

Activity Report of Asia-Pacific Medical Network Project in Kyushu University Hospital : Vol.6

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4. New Instruments and Technical Tips

4.1 Preface

In December 2007, we released a standard configuration of DVTS during the first Asia Telemedicine Symposium at Kyushu University Hospital. This standard configuration incorporates knowledge gained from more than one hundred events and three hundred connected sites. Using this configuration and with some assistance from engineers, various high quality telemedicine activities can be carried out, better than before.

On the other hand, the “simple and easy setup”, a feature of the DVTS system, is more complex with this standard configuration, while the equipment required is also more than before. It may, therefore, be difficult for new institutes to configure the necessary equipment when first connecting, considering that these institutes are medical departments without the necessary audio visual equipment and technical staff for telemedicine activities.

To ensure the continued distribution and use of our application, a method for easy configuration and handling is necessary. We have thus created a “DVTS package”, compatible with the standard configuration.

Refer to Section 4.7.1 of the DVTS package manual for the details.

In addition, a VPN router configuration manual, an introduction to each institute’s DVTS setup, and a report on the high definition support teleconference system are also included as new content.

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4.7.1 DVTS Package




Instructions for DVTS Package

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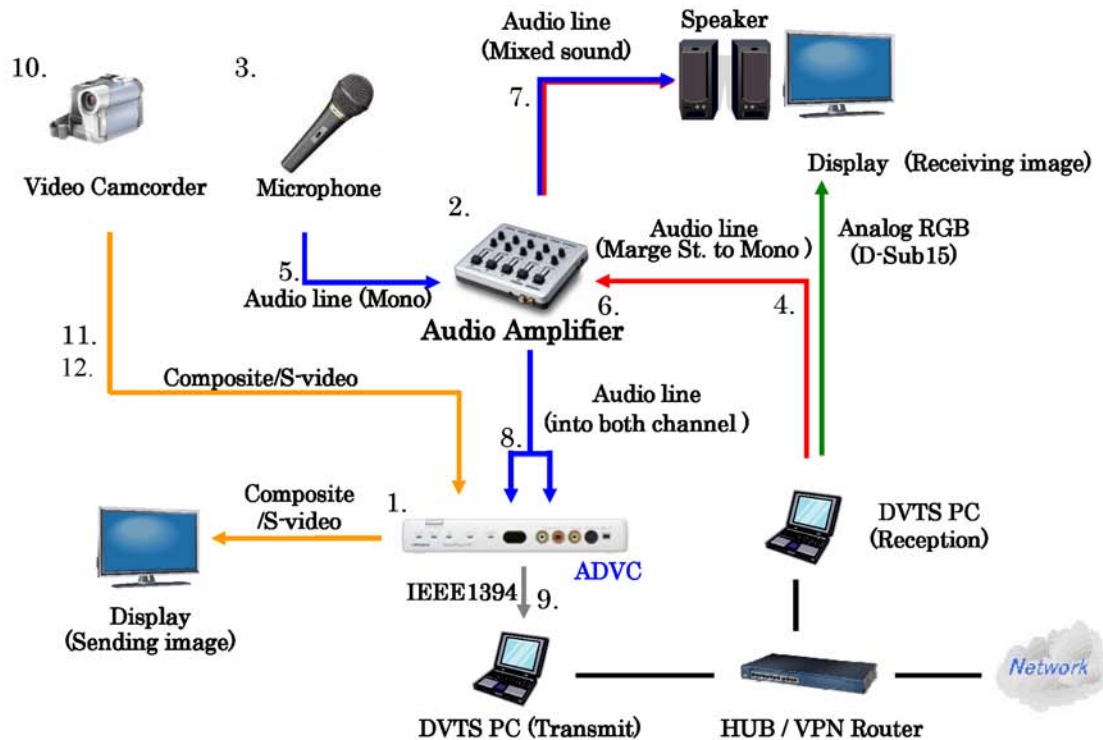
1. Included items

No	Company	Product		
1	Thomson Canopus	TwinPact100(RC)	1	
2	audio-technica	Portable Multi Mixer AT-PMX5P	1	
3	audio-technica	Dynamic Vocal Microphone PRO-100	1	Bagging item
4	JVC	CN-207A (ϕ 3.5-St \rightarrow ϕ 3.5-Mono 1.5m)	1	Connected to 1
5	JVC	CN-230A (ϕ 6.3mono extention 5m)	2	Connected to 1
6	JVC	AP-100A (ϕ 3.5-Mono \rightarrow ϕ 6.3mono exchange plug)	1	Connected to 1
7	JVC	CN-186G (RCA \times 1 \rightarrow RCA \times 2 3M)	1	Connected to 1
8	JVC	CN-166G (RCA \times 1 \rightarrow RCA \times 2 1.5M)	1	Connected to 1
9		IEEE1394 4PIN-4PIN, 4PIN-6PIN	2	Bagging item
10	Hitachi	Video camera DZ-HS803	1	1
11	JVC	VX-130E (Composite extention cable)	1	Connected to 1
12	JVC	VZ-97(RCA extention plug)	1	Connected to 11
13	Elecom	EHP-TVAP120SV (Headphone)	1	
14	Elecom	T-S22430WH (Extension power cable 3m)	1	Bagging item
15	Kashimura	Outlet exchange plug (worldwide model)	1	Bagging item
16	Velbon	CX-444 (Tripod)	1	

Required equipments

Item	Specifications
DVTS PC 	Recommended spec OS: Microsoft Windows XP, CPU: Pen-IV, III, M, Celeron over 2GHz, RAM: over 256-512MB RAM, Graphic card: Required to work DirectX, Network card: 100Mbps or over, IEEE1394 port: OHCI compatible We recommend to use 2PCs for each stream (Send & Receive).
Display & Speaker 	Very important factor for video image impression. Flat panel monitors (LCD or PDP) are recommended. Require enough brightness for projector. (At least 3000 ANSI for small room, over 5000 for large room)
DVTS software 	DVTS for WindowsXP http://www.sfc.wide.ad.jp/DVTS/software/win2000/ Copyright(c)2001 WIDE project & DVTS Consortium

