

## 資料－7 フィールドレポート

7. フィールドレポート

**BASIC DESIGN STUDY  
ON**

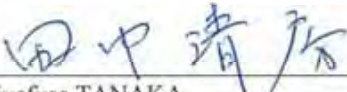
*“le projet de réhabilitation des équipements pour la production de programmes  
du perfectionnement de l'éducation, de la santé et de l'éclaircissement en  
République de Djibouti”*

**FIELD REPORT**

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## 1. Introduction

This Field Report is to establish mutual understandings between JICA Study Team (hereinafter referred to as “the Team”) for “*le projet de réhabilitation des équipements pour la production de programmes du perfectionnement de l’éducation, de la santé et de l’éclaircissement en République de Djibouti*” (hereinafter referred to as “the Project”) and the Djiboutian side (RTD and the other concerned parties) on the technical and engineering aspects for the Project. This has been also prepared by the Team based on the results of the field survey and discussions with the Djiboutian side.

Through the field survey, the Team confirmed the present condition of the existing TV broadcasting facilities in RTD which were constructed in 1991. However, those existing TV broadcasting facilities in RTD have become superannuated and RTD is currently in difficulty to get spare parts for proper operation and maintenance due to their productions ended.

The Project is aimed to archive the following purposes:

- To keep public broadcasting reliably with various information necessary for the nation by replacing those existing TV broadcasting facilities to new facilities
- To improve a capacity of TV program production by replacing those existing analog system to new digital system

Both the Djiboutian and the Japanese sides have recognized to proceed the plans of the equipment component, specifications and undertakings by the both sides under the Project as described in this report.

It is also noted that all the information as described in this report will be decided after further studies in Japan and consultations with JICA and the concerned organizations of the Government of Japan. The Team will submit the draft final report, which describes the final component of the Project, to the Djiboutian side in February 2009 as stated in the Minutes of Discussions (M/D) signed by the both parties on 11th November 2008.

## 2. Present Situation of the Project site

The existing TV building of RTD in Djibouti was constructed by a Japan’s Grant Aid Project in 1991, consisting of one (1) productions studio, one (1) news studio, Master Control Room (MCR) and other editing rooms. In several years after the construction RTD modified some parts of the building and has been continuing renovations by themselves.

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At present, there can be seen some parts where renovations or repairing is required in ceiling, wall, floor, air-conditionings for safe operation of the facilities and protecting from water leakage by rain.

### 3. Equipment Plan

The Team and RTD have agreed to the following contents of the equipment plan (hereinafter referred to as “the Equipment”) as a draft schedule for further studies by the Team in Japan, such as project cost estimation, preparations of the detail equipment specification and the draft final report, etc.

Table 3-1. List of the Planned Equipment Component

No.	Description	Q'ty
1	Production Studio System	1 lot
1.1	Digital Camera System	1 lot
(1)	3-Chip CCD Camera Set (each comprising the followings)	3 sets
1)	3-Chip CCD Camera	1 set
2)	Camera Adaptor	1 set
3)	5-inch B/W View Finder	1 set
4)	Tripod Attachment	1 set
(2)	21x Zoom Lens (with Focus and Zoom Remote)	3 sets
(3)	Camera Control Unit (with Remote Control Panel and Cable)	3 sets
(4)	Pedestal (with Head, Pan Bar, Script Holder)	3 sets
(5)	Camera Cable (each comprising the followings)	3 sets
1)	CCU to Camera CN Plate (Studio)	1 set
2)	Camera CN Plate to Camera	1 set
(6)	Camera CN Plate (for Studio)	1 set
(7)	Test Chart Set (Gain/Resolution with Stand)	1 set
1.2	Digital Recording System	1 lot
(1)	Digital Recorder (REC/PB) (with Rack Mount Kit)	2 sets
(2)	Digital Recorder (PB) (with Rack Mount Kit)	2 sets
(3)	Video Monitor (with Rack Mount Kit)	2 sets
(4)	Audio Monitor Speaker (Rack Mount Type)	1 set
(5)	Remote Control Unit (with Cable)	4 sets
1.3	Digital Video System	1 lot
(1)	Digital Production Switcher	1 set
(2)	Digital Video Effector (2D,3D)	1 set
(3)	Analog to Digital Converter	1 lot

