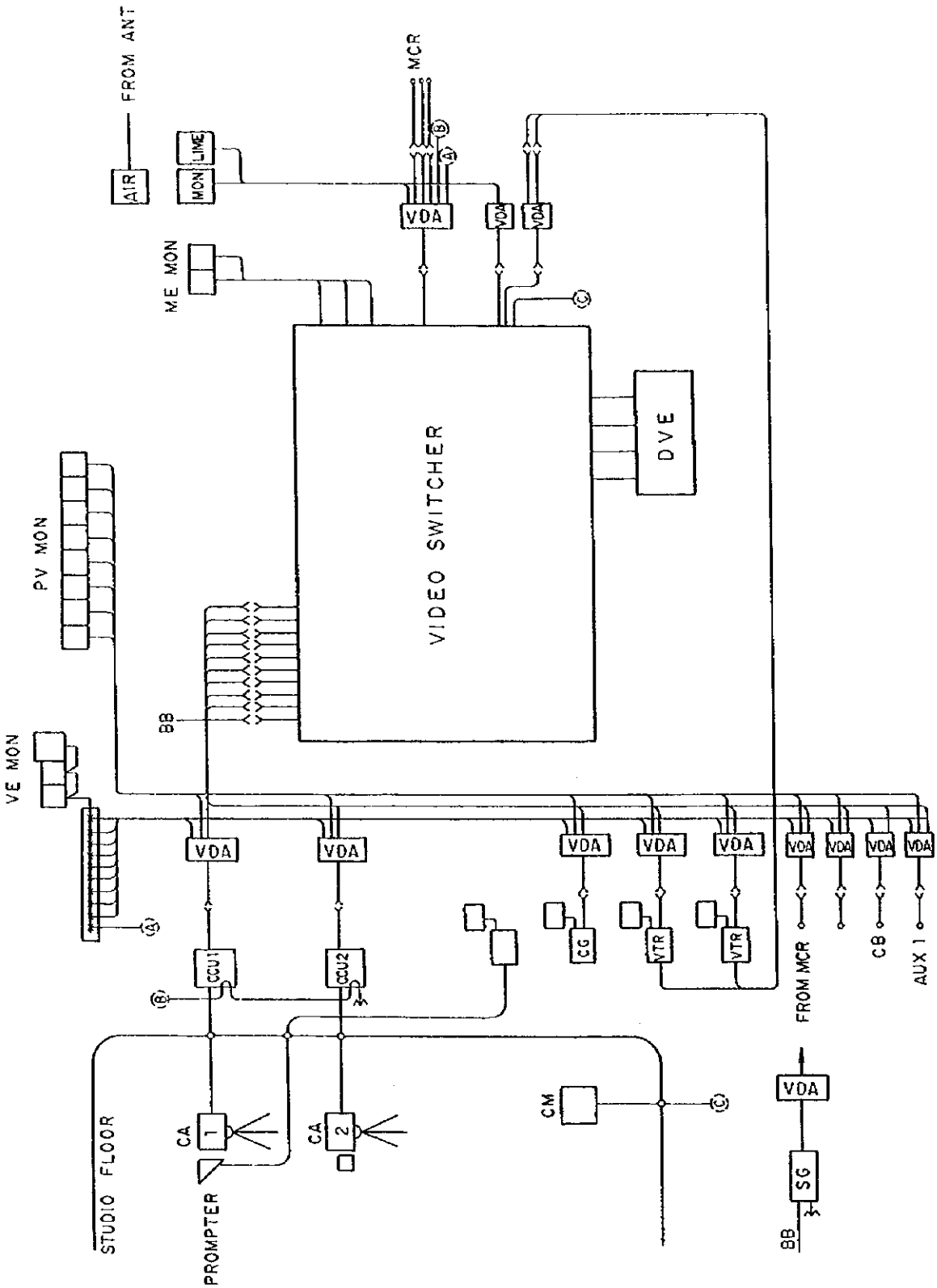


Figure 2-3-16 Schematic Diagram of Studio 3 Video System

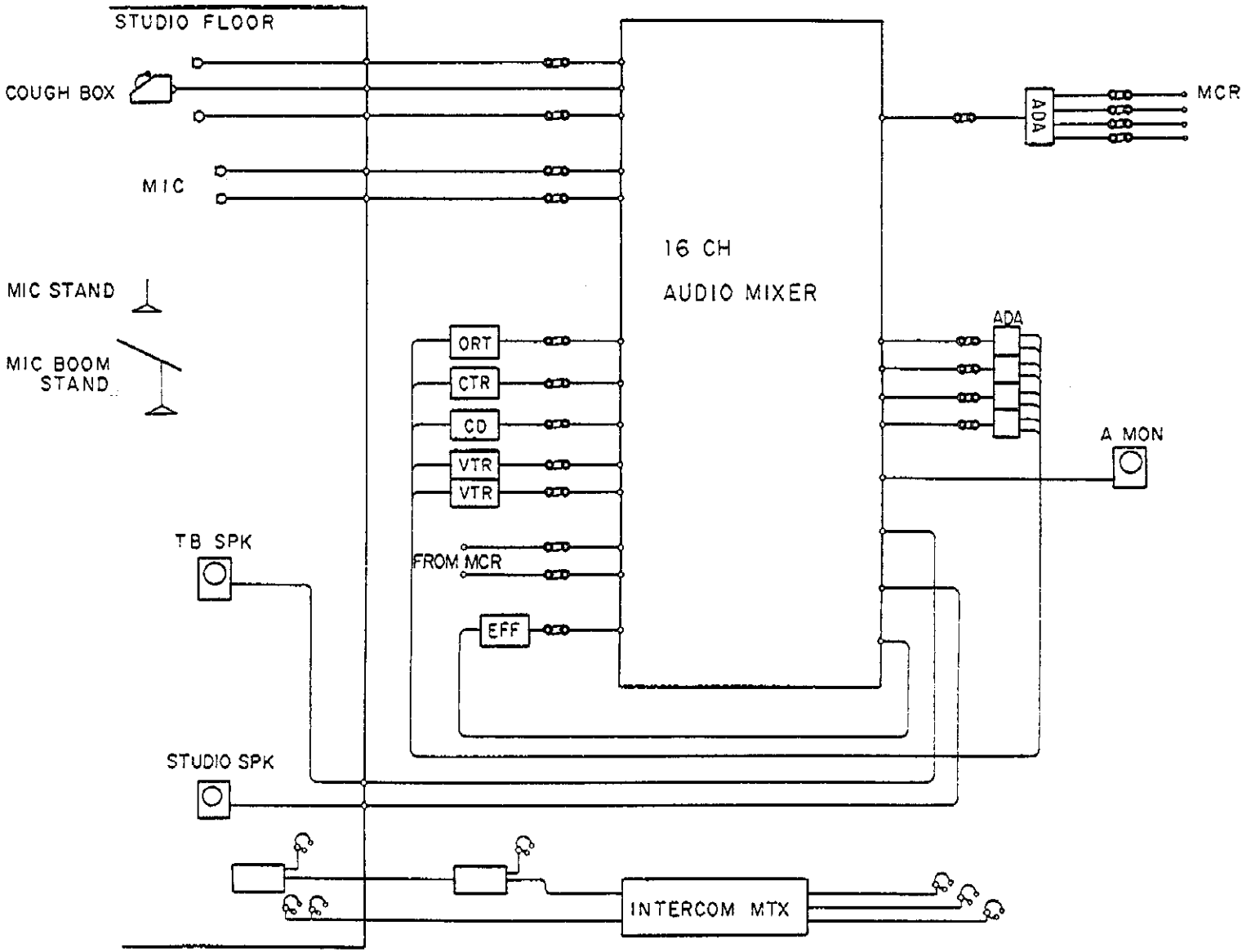


Figure 2-3-17 Schematic Diagram of Studio 3 Audio System