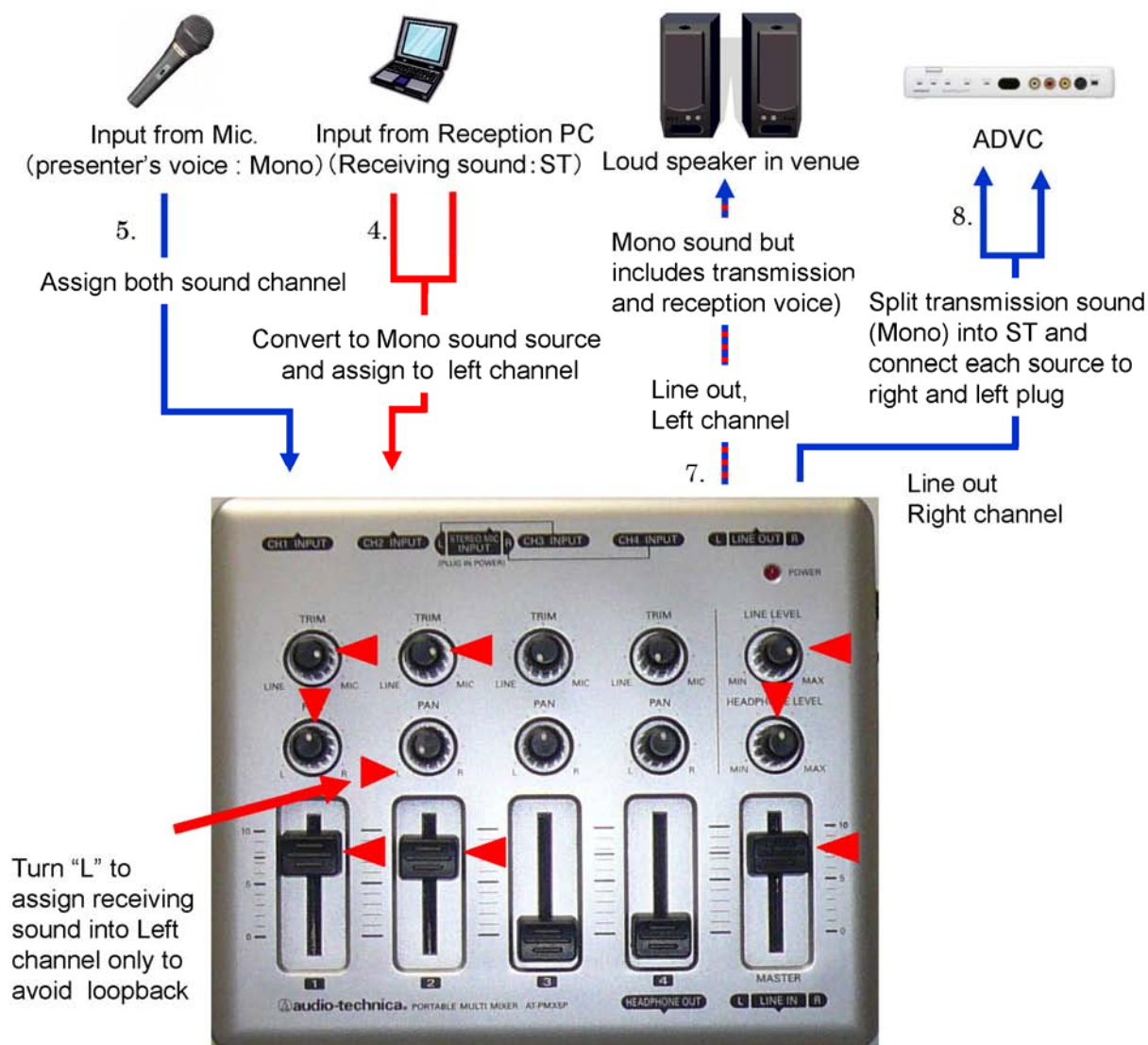
2. Configuration Diagram



Features:

This package includes “Twinpack 100” which is an Analog-Digital video converter. “Twinpack 100” converts analog video signal and analog RGB to digital video signal.

2. Configuration Diagram -Audio part-



Features:

This package handles two sound sources (Transmission/ Reception) with "STEREO (Right and Left)" channel. Each sound source is assigned to a channel and controlled independently and easily.

Red arrows on audio mixer show default settings for each knob.

3. Stereo- Monaural problem

“Stereo – Monaural problem” was caused by the sound format of DV signal which supports stereo sound. For example as the point C (“C”) in the following schema, where uses right channel for sound input, “A” can hear “C” voice normally but “B” can not hear “C” voice, because “B” does not connect right channel output into their loud speaker.

We call this problem as “Stereo- Monaural problem”.

This package is designed for avoiding the problem, with inputting monaural sound into both channel of transmission ADVC and merging reception stereo sound by “stereo to monaural cable” to handle as monaural, as mentioned page 4.

Point A			Point B		
	Rt.	Lt.		Rt.	Lt.
Send	○	○	Send	×	○
Receive	○	○	Receive	×	○
Point C			Point D		
	Rt.	Lt.		Rt.	Lt.
Send	○	×	Send	○	×
Receive	○	×	Receive	×	○

○ : Use
× : No use

Receive	A	B	C	D
Send	A	B	C	D
A		○	○	○
B	○		×	○
C	○	×		×
D	○	×	○	

○ : Audible
× : No audible

4. Package Detail

1. Package overview



2. Inside package



3. Bagging Items



Camera, Cables

ADVC, amplifier

Cables between ADVC and amplifier are already connected. Do not remove them.



Microphone
Microphone cable



IEEE 1394 cable
Power cable, plug



- 1) Video Camera
- 2) Output cable
(Composite, S-video, sound)
- 3) AC adapter
- 4) AC adapter cable
- 5) Battery
- 6) Remote Commander

5. Installation -1

Installation image



1. Camera



Connect output cable to camera



Connect AC adapter cable and AC adapter



Connect Composite cable to video extension cable
This cable is connected to video input on ADVC (already connected)