No.	Description	Q'ty
(4)	Digital to Analog Converter	1 lot
(5)	VDA, DDA, VJ, Patch cable	1 lot
(6)	System Rack	1 lot
(7)	Console	1 lot
1.4	Character Generator System	1 lot
(1)	Character Generator	1 set
(2)	17 inch Color Monitor	1 set
(3)	17 inch Multi-scan Display	1 set
(4)	Table	1 set
(5)	Take Switch Panel	1 set
(6)	UPS	1 set
1.5	Digital Audio System	1 lot
(1)	Audio Mixer (with Backup Power Supply)	1 set
(2)	Analog to Digital Converter	1 lot
(3)	Digital to Analog Converter	1 lot
(4)	Compact Disk Player (CD-RW)	2 sets
(5)	Audio Monitor Speaker Panel (Rack Mount Type)	2 sets
(6)	Audio Effector (Delay/Effect)	1 set
(7)	Telephone Hybrid (2ch)	1 set
(8)	Effector Wagon	1 set
(9)	ADA, DDA, AJ, Patch cable	1 lot
(10)	Rack	1 lot
(11)	Operating Table for Mixer	1 lot
1.6	Microphone	1 lot
(1)	Microphone	1 lot
1)	Lavaliere Microphone	4 sets
2)	Dynamic Microphone	4 sets
3)	Condenser Microphone (for Music, Vocal)	8 sets
(2)	Microphone Stand	1 lot
1)	Boom Stand (small)	8 sets
2)	Floor Stand	8 sets
3)	Table Stand	4 sets
(3)	Microphone Cable	1 lot
1)	Mic Cable:20m	10 sets
2)	Mic Cable:10m	10 sets
3)	Mic Cable:5m	10 sets
4)	8 pairs Mic Multi Cable: 25m (with CN Box)	1 set
(4)	Microphone Connector Plate	1 lot

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No.	Description	Q'ty
1.7	Video Sync System	1 lot
(1)	Video Sync Signal Generator	1 set
(2)	Video Sync Signal Distributor	1 set
(3)	Word Sync Signal Generator	1 set
(4)	Word Sync Signal Distributor	1 set
1.8	Monitoring System (A/V)	1 lot
(1)	Video Monitor Selector	1 lot
1)	Video Monitor Switcher Shelf	1 set
2)	Select Panel for VE	1 set
3)	Select Panel for Studio Monitor (Line/PR SET)	1 set
4)	Select Panel for LD	1 set
(2)	17-inch LCD Color Video Monitor	13 sets
(3)	24-inch LCD Color Video Monitor	4 sets
(4)	32-inch Flat-panel Studio Floor Monitor (with Stand)	2 sets
(5)	Digital Waveform Monitor (with Rack Mount Kit)	1 set
(6)	Audio Monitor Speaker/Amp. for Mixer (Stereo, with Stand)	1 set
(7)	Audio Monitor Speaker for VE & DR (Stereo)	1 set
(8)	Audition Monitor Speaker (Stereo)	1 set
(9)	Studio Audio Monitor Speaker/Amp (Stereo with Stand)	1 set
(10)	Studio Talk back Speaker	1 set
(11)	Studio Fold back Speaker/Amp	2 sets
(12)	17-inch Master Video Monitor	1 set
(13)	Air Monitor (SECAM)	1 set
(14)	Monitor Shelf	1 set
(15)	A/V Monitor CN Panel	1 lot
(16)	Stereo Headphone	1 set
1.9	Intercom System	1 lot
(1)	Main Station (with Microphone)	1 set
(2)	CCU Interface	1 set
(3)	Belt Pack	2 sets
(4)	Head Set CN panel with VR (for Ass DR, VE, CG, LD)	4 sets
(5)	Head Set	8 sets
(6)	Earphone for Talent	4 sets
(7)	Studio Talk-back Speaker with Amp.	1 set
(8)	Studio Intercom CN Panel	1 set
1.10	On-Air Light and Tally System	1 lot
(1)	OA Tally Logic	1 set
(2)	OA Tally Light for PM	1 lot