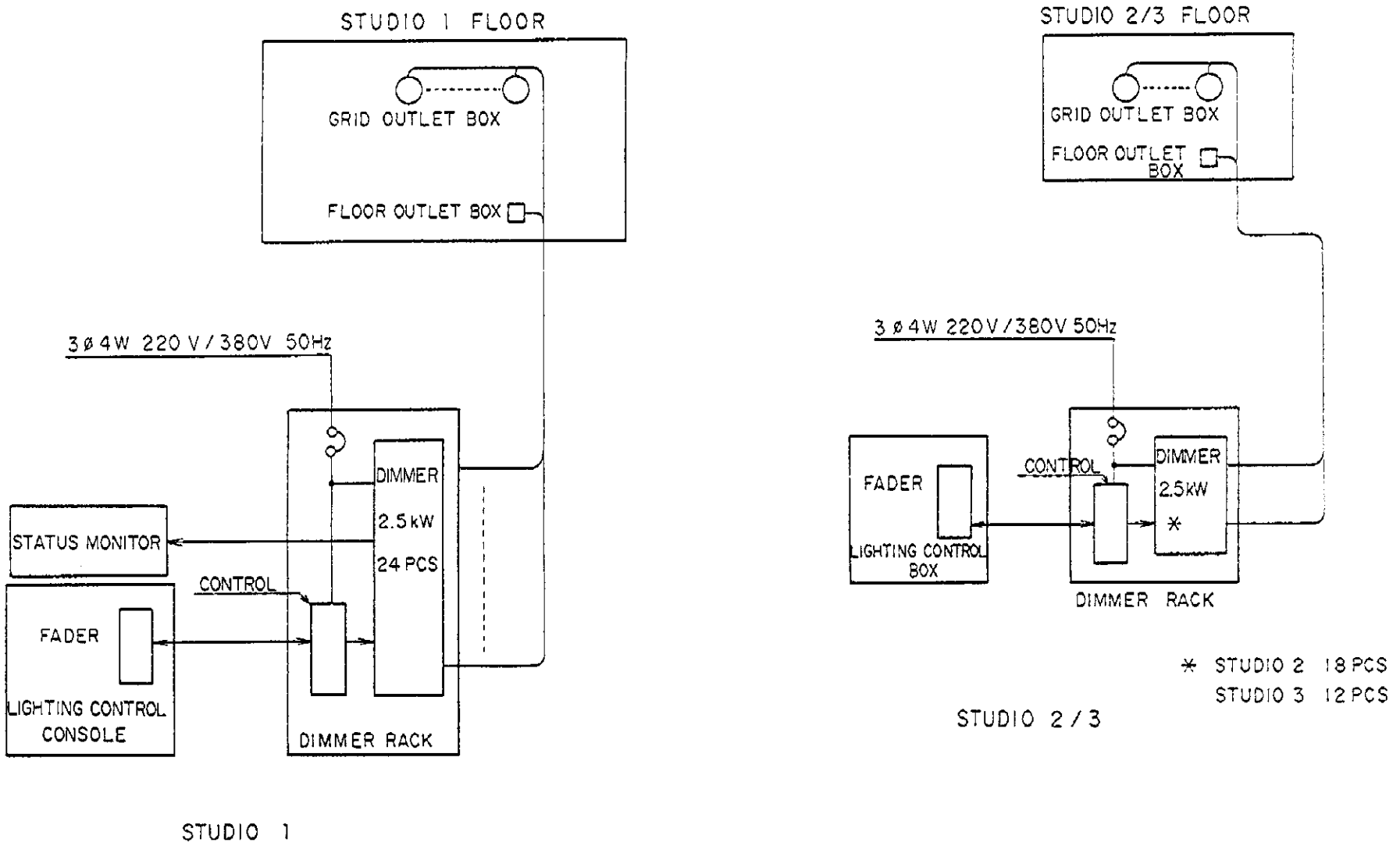


Figure 2-3-18 Schematic Diagram of Lighting System

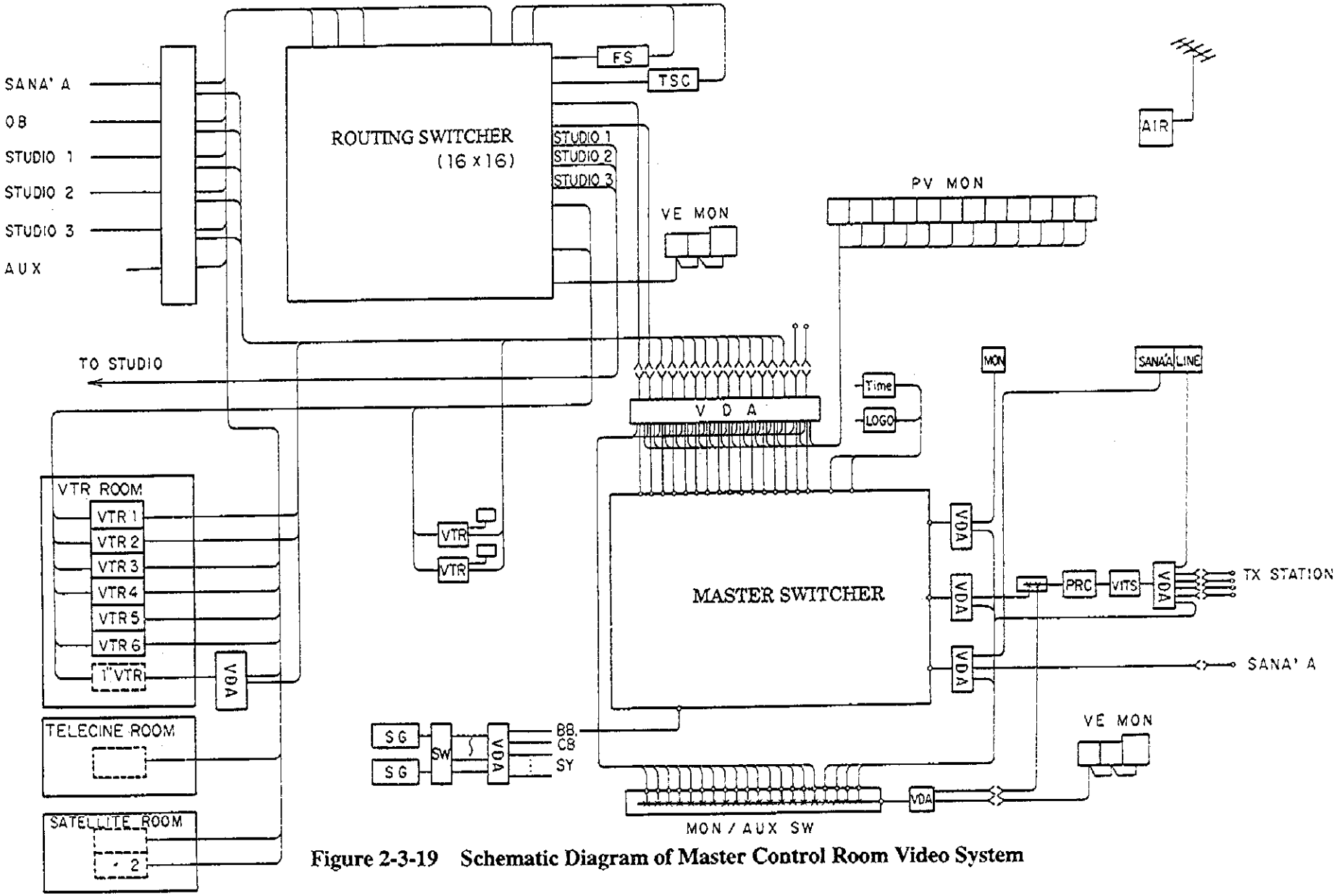