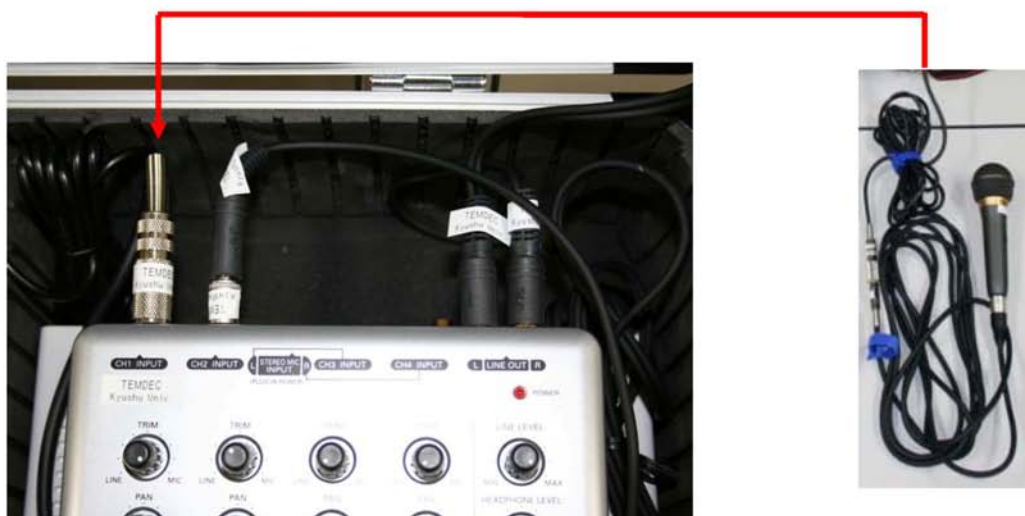


5. Installation -2

Installation image



2. Microphone



Connect microphone cable to extension cable which connected to the sound input channel 1 on the amplifier

5. Installation -3

Installation image



3. Reception sound

Item No. 4



Reception PC



Connect Reception PC sound headphone out into sound input channel 2 on amplifier with stereo mini -> monaural mini cable and monaural mini cable -> standard exchange plug (amplifier side is already connected)

5. Installation- 4

Installation image



Reception PC

Transmission PC

3. IEEE1394

Item No. 9



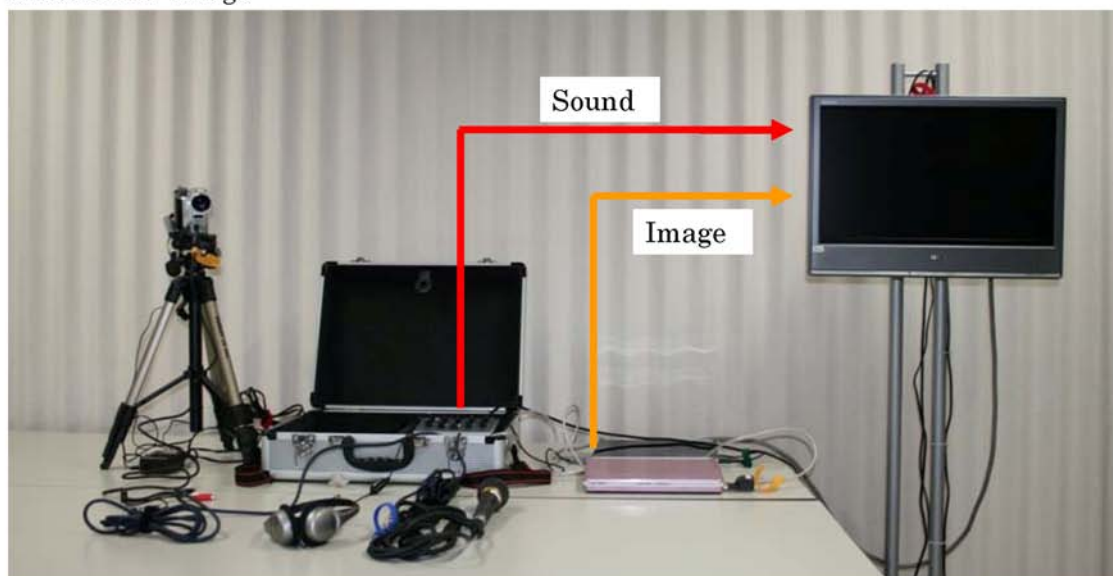
Transmission PC



Connect the IEEE1394 cable between Twinpack 100 and the IEEE1394 port on DVTS transmission PC (DVTS PC is not included in this package)

5. Installation -5

Installation image



4. Reception Image and sound

Reception PC



Connect RGB cable (D-Sub15)
from RGB output on Reception PC
to display
(display is not included in this system)

Item No. 7

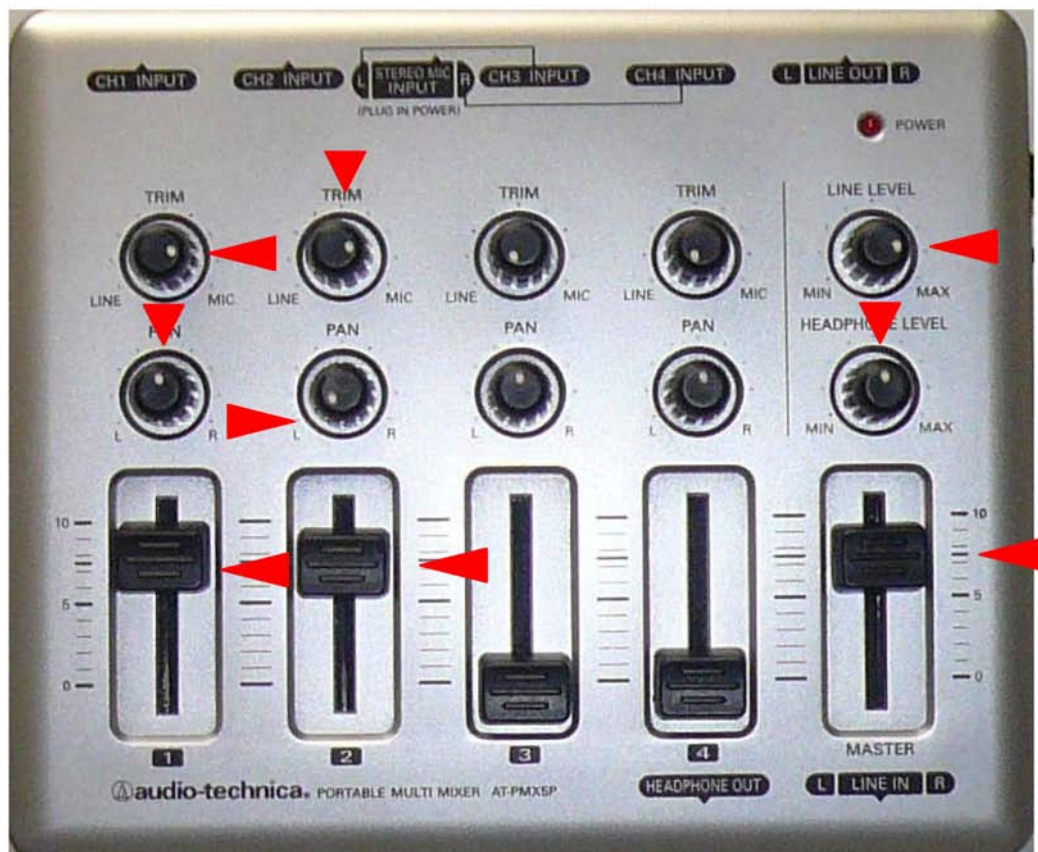


Connect RCA cable (RCA $\times 1 \rightarrow \times 2$)
from main out Left channel on
amplifier to sound input channel on
speaker system