No.	Description	Q'ty
(3)	OA Tally Light for Floor and Entrance	1 lot
1.11	AVR	1 lot
1.12	Lighting Equipment	1 lot
(1)	Fluorescent Light 55Wx4 Lamps	8 sets
(2)	Color Filter Set (Red, Green, Blue: 50each)	1 set
2	News Studio System	1 lot
2.1	Digital Camera System	1 lot
(1)	3-Chip CCD Camera Set (each comprising the followings)	2 sets
1)	3-Chip CCD Camera	1 set
2)	Camera Adaptor	1 set
3)	5-inch B/W View Finder	1 set
4)	Tripod Attachment	1 set
(2)	17x Zoom Lens (with Focus Remote and Zoom Remote)	2 sets
(3)	Camera Control Unit (with Remote Control Panel and Cable)	2 sets
(4)	Pedestal (with Head, Pan Bar and Script Holder)	1 set
(5)	Pedestal (for Prompter Camera with Head, Pan Bar and Script Holder)	1 set
(6)	Prompter System	1 set
1)	Prompter	1 set
2)	Script Camera	1 set
3)	14x Zoom Lenz (with Remote Zoom Control)	1 set
4)	Camera Adapter	1 set
(7)	Camera Cable (each comprising the followings)	2 sets
1)	CCU to Camera CN Plate (Studio)	1 set
2)	Camera CN Plate to Camera	1 set
(8)	Camera CN Plate (for Studio)	1 set
(9)	Test Chart Set (Gain/Resolution with Stand)	1 set
2.2	Digital Recording System	1 lot
(1)	Digital Recorder (REC/PB) (with Rack Mount Kit)	2 sets
(2)	Digital Recorder (PB) (with Rack Mount Kit)	2 sets
(3)	Video Monitor (with Rack Mount Kit)	2 sets
(4)	Audio Monitor Speaker (Rack Mount Type)	1 set
(5)	Remote Control Unit (with Cable)	4 sets
2.3	Digital Video System	1 lot
(1)	Digital Production Switcher	1 set
(2)	Digital Video Effector (2D,3D)	1 set
(3)	Analog to Digital Converter	1 lot
(4)	Digital to Analog Converter	1 lot
(5)	VDA, DDA, VJ, Patch cable	1 lot



No.	Description	Q'ty
(6)	System Rack	1 lot
(7)	Console	1 lot
2.4	Character Generator System	1 lot
(1)	Character Generator	1 set
(2)	17 inch Color Monitor	1 set
(3)	17 inch Multi-scan Display	1 set
(4)	Table	1 set
(5)	Take Switch Panel	1 set
2.5	Digital Audio System	1 lot
(1)	Audio Mixer (with Backup Power Supply)	1 set
(2)	Analog to Digital Converter	1 lot
(3)	Digital to Analog Converter	1 lot
(4)	Compact Disk Player (CD-RW)	1 set
(5)	Audio Monitor Speaker Panel (Rack Mount Type)	1 set
(6)	Audio Effector (Delay/Effect)	1 set
(7)	Telephone Hybrid (2ch)	1 set
(8)	Effector Wagon	1 set
(9)	ADA, DDA, AJ, Patch cable	1 lot
(10)	Rack	1 lot
(11)	Operating Table for Mixer	1 lot
2.6	Microphone	1 lot
(1)	Microphone	1 lot
1)	Lavalier Microphone	4 sets
2)	Dynamic Microphone	4 sets
3)	Condenser Microphone (for Music, Vocal)	3 sets
(2)	Microphone Stand	1 lot
1)	Boom Stand (small)	2 sets
2)	Floor Stand	4 sets
3)	Table Stand	4 sets
(3)	Microphone Cable	1 lot
1)	Mic Cable:10m	10 sets
2)	Mic Cable:5m	10 sets
(4)	Microphone Connector Plate	1 lot
2.7	ANN Cough Equipment	1 lot
2.8	Video Sync System	1 lot
(1)	Video Sync Signal Generator	1 set
(2)	Video Sync Signal Distributor	1 set
(3)	Word Sync Signal Generator	1 set