Figure 2-3-19 Schematic Diagram of Master Control Room Video System

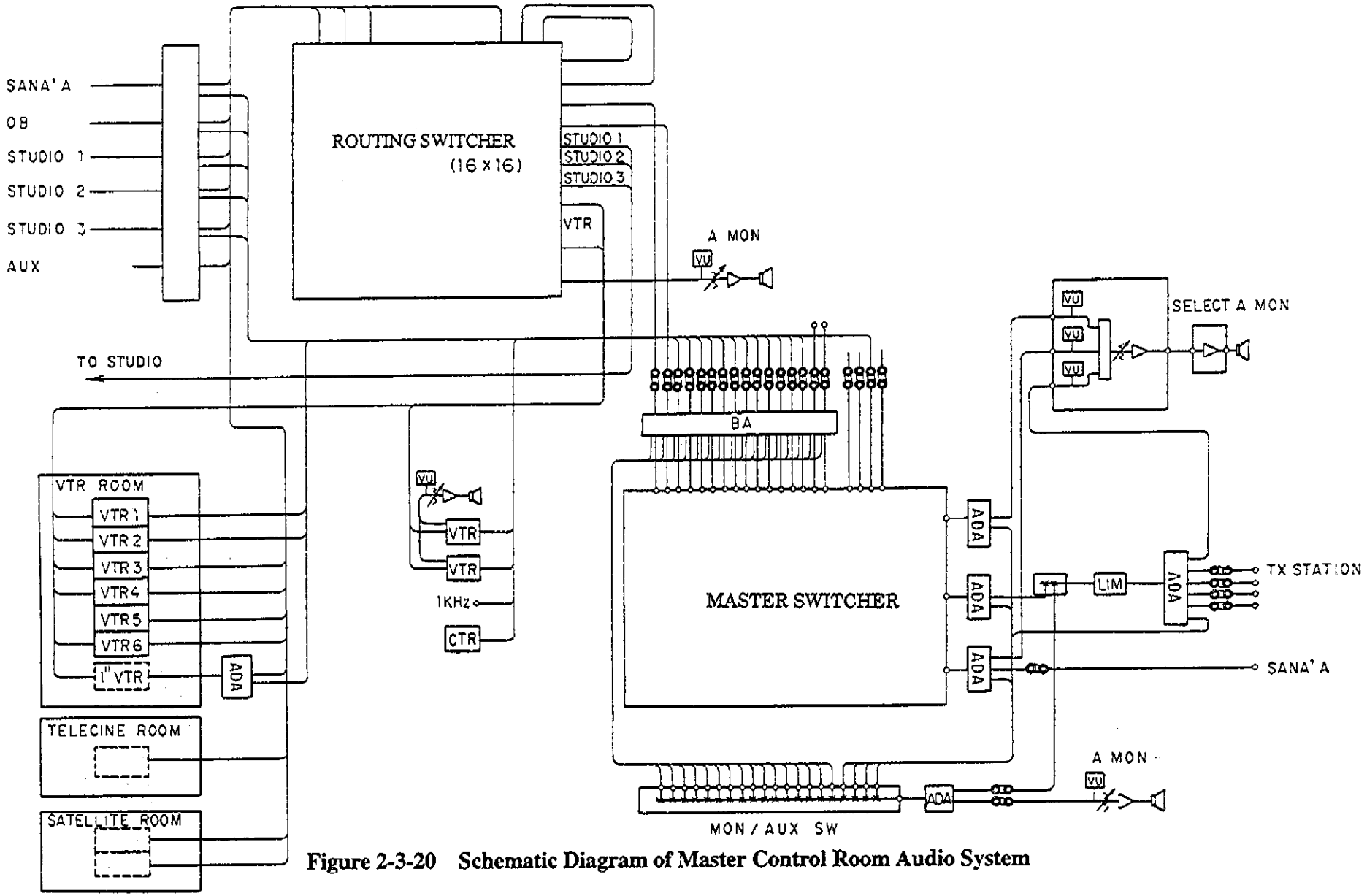


Figure 2-3-20 Schematic Diagram of Master Control Room Audio System