5. Installation -6

Home position of each knob

Power SW



Channel 1 TRIM: 3 o'clock, PAN: Center, Level : 7.5

(If you do not want to hear local presenter's voice from venue speaker, set PAN as Right)

Channel 2 TRIM: 9 o'clock, PAN: Left, Level : 7.5

Channel 3 and 4: TRIM: LINE (minimum), PAN: center, Level : 0

LINE LEVEL: 9 o'clock

MASTER: 7.5

HEADPHONE LEVEL: Center

Amplifier specification

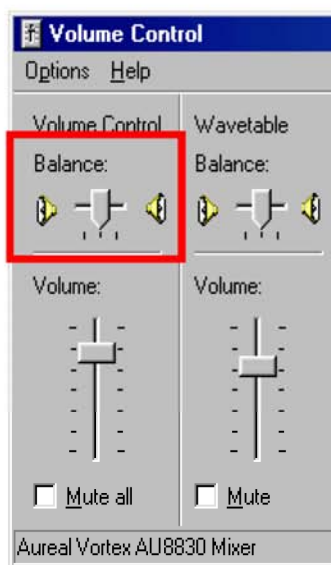
INPUT: +10dBV (TRIM=MIN), -50dBV (TRIM=MAX)

OUTPUT: -10dBV

6. Sound property check.

*Sound output

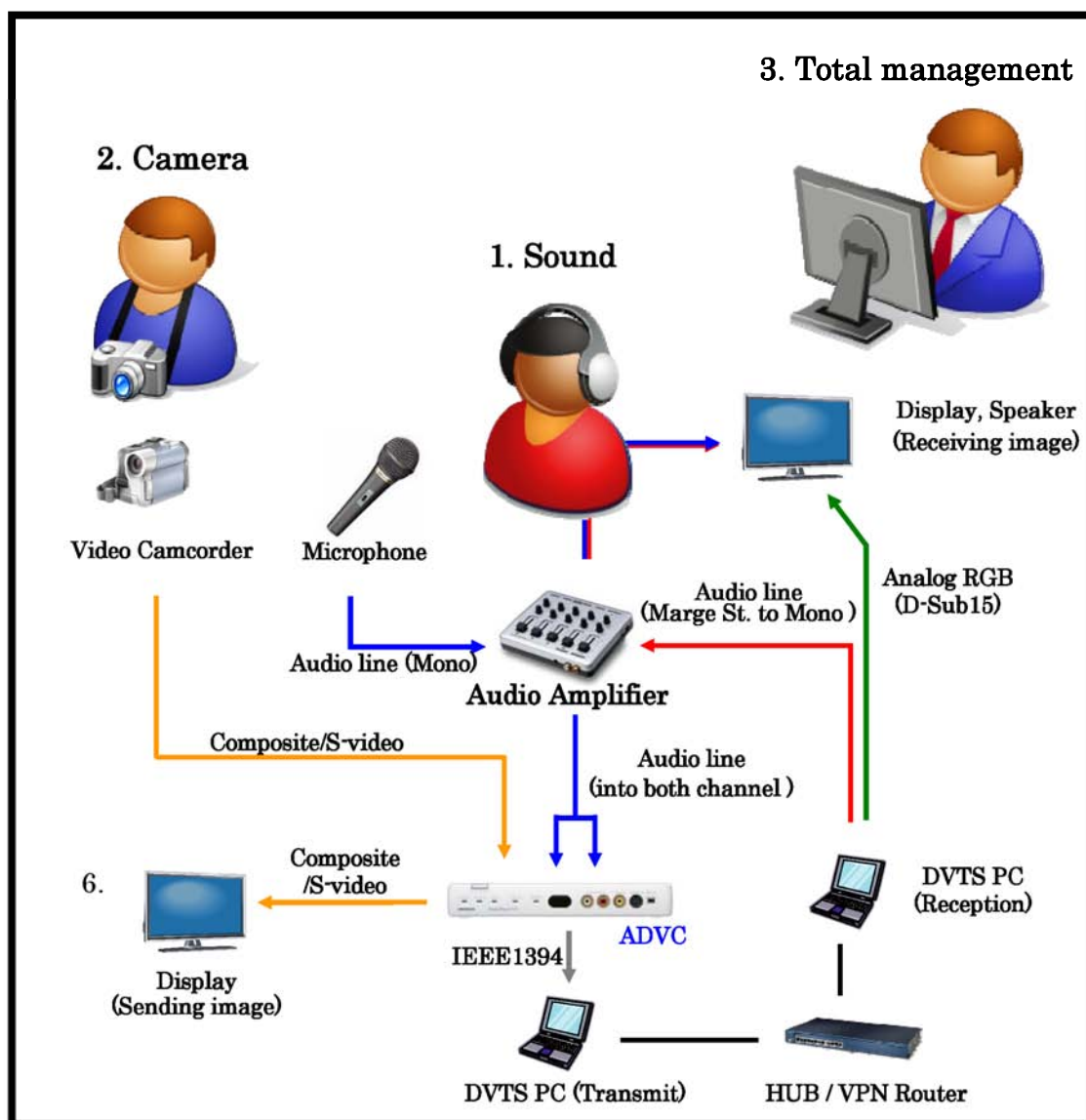
Check your connection between DVTS PC sound output port and Speaker system, if you are able to hear both side sound, by using Music CD and Balance slider on Volume Control window. (Slide it to edge side)



Hear sound from both side

7. Staff allocation

Need 2 staff for casual event, 3 staff for regular event



1. Sound Check and adjustment

- broken voice
- sound level is too strong or too soft
- microphone position

2. Camera handling

- Video camera and Digital camera (taking pictures)
- Switch image between venue and presentation.

3. Total management

- Contact with other stations and support presenter etc.