No.	Description	Q'ty
(4)	Word Sync Signal Distributor	1 set
2.9	Monitoring System (A/V)	1 lot
(1)	Video Monitor Selector	1 lot
1)	Video Monitor Switcher Shelf	1 set
2)	Select Panel for VE	1 set
3)	Select Panel for Studio Monitor (Line PR SET)	1 set
(2)	Video Monitor for News Desk	2 sets
(3)	17-inch LCD Color Video Monitor	14 sets
(4)	24-inch LCD Color Video Monitor	2 sets
(5)	32-inch Flat-panel Studio Floor Monitor (with Stand)	2 sets
(6)	40-inch Plasma or LCD Video Monitor (with Stand)	2 sets
(7)	Digital Waveform Monitor (with Rack Mount Kit)	1 set
(8)	Audio Monitor Speaker/Amp. for Mixer (Stereo, with Stand)	1 set
(9)	Audition Monitor Speaker (Stereo)	1 set
(10)	Studio Audio Monitor Speaker/Amp (Stereo with Stand)	1 set
(11)	Studio Talk back Speaker	1 set
(12)	17-inch Master Video Monitor	1 set
(13)	Monitor Shelf	1 set
(14)	A/V Monitor CN Panel	1 lot
(15)	Stereo Headphone	1 set
2.10	Intercom System	1 lot
(1)	Main Station (with Microphone)	1 set
(2)	CCU Interface	1 set
(3)	Belt Pack	2 sets
(4)	Head Set CN panel with VR (for Ass DR, VE, CG,)	3 sets
(5)	Head Set	8 sets
(6)	Earphone for Talent	4 sets
(7)	Studio Talk-back Speaker with Amp.	1 set
(8)	Studio Intercom CN Panel	1 set
2.11	On-Air Light and Tally System	1 lot
(1)	OA Tally Logic	1 set
(2)	OA Tally Light for PM	1 lot
(3)	OA Tally Light for Floor and Entrance	1 lot
2.12	UPS	1 lot
3	Master Control System	1 lot
3.1	Digital Video Equipment	1 lot
(1)	Digital Master Switcher	1 set
(2)	Analog to Digital Converter	1 lot

No.	Description	Q'ty
(3)	Digital to Analog Converter	1 lot
(4)	VDA, DDA, VJ, Patch cable	1 lot
(5)	Format Converter (PAL to SECAM)	2 sets
(6)	Rack	1 lot
(7)	Master Console	1 set
3.2	Digital Recording System	1 lot
(1)	Digital Recorder (REC/PB) (with Rack Mount Kit)	2 sets
(2)	Video Monitor (with Rack Mount Kit)	2 sets
(3)	Audio Monitor Speaker (Rack Mount Type)	2 sets
(4)	Remote Control Unit (with Cable)	2 sets
(5)	HDD/DVD Recorder	2 sets
3.3	Logo Generator/Insertor	1 lot
(1)	Logo Generator	2 sets
(2)	Insertor	4 sets
(3)	Time Generator	1 set
3.4	Test Signal Generator	1 set
3.5	Flame Synchronizer (with Remote Control Unit)	6 sets
3.6	Digital Audio Equipment	1 lot
(1)	Digital Master Switcher	1 lot
1)	Digital Master Switcher	1 set
2)	Digital Monitor Switcher	1 set
(2)	Test Signal Generator	1 set
(3)	Automatic Gain Controller (AGC)	4 sets
(4)	Analog to Digital Converter	1 lot
(5)	Digital to Analog Converter	1 lot
(6)	ADA, DDA, AJ, Patch cable	1 lot
(7)	Stereo to Mono. Converter	1 set
(8)	Rack	1 lot
3.7	Sync Signal System	1 lot
(1)	Sync Signal Generator	2 sets
(2)	Auto Change-over Unit	1 set
(3)	Pulse Distribution Amplifier	1 set
(4)	Audio Sync. System	2 set
3.8	Monitor System (A/V)	1 lot
(1)	17-inch LCD Video Monitor	16 sets
(2)	Digital Waveform Monitor (with Rack Mount kit)	1 set
(3)	17-inch Master Video Monitor	1 set
(4)	Air Monitor (SECAM)	1 set