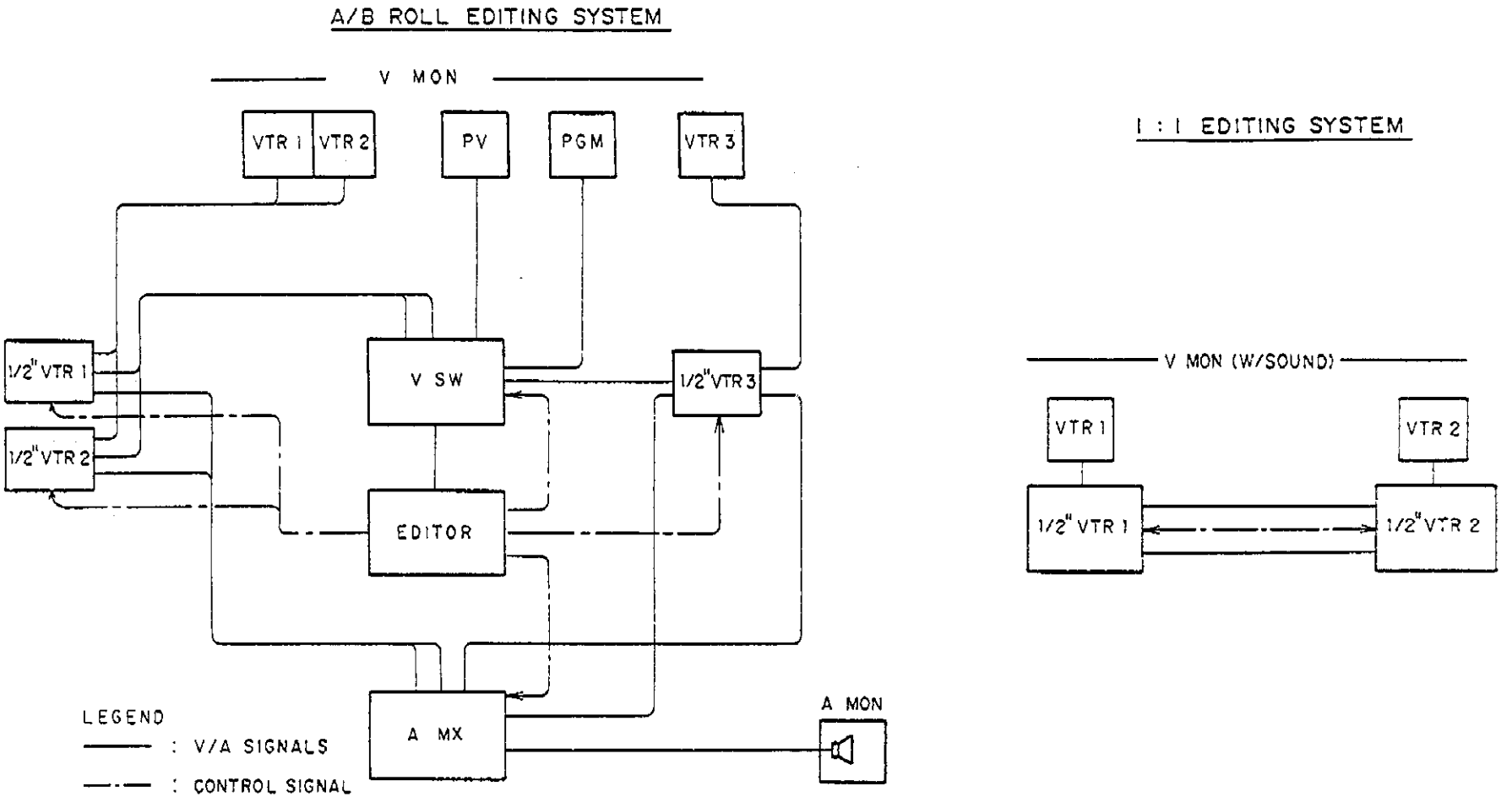


Figure 2-3-21 Schematic Diagram of Editing Room Video and Audio System

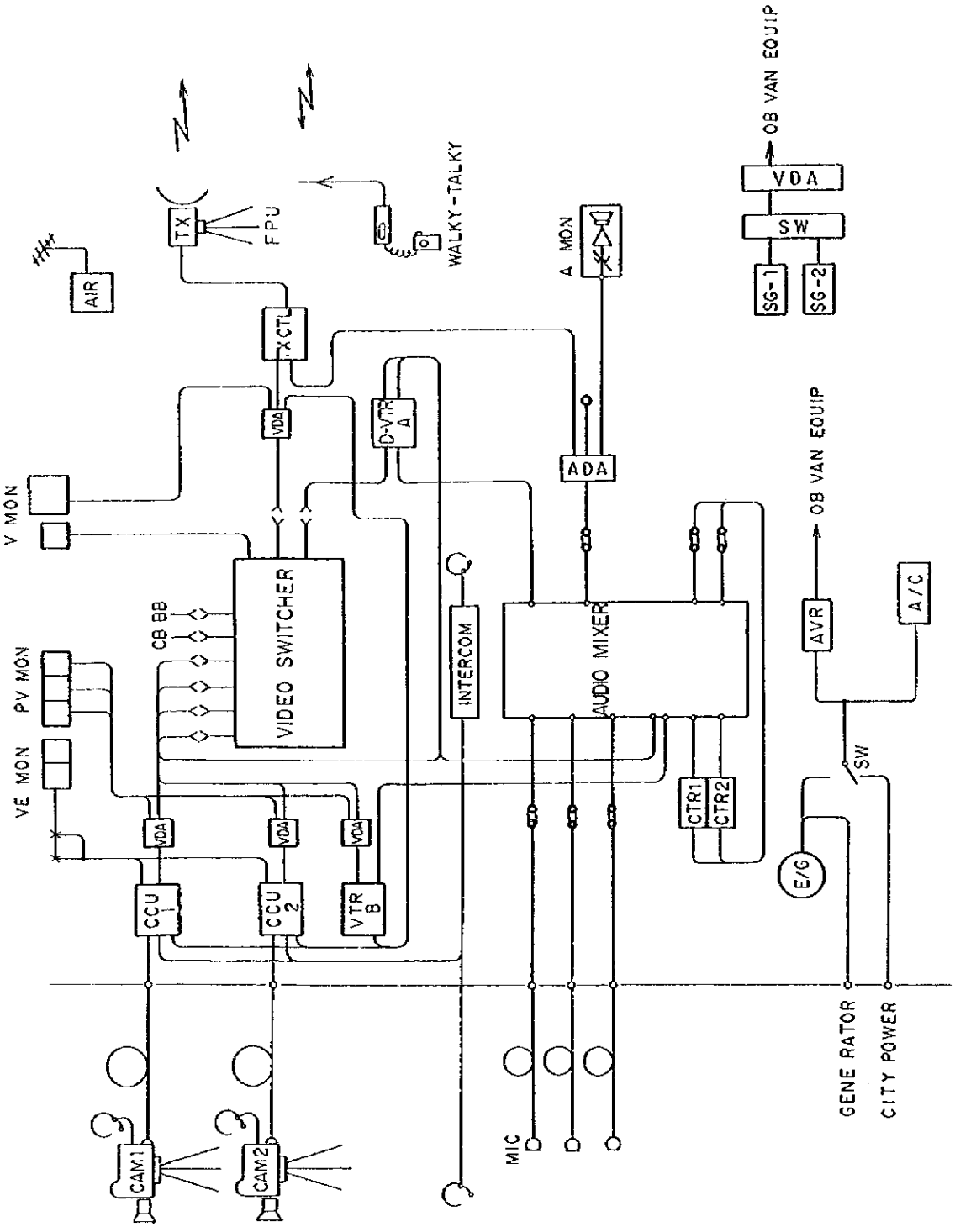


Figure 2-3-22 Schematic Diagram of