4.7.2 VPN router configuration (AR550s)

Update : 5.4.2010

VPN Router (CentreCOM AR550s by Allied Telesis K.K)
Configuration Manual

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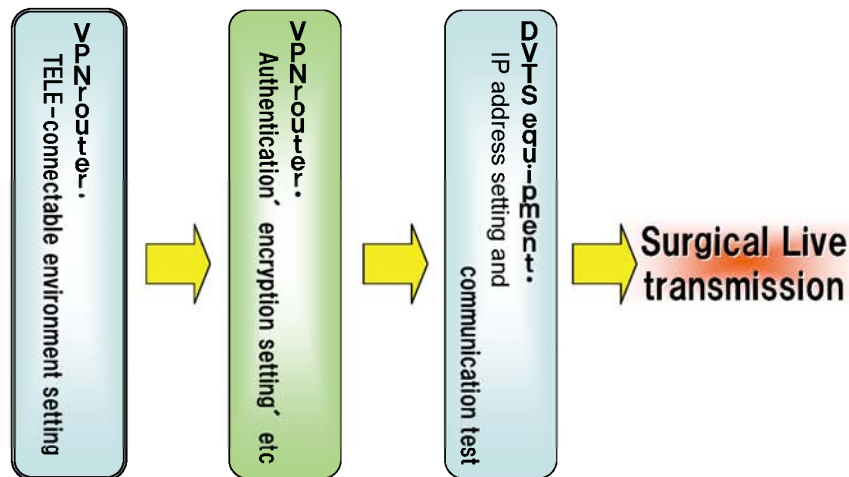
Update : 5.4.2010

1 Abstract

To participate in telemedicine at Kyushu University Hospital, a VPN router is needed to transmit live surgery and patient information. Detailed configuration of the VPN router registered to Prof. Okamura at Kyushu University can be done remotely. However, configuring the tele-connectable environment needs to be done in advance.

In this manual, we explain how to configure the VPN router for transmission of live surgery.

~Flow of equipment configuration for live surgical transmission~



(person in charge) Local engineer | Network engineer | Local engineer

2 VPN router configuration

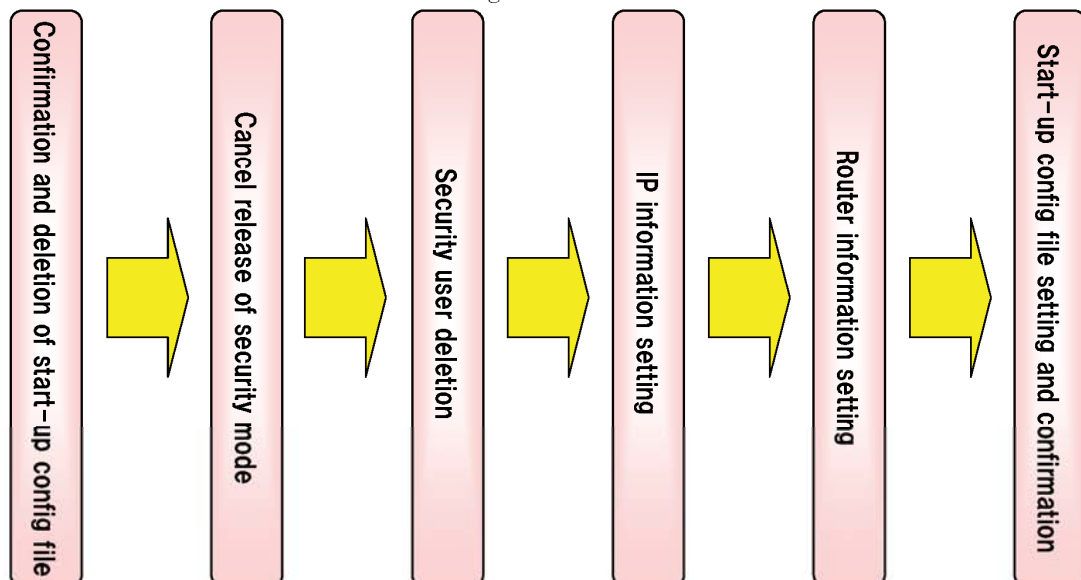
The specific VPN router described below is required in this application.

Name: Advanced VPN access router

Product name: CentreCOM AR550s or 570s (International model: AT-AR750s)※

Manufacturer: Allied Telesis K.K.

~Flow of tele-connectable environment configuration on VPN router~



Update : 5.4.2010

2.1 Login and confirmation of startup config file

(Advance preparation)

Connect the console port (or LAN port) on the VPN router to the PC using a cable.

For console cable use, software setting is Hyper terminal or TeraTerm.

For LAN cable use, software setting is the command prompt ※.

※IP address of LAN interface default setting: 192.168.1.1 (DHCP in operation)

Login to the VPN router and confirm startup config file.

```

Tera Term - COM1 VT
ファイル(F) 編集(E) 設定(S) コントロール(C) ウィンドウ(W) ヘルプ(H)

fuzimotoVPN login: secoff
Password:

SecOff fuzimotoVPN> show conf

Boot configuration file: flash:vpn.cfg (exists)
Current configuration: flash:vpn.cfg

SecOff fuzimotoVPN> show fi

Filename           Device    Size    Created          Locks
-----
55275-03.rez       flash    3701184  05-Jun-2006 19:15:59  0
boot.cfg           flash     233     08-Nov-2005 05:19:27  0
config.gui         flash     475     05-Jun-2006 21:04:40  0
config.ins         flash     32      20-Jun-2006 15:32:24  0
d550sj15.rsc       flash   3443194  31-Oct-2005 09:58:13  1
d550sj18.rsc       flash   3418303  05-Jun-2006 19:16:37  0
enabled.sec        flash      8       24-Jul-2006 14:52:09  0
enc1.ukf           flash    1508    24-Jul-2006 14:40:39  0
enc2.ukf           flash    1508    24-Jul-2006 14:42:19  0
enc3.ukf           flash     70      24-Jul-2006 14:43:39  0
feature.lic        flash     78      26-Jan-2006 17:09:34  0
gui.ins            flash     64      08-Nov-2005 05:19:50  0
help.hlp           flash   107585  05-Jun-2006 19:16:29  0
longname.lfn       flash     17      20-Jun-2006 15:22:54  0
prefer.ins         flash     64      05-Jun-2006 19:17:01  0
release.lic        flash     64      05-Jun-2006 19:16:59  0
vpn.cfg            flash     4145    25-Jul-2006 07:52:10  0
  
```

① Login

Login ID: secoff

Login password: secoff

② Confirmation of startup config file

Input [show conf] command, and confirm startup config file.

Underlined text is the startup config file name.

Boot configuration file: flash : startup config file.cfg

([vpn.cfg] is the startup config file in the figure above.)

Then, confirm startup config file "vpn.cfg" via [show fi] command.