No.	Description	Q'ty
(5)	Audio Monitor	1 set
(6)	Stereo Scope	1 set
(7)	VU Meter Panel	1 set
(8)	Monitor Shelf	1 set
3.9	Room to Room Intercom System	1 lot
(1)	Main Frame (Matrix)	1 set
(2)	Terminal Station	5 sets
3.10	Master Clock	1 set
3.11	OA Tally System	1 lot
(1)	OA Tally Logic	1 set
(2)	OA Tally Light for PM	1 lot
3.12	UPS	1 lot
4	Format Conversion System	1 lot
4.1	Digital Recording System	1 lot
(1)	Digital Recorder (REC/PB) (with Rack Mount Kit)	3 sets
(2)	Video Monitor (with Rack Mount Kit)	2 sets
(3)	Audio Monitor Speaker (Rack Mount Type)	2 sets
4.2	Digital Video/Audio System	1 lot
(1)	Time Base Corrector	2 sets
(2)	VJ, AJ, Patch cable	1 lot
(3)	Rack	1 lot
4.3	Sync Signal Generator (Video/Audio)	1 set
4.4	AVR	1 lot
5	Field Recording (ENG) System (each comprising the followings)	5 lots
5.1	Camera Equipment	1 lot
(1)	Digital Portable Camcorder	1 set
1)	3CCD Portable Camcorder	1 set
2)	Tripod Attachment	1 set
3)	Gun Microphone	1 set
4)	Microphone Cable	1 set
(2)	21x Zoom Lens (with x2 Extender)	1 set
(3)	UV Filter	1 set
(4)	Re-chargeable Battery Pack	5 sets
(5)	Battery Charger	1 set
(6)	AC Adaptor	1 set
(7)	DC Power Cable	1 set
(8)	Tripod/Head/Dolly (with portable case)	1 set
(9)	Camera Head Carrying Case	1 set

No.	Description	Q'ty
(10)	Rain Jacket	1 set
(11)	Field Cover	1 set
(12)	Lens Cleaning Set	1 set
5.2	Audio System	1 lot
(1)	Dynamic Microphone	1 set
(2)	Lavalier Microphone	1 set
(3)	Gun Microphone (with Carrying Case, Hand Grip and Wind-shield)	1 set
(4)	Fish Pole with Adaptor	1 set
(5)	Connecting Cable	1 lot
1)	Mic Cable: 10m	2 sets
2)	Mic Cable: 5m	2 sets
3)	Mic Cable: 3m	1 set
4)	Mic Cable: 1.5m	1 set
(6)	Portable Compact Mixer	1 set
1)	Portable Compact Mixer	1 set
2)	AC Adapter	1 set
3)	Battery Case	1 set
4)	Re-chargeable Battery Pack	5 sets
5)	Battery Charger	1 set
5.3	Monitoring System	1 lot
(1)	Portable Video Monitor	1 lot
1)	9-inch LCD Color Video Monitor	1 set
2)	ENG Kit	1 set
3)	Re-chargeable Battery Pack	5 sets
4)	Battery Charger	1 set
5)	Video Monitor Cable	1 set
(2)	Stereo Headphone	1 set
5.4	Lighting System	1 lot
(1)	Battery Lighting Set (with 5pcs Lamps)	1 set
(2)	Cam-light Set (with 5pcs Lamps)	1 set
6	Portable Light Set for ENG (with AC Cable/Reel)	2 sets
7	Wireless Microphone for ENG (each comprising the followings)	2 sets
(1)	UHF Synthesized Transmitter (with Lavalier Mic.)	1 set
(2)	UHF Synthesized Tuner (Camera Mount Type)	1 set
8	Video Non-Linear Editing System (each comprising the followings)	4 lots
8.1	Video Editing System	1 lot
(1)	Non-Linear Editing System	1 set

No.	Description	Q'ty
1)	CPU System (with DVD/RW and CD/RW)	1 set
2)	LCD Monitor for CPU	2 sets
3)	Non-Linear Software	1 set
(2)	Digital Recorder (REC/PB)	1 set
8.2	Audio System	1 lot
(1)	Audio Mixer with Line Converter	1 set
(2)	Compact Disc Player (CD-RW)	1 set
8.3	Monitoring System (A/V)	1 lot
(1)	17-inch LCD Color Video Monitor	1 set
(2)	Monitor Speaker (Stereo Speaker with Amp.)	1 set
(3)	Stereo Headphone	1 set
(4)	Headphone Amplifier	1 set
8.4	Editing Desk with Side Rack	1 set
8.5	UPS	1 lot
9	Announce Booth Equipment for Non-Linear Editing System (each comprising the followings)	2 lots
(1)	17-inch LCD Color Video Monitor	1 set
(2)	Dynamic Microphone with Table Stand	1 set
(3)	Stereo Headphone	1 set
10	1 : 1 Editing System (each comprising the followings)	3 lots
(1)	Digital Recorder (REC/PB)	1 set
(2)	Digital Recorder (PB)	1 set
(3)	Editing Controller (with Control cable)	1 set
(4)	17-inch Video Monitor	2 sets
(5)	Monitor Speaker (Stereo Speaker with Amp.)	1 set
(6)	Operating Table	1 set
(7)	Rack	1 set
(8)	AVR	1 set
11	Maintenance Equipment and Tools	1 lot
(1)	Digital Oscilloscope (500MHz)	1 set
(2)	Multi Format Digital Waveform Monitor	1 set
(3)	Video Test Signal Generator	1 set
(4)	Analog Audio Analyzer	1 set
(5)	Tool Kit	1 set
12	Consumable Parts	1 lot
(1)	Recording Media (for 1,000 hours)	1 lot
(2)	CD-RW	100 pcs