Mini OB Van Video and Audio System

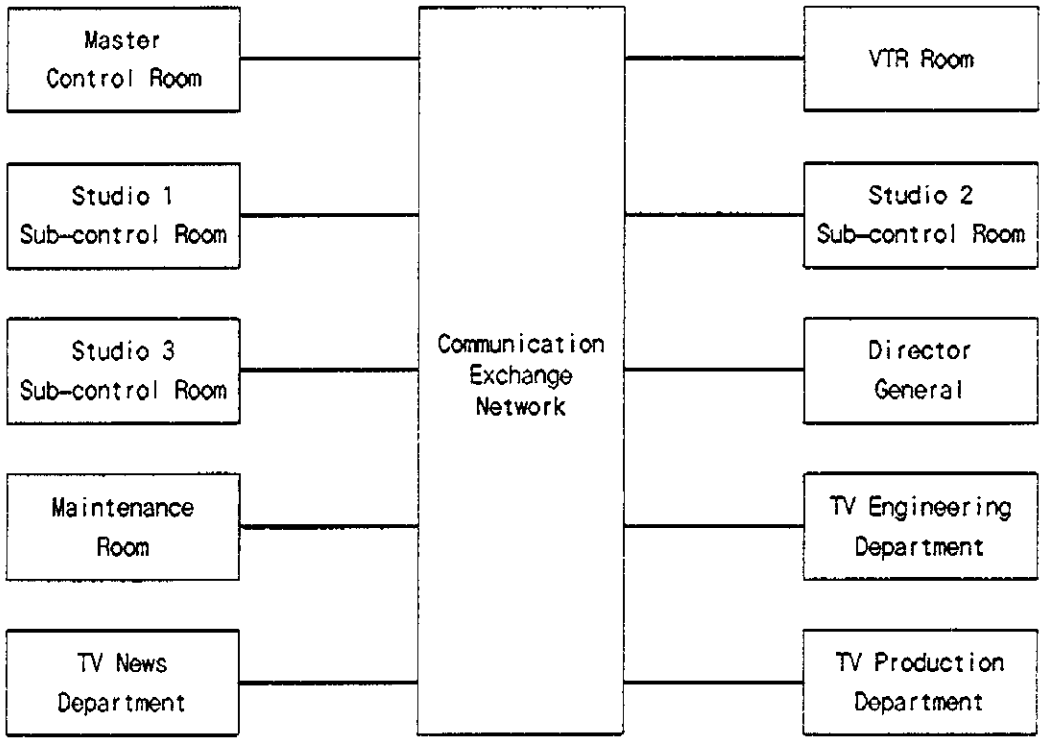


Figure 2-3-23 Schematic Diagram of Room to Room Communication System

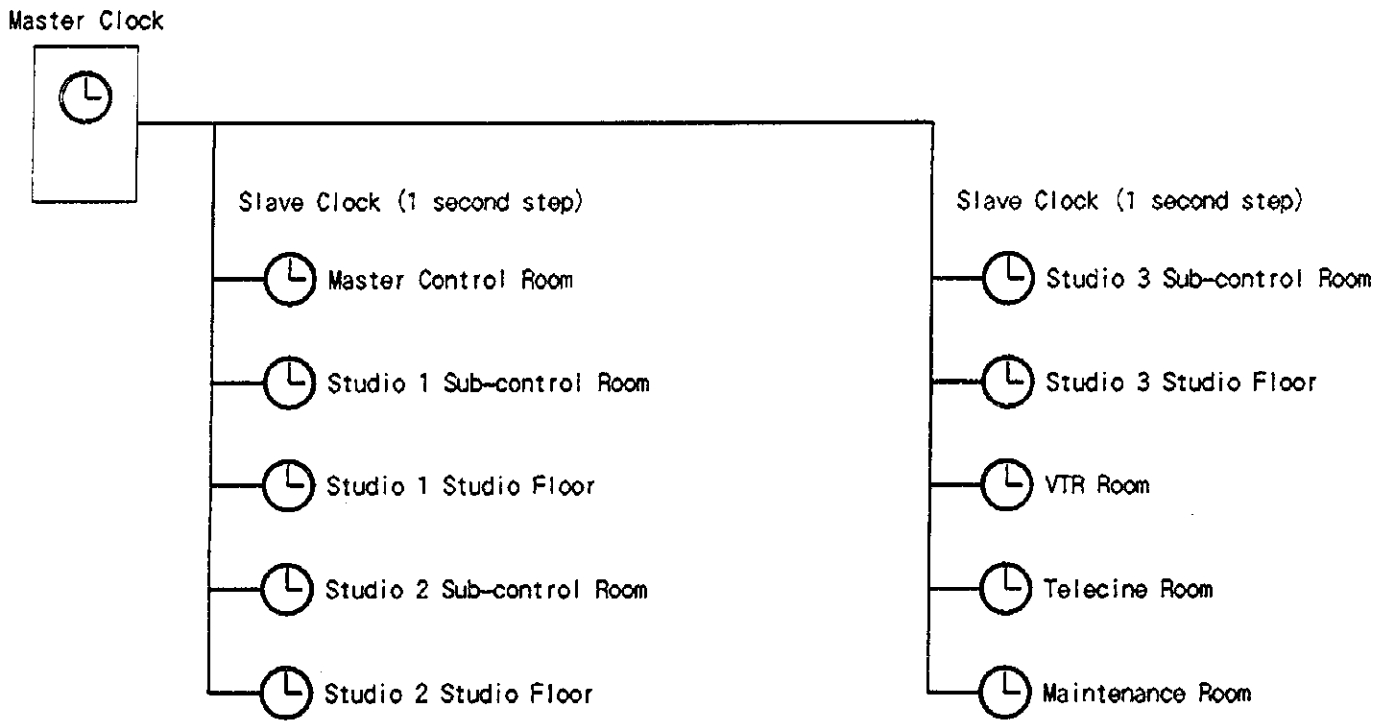