Update : 5.4.2010

2.2 Startup file deletion

Deleting the current startup file is done as follows.

```

Tera Term - GOM1 VT
ファイル(F) 編集(E) 設定(S) コントロール(C) ウインドウ(W) ヘルプ(H)
vpn.cfg      flash      4145      25-Jul-2006 07:52:10  0
-----
SecOff fuzimotoVPN> DELETE FILE=vpn.cfg

This is a security command, enter your password at the prompt.
Password:
flash:vpn.cfg successfully deleted
1 file deleted.

Info (1056003): Operation successful.

SecOff fuzimotoVPN> show fi

```

Filename	Device	Size	Created	Locks
55275-03.rez	flash	3701184	05-Jun-2006 19:15:59	0
boot.cfg	flash	233	08-Nov-2005 05:19:27	0
config.gui	flash	475	05-Jun-2006 21:04:40	0
config.ins	flash	32	20-Jun-2006 15:32:24	0
d550sj15.rsc	flash	3443194	31-Oct-2005 09:58:13	1
d550sj18.rsc	flash	3418303	05-Jun-2006 19:16:37	0
enabled.sec	flash	8	24-Jul-2006 14:52:09	0
enc1.ukf	flash	1508	24-Jul-2006 14:40:39	0
enc2.ukf	flash	1508	24-Jul-2006 14:42:19	0
enc3.ukf	flash	70	24-Jul-2006 14:43:39	0
feature.lic	flash	78	26-Jan-2006 17:09:34	0
gui.ins	flash	64	08-Nov-2005 05:19:50	0
help.hlp	flash	107585	05-Jun-2006 19:16:29	0
longname.lfn	flash	17	28-Mar-2007 04:42:29	0
prefer.ins	flash	64	05-Jun-2006 19:17:01	0
release.lic	flash	64	05-Jun-2006 19:16:59	0

```

SecOff fuzimotoVPN>

```

① Startup file deletion

Input [delete file="file name"] to delete the startup file.

([vpn.cfg] is the startup config file that should be deleted in the figure above.)

② Confirmation of startup file deletion

Input [show fi] command, and confirm that the startup file has disappeared.

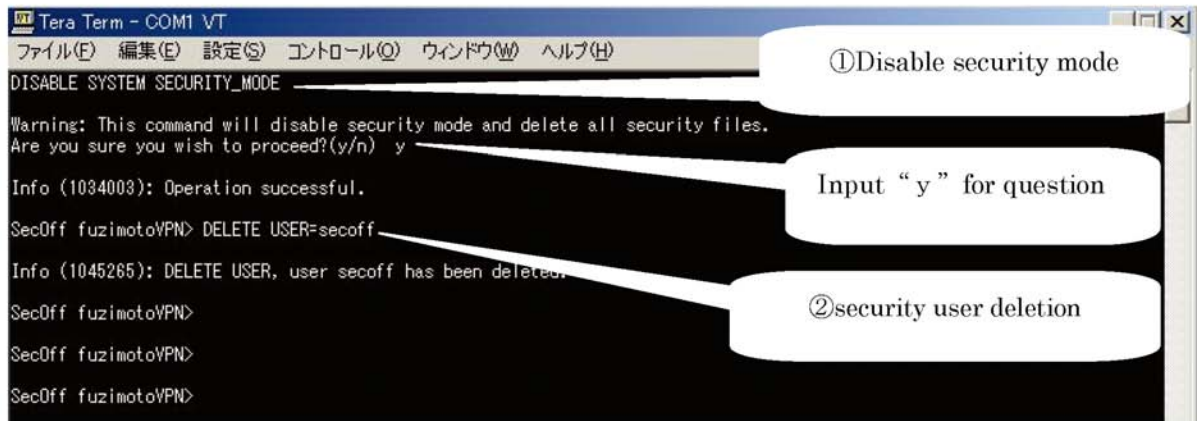
(You can confirm that the startup file has been deleted in the figure above.)

Update : 5.4.2010

2.3 Disable security mode and delete security user

Disabling the security mode and deleting the security user login, returns the system to the normal mode and to the manager level login (user level).

Initial configuration of the VPN router has now been accomplished.



① Disable security mode

By issuing the [disable system security_mode] command, security mode is disabled.

This command needs to be confirmed by typing "y" in answer to the question: "Are you sure you wish to proceed? y/n".

② Delete security user

Inputting [delete user="user name"] deletes the security user.

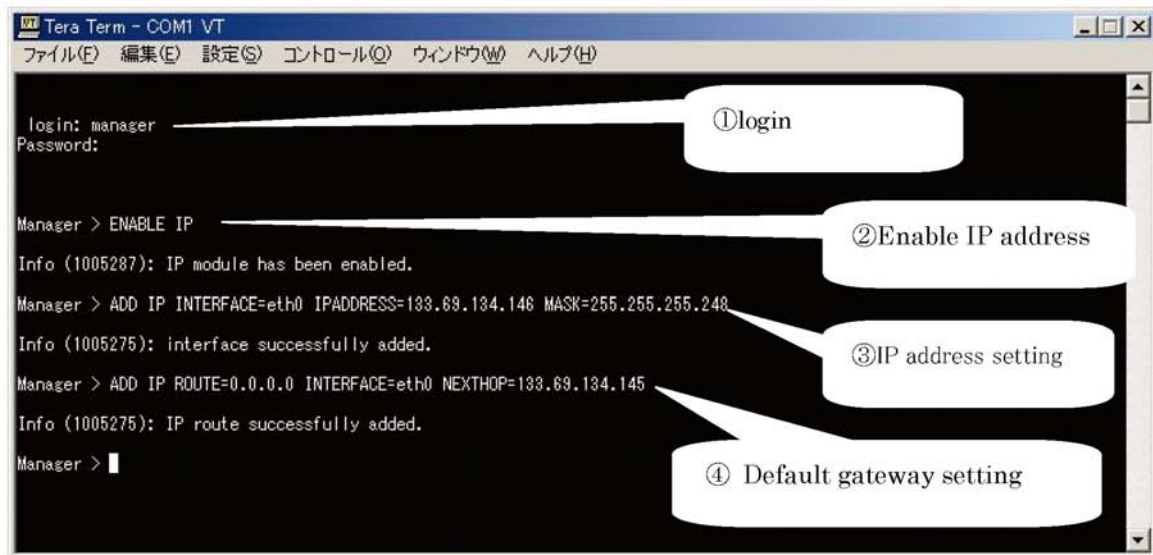
("secoff" is the name of the user to be deleted in the figure above).