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No.	Description	Q'ty
(3)	DVD-RW	400 pcs

#### 4. Basic Design Concept

In order to plan and design the equipment component of the Project, the following technical requirements shall be considered.

##### 4-1 Applicable Design Standards

Table 4-1-1. Applicable Design Standards

	Name of Standards	Application
(a)	International Electrotechnical Commission (IEC)	Main functions of electrical goods in general
(b)	International Standardization Organization (ISO)	Performance of industrial products in general
(c)	Japanese Industrial Standards (JIS)	Industrial products in general
(d)	Japanese Electrotechnical Commission (JEC)	Electrical goods in general
(e)	The Standard of Japan Electrical Manufacturer's Association (JEM)	Same as above
(f)	Japan Electric Association Code (JEAC)	Same as above
(g)	Japan Cable Maker's Association Standard (JCS)	Electrical wires and cable
(h)	Electrical Industrial Association of Japan (EIAJ)	Electrical goods in general
(i)	International Telecommunication Union (ITU)	Electrical goods in general
(j)	Society of Motion Picture and Television Engineers (SMPTE)	Broadcasting equipment in general
(k)	Other related Japanese and International standards such as AES/EBU (Audio Engineering Society/ European Broadcast Union)	Industrial products in general

##### 4-2 Key Specifications of the Equipment

###### 4-2-1. Production Studio System

###### (1) Outline

This system aims to digitalize the current analog base system. The system adopts three (3) units of studio camera and its signal interface format between the equipments shall be the uncompressed serial digital signal supported by ITU-R.

The audio system shall also be digital system supported by AES/EBU format. The sampling rate of the audio signal shall be 48kHz.

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(2) Key Specifications

1) Digital Camera System:

The studio camera shall be 3-chips CCD and portable type for the studio use. The aspect ratio of CCD shall be 16:9 / 4:3 switchable, S/N ratio shall be more than 63db (PAL) and 21 times (or more) zoom lens shall be equipped.

2) Digital Recording System:

The recording media of the digital recorder shall be optical disc or semiconductor memory card type.

The digital recorder shall be equipped with the RS-422 control interface and video signal process shall be 4:2:2. Its output signal shall be serial digital signal supported by ITU-R.

3) Digital Production Switcher / Effector:

The digital video switcher shall have SDI interfaces for In/Out terminals and 16 (or more) primary inputs including a video effect generator with down stream and 3 dimensional special video effects function.

4) Digital Audio System:

The audio mixer shall have 24 input (or more) faders with backup DC power supply for emergency use. The sampling rate shall be 48kHz. The slide fader shall be conductive plastic type.

4-2-2. News Studio System

(1) Outline

This system aims to digitalize the current analog base system. This studio shall have a back up function of the master program transmission in addition to news program production.

The system adopts two (2) units of studio camera and its signal interface format between the equipment shall be the uncompressed serial digital signal supported by ITU-R. One of two cameras shall have a prompter equipment.

The audio system shall be digital system supported by AES/EBU format. The sampling rate of the audio signal shall be 48kHz.



(2) Key Specifications

1) Digital Camera System:

The studio camera shall be 3-chips CCD and portable type for the studio use. The aspect ratio of CCD shall be 16:9 / 4:3 switchable, S/N ratio shall be more than 63db (PAL) and 17 times (or more) zoom lens shall be equipped.

2) Digital Recording System:

The record media of the digital recorder shall be optical disc or semiconductor memory card type.