Figure 2-3-24 Schematic Diagram of Clock System

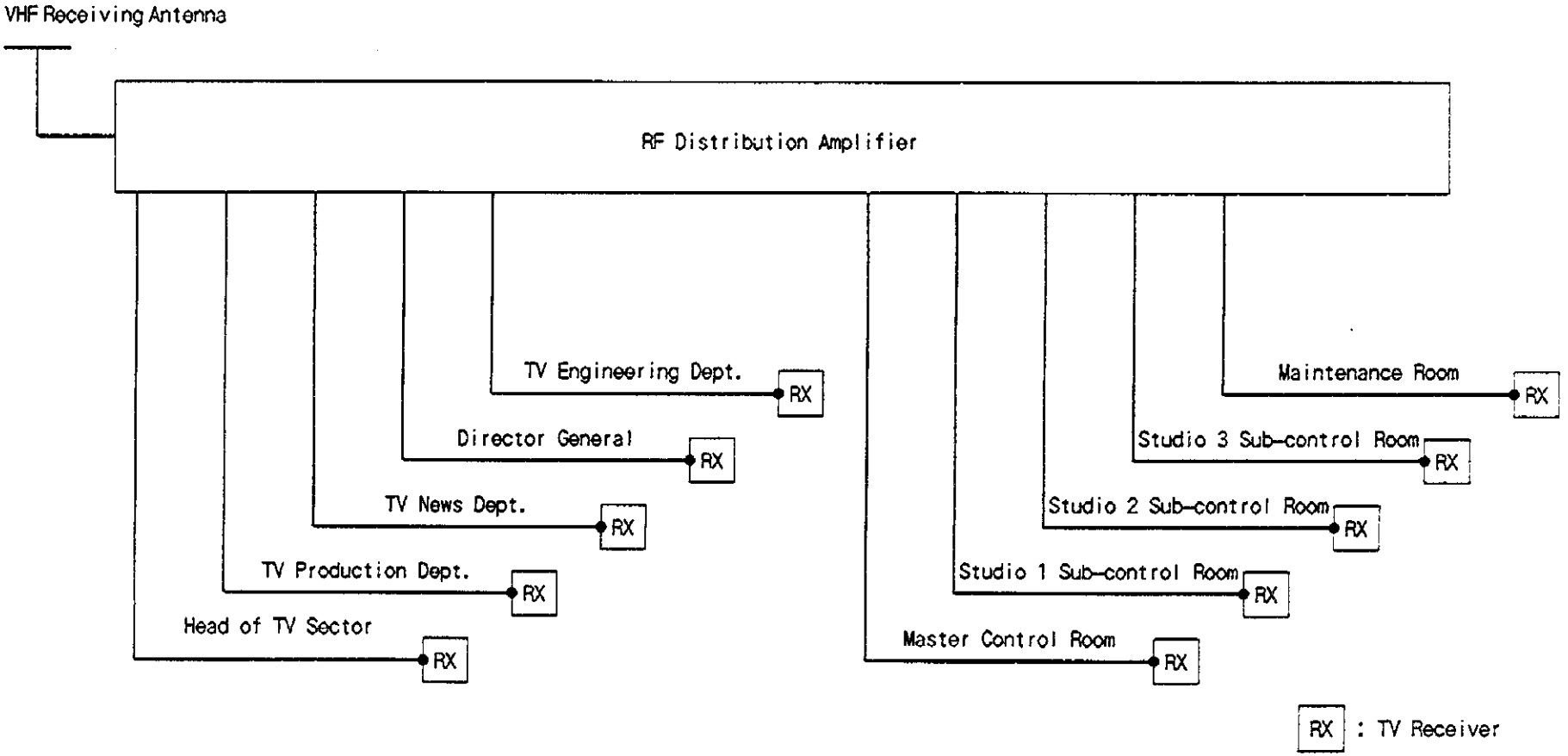


Figure 2-3-25 Schematic Diagram of Community Antenna TV System

Chapter 3.