Update : 5.4.2010

2.4 Setting the IP information

To set the new IP information on the VPN router, first power off the device and then turn it on again.

Login with the manager user level.



① Login

To login use the default ID and password, as this is the initial setting for the VPN router.

Login ID: manager

Login password: friend

② Enable IP address

Input the command [enable ip] to enable the IP address.

③ IP address setting

To set the VPN router's IP address, input the command given below.

`add ip interface="WAN interface" ipaddress="*. *.*.*" mask="*. *.*.*"`

(This sets 133.69.134.146/29 on eth0 in the figure above.)

④ Default gateway setting

To set the VPN router's default gateway, input the command given below.

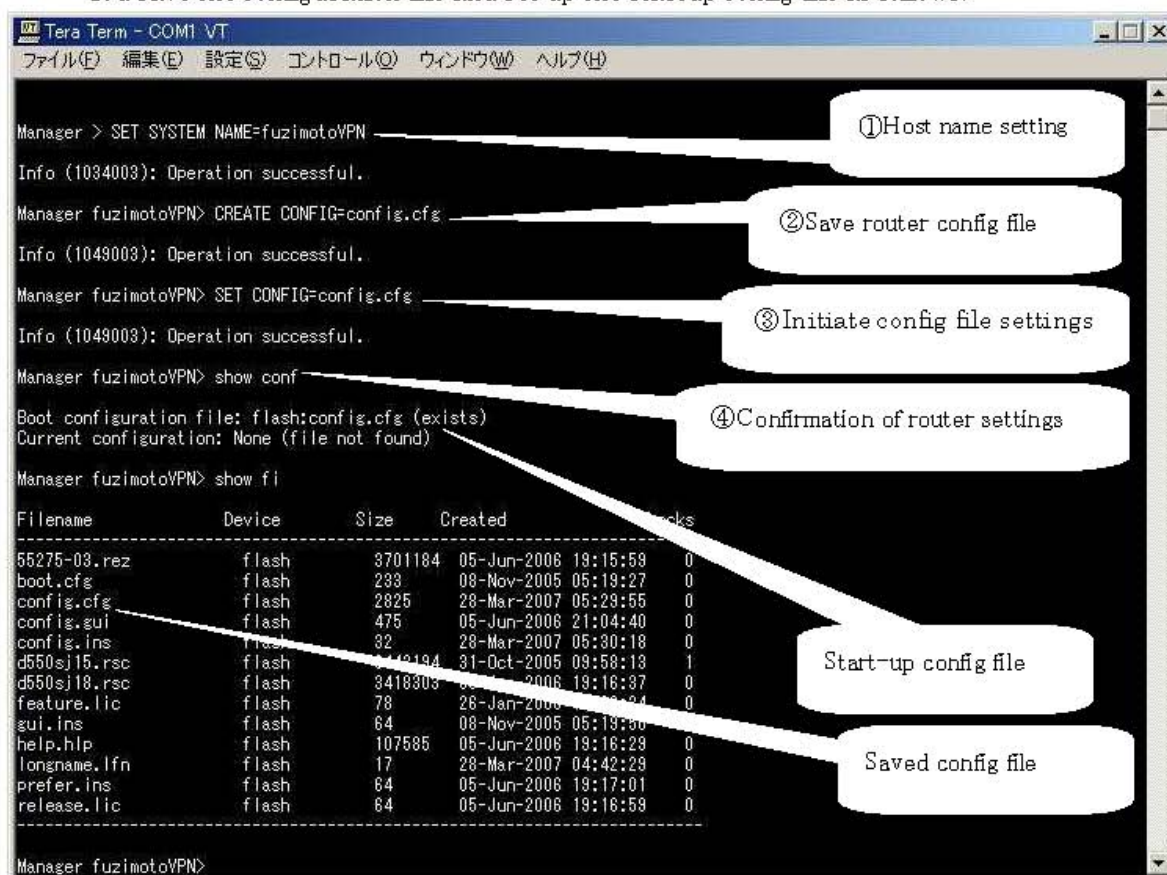
`add ip route=0.0.0.0 interface="WAN interface" nexthop="default gateway IP"`

(This sets 133.69.134.145 on eth0 as the default gateway in the figure above.)

Update : 5.4.2010

2.5 Save router config file and create startup config file settings

You save the configuration file and set up the startup config file as follows.



① Host name setting

Input [set system name="host name"] to set the host name of the VPN router.
(This sets "fuzimotoVPN" as the host name in the figure above.)

② Save router config file

Input [create config="config file name.cfg"] to save the VPN router settings, and create the config file.
(This sets "config.cfg" as the config file in the figure above.)

③ Initiate config file settings

Input [set config="config file name.cfg"] to assign the file to be used in resetting the router.
(This sets "config.cfg" as the startup config file in the figure above.)