The digital recorder shall be equipped with the RS-422 control interface and video signal process shall be 4:2:2. Its output signal shall be serial digital signal supported by ITU-R.

3) Digital Production Switcher/Effecter:

The digital video switcher shall have SDI interfaces for In/Out terminals and 16 (or more) primary inputs including a video effect generator with down stream and 3 dimensional special video effects function.

4) Digital Audio System:

The audio mixer shall have 24 input (or more) faders with backup DC power supply for emergency use. The sampling rate shall be 48KHz. The slide fader shall be conductive plastic type.

4-2-3. Master Control System

(1) Outline

This system shall consist of Master Matrix, Logo Generator, Digital Recorder, Room to Room Intercom System, Master Clock, etc., under the manual controlled system. Master Control System manages the entire program send-out process through master switcher. Programs from the studios, Digital Recorder, outside signal coming from OB VAN (FPU), etc., shall be selectively send out to the TV Transmitter, CS earth station and Earth station (Foreign countries). The system shall process a function of four (4) separate program transmission.

(2) Key Specifications

1) Digital Master Switcher:

All the input terminals of the master video matrix shall have SDI interface for In/Out

terminals. In combination with inserter, the master matrix shall have a superimposing function through signals from the Logo Generator.

The audio system shall be digital system supported by AES/EBU format. The sampling rate of the audio signal shall be 48kHz,

2) Digital Recording System:

The record media of the digital recorder shall be optical disc or semiconductor memory card type.

The digital recorder shall be equipped with the RS-422 control interface and video signal process shall be 4:2:2. Its output signal shall be serial digital signal supported by ITU-R.

3) Logo Generator/Inserter:

Logo generator shall be used to generate the RTD's Station Logo and shall have memory chips which can store up to 10 logos.

Logo position can be changed by control switches/buttons on the front panel.

4) Room to Room Intercom System:

Intercom System shall be provided to communicate between master control room and other rooms with maximum 20 (or more) terminals and high quality audio.

5) Master Clock:

Master clock shall be proofread between the standard time with the clock signal of GPS and shall enable to utilize the existing slave clocks in the RTD's TV building.

4-2-4. Format Conversion System

(1) Outline

The system shall adopt Patch bay which handles Video and Audio signals and shall enable to connect the RTD's existing VTRs such as U-matic (3/4-inch VTR), Beta cam SP VTR, DVC Pro VTR for player of the huge number of past invaluable video materials. Three (3) units of Digital Recorder shall be connected to the system for Play back/Recording.

(2) Key Specifications

1) Patch bay:

The patch bay shall have Analog Composite Video signal and Analog Audio interface.

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2) Digital Recording System:

The record media of the digital recorder shall be optical disc or semiconductor memory card type.

The digital recorder shall be equipped with the RS-422 control interface and video signal process shall be 4:2:2. Its output signal shall be serial digital signal supported by ITU-R.

4-2-5. Field Recording (ENG) System

(1) Outline

Five (5) sets of ENG system shall be provided. Each set shall compose one (1) unit of Camcorder whose recording format is the 4:2:2 Component Digital which is same as those of studio and editing systems to be provided under the Project, microphones (interview microphone and gun microphone), 4ch compact mixer, field monitor, lighting equipment, etc.

(2) Key Specifications

1) Camera Equipment:

The Camcorder shall be 3-chips CCD portable type for multi purpose use. The CCD shall be of IT or FIT Type and S/N ratio shall be more than 60db. The frame size shall be 4:3 and 21 times (or more) zoom lens shall be equipped with x2 extender. The recording media of the digital recorder shall be optical disc or semiconductor memory card type. Recording time of a media shall be 60 minutes or more at 4:2:2.

2) Audio System:

The Compact Audio Mixer shall have 4 analog inputs (or more) and shall be driven by both dry battery and 12V DC. Each channel shall have Pan Pot and Equalizer for stereo recording.

3) Lighting System:

It shall compose a battery light set, cam-light set and five (5) pcs of lamp for each light.

4-2-6. Portable Light Set for ENG:

A Portable Light Set shall compose the followings:

- 1000W Light with Stand x 2 sets
- 650W Light with Stand x 3 sets
- Carrying case
- AC cable with reel

4-2-7. Wireless Microphone for ENG:

This wireless microphone shall be the UHF band synthesizer type. The transmitter shall be pocket type with a lavalier microphone. The receiver shall be camera mount type with diversity receiving function.