Implementation Plan

Chapter 3. Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

(1) Project Implementation Setup

1) Related Agencies in Yemen

The agencies concerned with Project implementation on the Yemeni side and their roles are as follows;

a) Ministry of Planning and Development

This is the agency that will decide on the receipt of the grant aid Project.

b) Ministry of Information

This is the superior agency of the General Corporation.

c) The General Corporation for Radio and Television

This is the subject of the Project implementation and will liaise directly with the Japanese consultants and contractors.

2) Project Implementation Procedure

The Project shall commence with the Exchange of Notes (E/N) between the Government of Japan and the Government of Yemen. Following the E/N, the General Corporation (the implementing agency) shall bind a contract with a consultant of Japanese nationality based on the provisions of the E/N, and the consultant shall immediately enter into the detailed design work following approval of the said contract by the Government of Japan.

The procedure for the tender shall begin following completion of the tender documents (equipment design drawings, specifications, etc.).

Based on the provisions of the E/N, the tender shall target only contractors that possess Japanese nationality.

It is foreseen that the equipment will consist of products made by differing manufacturers (studio equipment, lighting equipment, etc.). It is therefore

desirable to target general trading companies that can supply the differing items of equipment in one batch.

A contract for the works shall be concluded between the successful bidder and the General Corporation, but works shall only begin following approval of the said contract by the Government of Japan.

3) Implementation Setup of the General Corporation

In order to ensure the smooth and timely execution of the Project, the General Corporation should appoint the person in charge of Project implementation as quickly as possible. This person in charge shall cooperate with the consultants during the works period to prevent the occurrence of foreseeable problems and make the utmost effort to ensure the smooth progress of the works.

(2) Important Points of the Contractors' Execution Supervision Plan

1) Dispatch of a Permanent Manager

Since works for the installation of Project equipment will take place within facilities of the General Corporation, detailed coordination will be required during execution. For this reason, a System Works Manager shall be dispatched from Japan and permanently stationed on the work site for the whole period of implementation.

2) Dispatch of Specialist Engineers

Engineers possessing special technical knowledge regarding the equipment shall be dispatched to aid the equipment installation works, however, local personnel shall be employed for carrying out simple work that only requires the provision of labor.

3-1-2 Implementation Conditions

(1) Since equipment installation will be carried out while at the same time maintaining current broadcasts, consideration shall be given to the following conditions;

1) Master Control Room Equipment

Master control room equipment used continually during broadcast times shall be installed in a new place separate from the existing master control room. Following

completion of the new equipment installation works, operation shall be switched from the old equipment to the new equipment at a time when the station is off the air.

2) Studio Equipment

The new studio equipment shall be installed in the existing studios. As there are three such studios, installation shall be carried out in one studio at a time.

(2) The implementation of broadcasting during the Project works period shall be the responsibility of the General Corporation.

3-1-3 Scope of Works

The division of works to be carried out by the Government of Japan and the Government of Yemen in the case where the Project is implemented under the grant aid system of Japan is as indicated below.

(1) Scope of Works of the Japan Side

Procurement, transportation and installation of broadcasting equipment for the Aden Station of the General Corporation.

(2) Scope of Works of the Yemen Side

The Yemen side shall carry out the following works relating to the Project.

1) Removal of old equipment

2) Electricity supply works

- Securing of necessary electricity supply capacity
- Installation of power supplies and earth lines for new video and audio equipment
- Installation of power supplies and earth lines for new television lighting equipment

3) Preparation of equipment installation sites

- Preparation of the new master control room and interior renovation of each studio control room and editing room
- Sound insulation improvement of entrance doors

4) Other related works

- Installation and repair of ducts and piping work for wiring between rooms and equipment
- Strengthening of ceiling steelwork for attaching lanterns
- Transfer of air conditioning ducts in studios
- Repair of studio floors

3-1-4 Consultant Supervision

(1) Basic Concept of Supervision

The consultant shall form a project team to carry out the detailed design and implementation supervision based on the purport of the basic design, and shall coordinate opinions with the related agencies and aim for the smooth completion of the Project.

The basic concept of the supervision is described below.

1) The consultant shall coordinate closely with the respective agencies in charge of facilities construction and equipment installation, and shall make the utmost effort to ensure that the works are completed without delay.

2) The consultant shall maintain close communications with the related agencies and officers in both countries, and shall strive to realize the smooth progress of the works by giving appropriate and timely advice to contractors.

3) The consultant shall aim technology transfer with regard to execution methods and technologies, etc. and thus enable the Project to realize its effect as a grant aid concern.

(2) Details of Supervision Work

The work contents of the consultant supervision are described below;

1) Work Relating to Contracts

Preparation of design drawings and tender documents, etc., prequalification of contractors, implementation and evaluation of tender, selection of contractor, preparation of contract agreement, witnessing of the signing of contract, etc.

2) Review of Items Presented by Contractors

Review and approval of shop drawings, working drawings and samples, etc. presented by contractor and manufacturers.

3) Guidance of Works

Examination and guidance to contractor with respect to work plans and time schedule, and periodical reporting to the client on the progress of the works.

4) Cooperation Relating to Procedure for Payment Approval

Review of the contents of bills presented by contractors and cooperation relating to the payment of contract fees to be paid during or at the end of the works.

5) Witnessing of Inspections

Witnessing and approval of tests and inspections performed during the works; implementation of payment procedures; reporting of necessary items to the Government of Japan relating to completion and handing over; verification of the completion of works and witnessing of handing over to the client.

(3) Supervisory Personnel Network

This Project will be carried out within the existing facilities of Aden Station. Accordingly, detailed adjustments will have to be made so as to avoid, as much as possible, interruption of broadcasting or any obstructions to the conduct of broadcasting.

In addition, many connections will have to be made with existing equipment, such as lighting or audio equipment, and the establishment of compatibility among all this

equipment will be extremely important. It is imperative, therefore, that full-time supervisory personnel be dispatched to supervise implementation of the Project, and that other personnel be dispatched for specific objectives in appropriate time periods, such as when works begins or when comprehensive examinations are conducted at the completion of work.