4-2-8. Video Non-Linear Editing System

(1) Outline

The system shall enable to transfer digital data in a recording media to hard disk in CPU System for editing.

(2) Key Specifications

1) Video Editing System:

The Video signal shall be processed on the high quality of 4:2:2. The sampling frequency of the Audio signal shall be 48kHz. Video signal and Audio signal can be edited separately. The software for Non-linear Editing shall be Final cut pro or equivalent.

2) Digital Recorder:

The record media of the digital recorder shall be optical disc or semiconductor memory card type.

The digital recorder shall be equipped with the RS-422 control interface and video signal process shall be 4:2:2. Its output signal shall be serial digital signal supported by ITU-R.

4-2-9. 1:1 Editing System

(1) Outline

The system shall be a simple cut editing system which consists of one Digital Recorder (PB) and one Digital Recorder (REC/PB) and shall be operated by an editing controller. As for the video pictures, only cut editing can be done without adding any special effects.

(2) Key Specifications

1) Editing Controller:

The editing controller shall enable to control both Digital Recorder (REC/PB) and another Digital Recorder (PB), set the in-point and out-point of the editing and execute the video editing. Two editing modes, i.e. assemble editing and insert editing, shall be provided and time code can be operated as required.

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2) Digital Recorder:

The record media of the digital recorder shall be optical disc or semiconductor memory card type.

The digital recorder shall be equipped with the RS-422 control interface and video signal process shall be 4:2:2. Its output signal shall be serial digital signal supported by ITU-R.

4-2-10. Maintenance Equipment and Tools

(1) Outline

Since both analog and digital equipment are used for TV program production, measuring equipment shall be provided for confirmation of operating conditions, measurement of signals, etc., so as to keep the quality of audio and video signals and maintain the equipment properly.

(2) Key Specifications

1) Digital Oscilloscope (500MHz):

This equipment shall have a function which can display video signal waveform up to 500MHz.

2) Multi Format Digital Waveform Monitor:

It shall be provided to measure the performance of the analog composite video signal and Digital SDI video signal.

The main measurement items shall be Waveform, Vector, Basic jitter, Eye-pattern and Arrowhead.

3) Video Test Signal Generator:

This equipment shall be provided to generate test signal necessary for measuring and/or adjusting of the equipment.

4) Analog Audio Analyzer:

This equipment shall be provided to measure automatically various audio signal parameters such as Distortion, S/N, etc.

5) Tool Kit:

One set of tools, which is designed for broadcasting equipment, for daily and periodical maintenance shall be provided with a carrying case.

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4-2-11. Consumable parts

The following consumable parts shall be provided for trial and initial operations.

- 1) Recording Media  
(Quantity and recording time: 1 hour/pc x 1,000 pcs = 1,000 hours or equivalent at 4:2:2.)
- 2) CD-RW (700MB/pc)
- 3) DVD-RW (4.7GB/pc)

4-3 Drawings

<u>Dwg. No.</u>	<u>Title</u>
G-01-1	Building Layout of RTD (GF)
G-01-2	Building Layout of RTD (1F)
G-02	Composition of Broadcasting System for Production Studio, News Studio, Master Control
G-03	Composition of Broadcasting System for Format Conversion, Non-Liner Editing, 1:1 Editing
G-04	Composition of Broadcasting System for Field Recording (ENG) System
Sy-01	Schematic Diagram of Video/Audio Signal Flow
Sy-02	Schematic Diagram of Video/Audio Sync & TRK Line
Sy-03	Block Diagram of Production Studio Video System
Sy-04	Block Diagram of Production Studio Audio System
Sy-05	Block Diagram of Production Studio Intercom System
Sy-06	Block Diagram of News Studio Video System
Sy-07	Block Diagram of News Studio Audio System
Sy-08	Block Diagram of News Studio Intercom System
Sy-09	Block Diagram of Master Video System
Sy-10	Block Diagram of Master Audio System
Sy-11	Block Diagram of Format Conversion System
Sy-12	Block Diagram of Video Non-Liner Editing System
Sy-13	Block Diagram of 1:1 Editing System
L-01	Floor Layout of Production Studio
L-02	Floor Layout of News Studio and Master Control