3-1-5 Procurement Plan

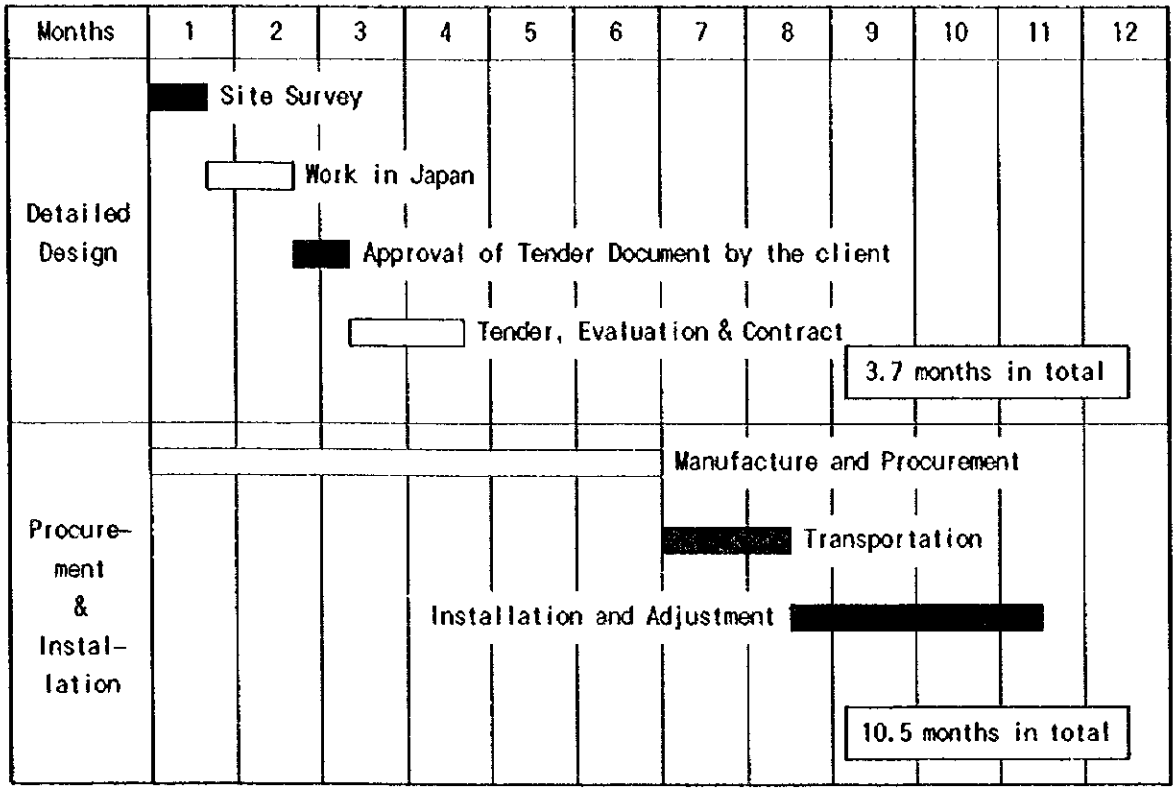
(1) Equipment Procurement Plan

In principle, equipment provided for this Project shall be procured in Japan which was strongly requested from the Yemeni side.

(2) Equipment Transportation Plan

Equipment shall be packed in containers and transported from Japan to Aden in regular marine cargo vessels. Truck shall be used to transport equipment from port to work site, and the time period allowed for transport shall be approximately 45 days.

3-1-6 Implementation Schedule



3-1-7 Obligations of Yemen

1) To carry out the works related to this Project. (refer to 3-1-3 Scope of Works)

2) To acquire all legal authorizations required for the execution of the Project in Yemen.

3) To exempt tariffs and taxes which may otherwise be levied on the imported equipment and materials needed for the works to be borne by the Japan side.

4) To bear the bank charges and commissions required to issue and revise the authorization of payment.

5) To properly operate and maintain the equipment and materials procured under the Grant.

6) To carry out all other works specified as the duties of the recipient within the E/N.

3-2 Operation and Maintenance Plan

(1) Costs

As was mentioned earlier, the financial standing of the General Corporation is not good, however, deficits are supplemented by the Government of Yemen every year.

Within these circumstances, annual program production costs and engineering expenses are increasing, and the same is also true of costs incurred by the OB vans and building facilities.

The Aden Station is planning to expand educational broadcasting following completion of the Project, however, in view of the nature of educational programs, it is difficult to foresee this result in increased income from advertising. Having said that, the Government of Yemen views the Project as an important pillar of national development and has made it a priority project, and it intends to cover any increase in operating expenses following completion.

In the case of the Sana'a Station, in which a project for equipment provision was completed under the grant aid scheme of Japan in the spring of 1996, broadcasting time has been almost doubled and there has been a major increase in the size of the government contribution in line with this. A similar situation can be expected in the case of the Aden Station too.

(2) Operation

The Project basically involves the renewal of deteriorated broadcasting equipment at the Aden Station, and there will be no change in the number of studios following completion.

As for OB van renewal, only one new mini OB van shall be provided to take the place of the existing small OB van that possesses no onboard equipment. Moreover, concerning the increase in outdoor shooting equipment, the existing 20 or so portable type camera staff will have no trouble handling the new equipment.

As for editing systems, since a quantity that matches with the studios, OB vans, outdoor shooting equipment and program recording equipment will be provided, there will again be no problems in terms of personnel.

Consequently, there will be no need to increase staff following Project completion and no problems will arise in terms of operation.

(3) Maintenance

Concerning maintenance staff, there are almost 70 engineering personnel in charge of the control and maintenance of broadcasting equipment and buildings, and there are no problems with respect to the maintenance setup.

Concerning the operation and maintenance cost (including external ordering expenses), 3% of the equipment purchase price is said to be a sound value. Therefore, an annual operation and maintenance budget of around 24,000,000 Rial will basically be required by the Aden Station following Project implementation. Since this equipment is only 2% of total expenditure in the budget of the General Corporation(1996), operation and maintenance is sufficiently feasible in financial terms, too. Furthermore, since the first year after Project completion is a free warranty period and a two-year supply of spare parts will also be provided, it is thought that the operation and maintenance cost during this period will only be around one-quarter the normal cost.