④ Confirmation of router settings

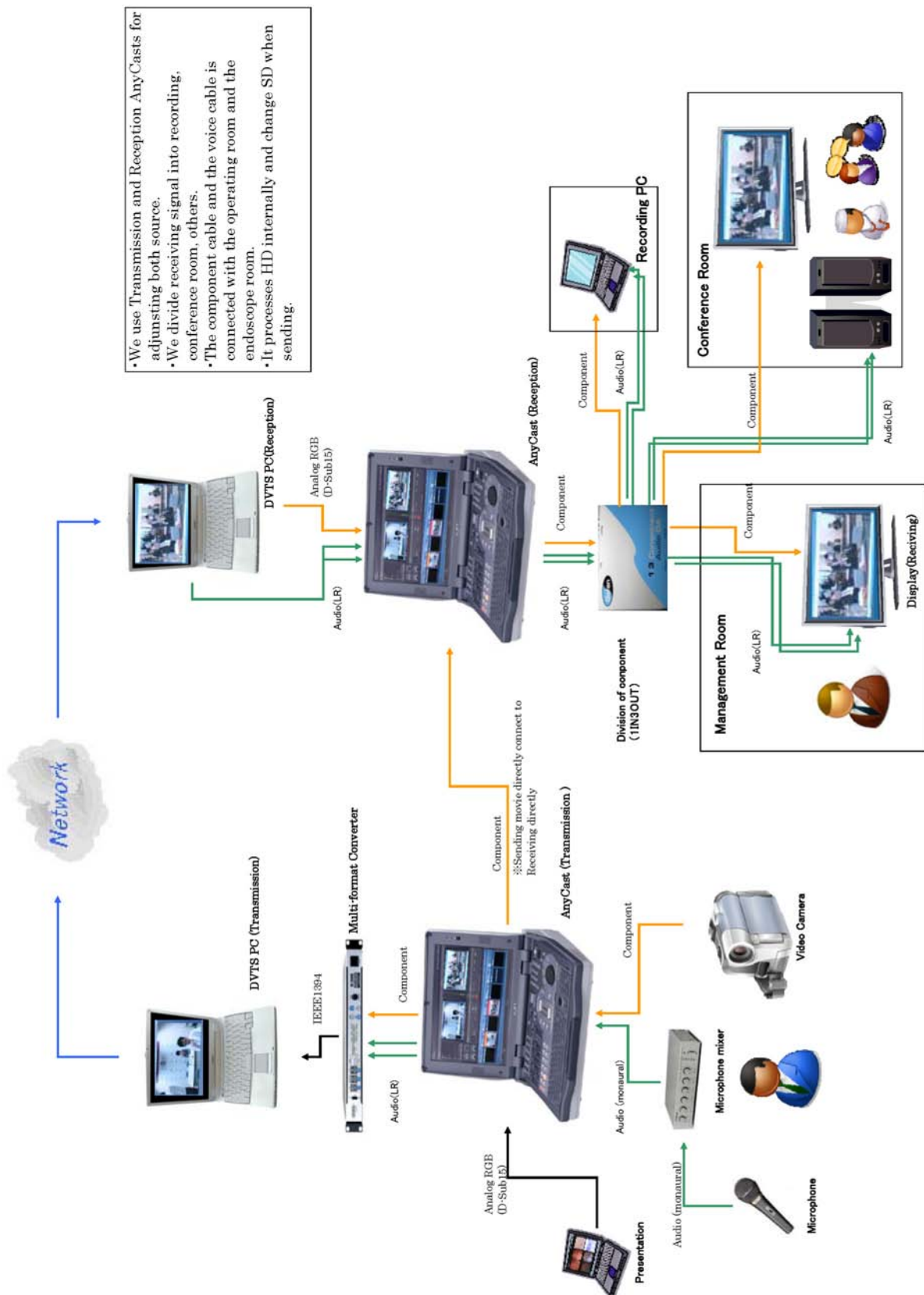
Confirm the correct startup config file via the [show conf] command.

Then, confirm the saved setting file via the [show fi] command.

After these confirmations, verify the reachability of the VPN router using ping and a telnet connection from another segment (or network) to the eth0 IP address.

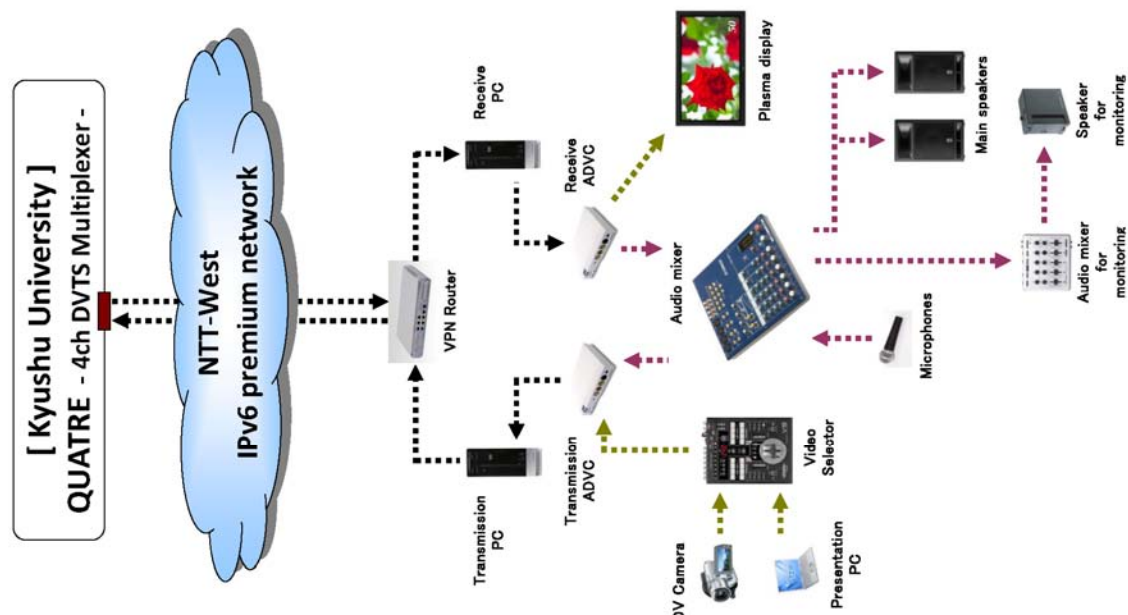
4.7.3 Configuration detail of each institute

4.7.3.1 Kyushu University Hospital, Fukuoka, Japan



4.7.3.2 Kyoto 2nd Red Cross Hospital, Kyoto, Japan

4) Configuration diagram (Default setting image)



- Information of the DVTs setting image of Kyoto 2nd Red Cross Hospital -

1) Staff

- Akihiro FUJITANI (Local engineer)
- Masami TOKUNAGA (Network engineer, NTT-West corp., WIDE project, CKP)
- Kiyohito TANAKA (Director, Medical Doctor, Department of Gastroenterology)

2) Network environment

- Flet's "HIKARI" Premium (IPv6 Premium Network) by NTT-West corp.

3) Using devices list

- VPN Router (Allied-Telesis AR550)
- Analog Digital Video Converter (CANOPUS ADVC 110) × 2
- Desktop PC for the DVTs (HP s3540jp, WindowsVista SP2) × 2
- Notebook PC for the DVTs (Lenovo ThinkPad X60, WindowsXP SP3) × 2
- NTSC Video camera (SONY CDR-DVD505)
- NTSC Video camera (SONY CCD-VX1)
- NTSC Video camera (CANON VC-C4)
- Video selector (Roland EDIROL V-8)
- Plasma display (NEC PX-50MX3N)
- Audio mixer (YAMAHA MG124C)
- Main Speakers (YAMAHA MSR100)
- Audio mixer for monitoring (Audio-Technica AT-PMX5)
- Speaker for monitoring (Audio-Technica AT-SP222)
- Microphones (Wired and Wireless)

4.7.3.3 Fukuoka University Hospital, Fukuoka, Japan

1. Items (DVTS Tele-Conference System with single PC)

VPN router (-), H.263 compatible conference terminal(-), ADV C(Canopus ADV C110)

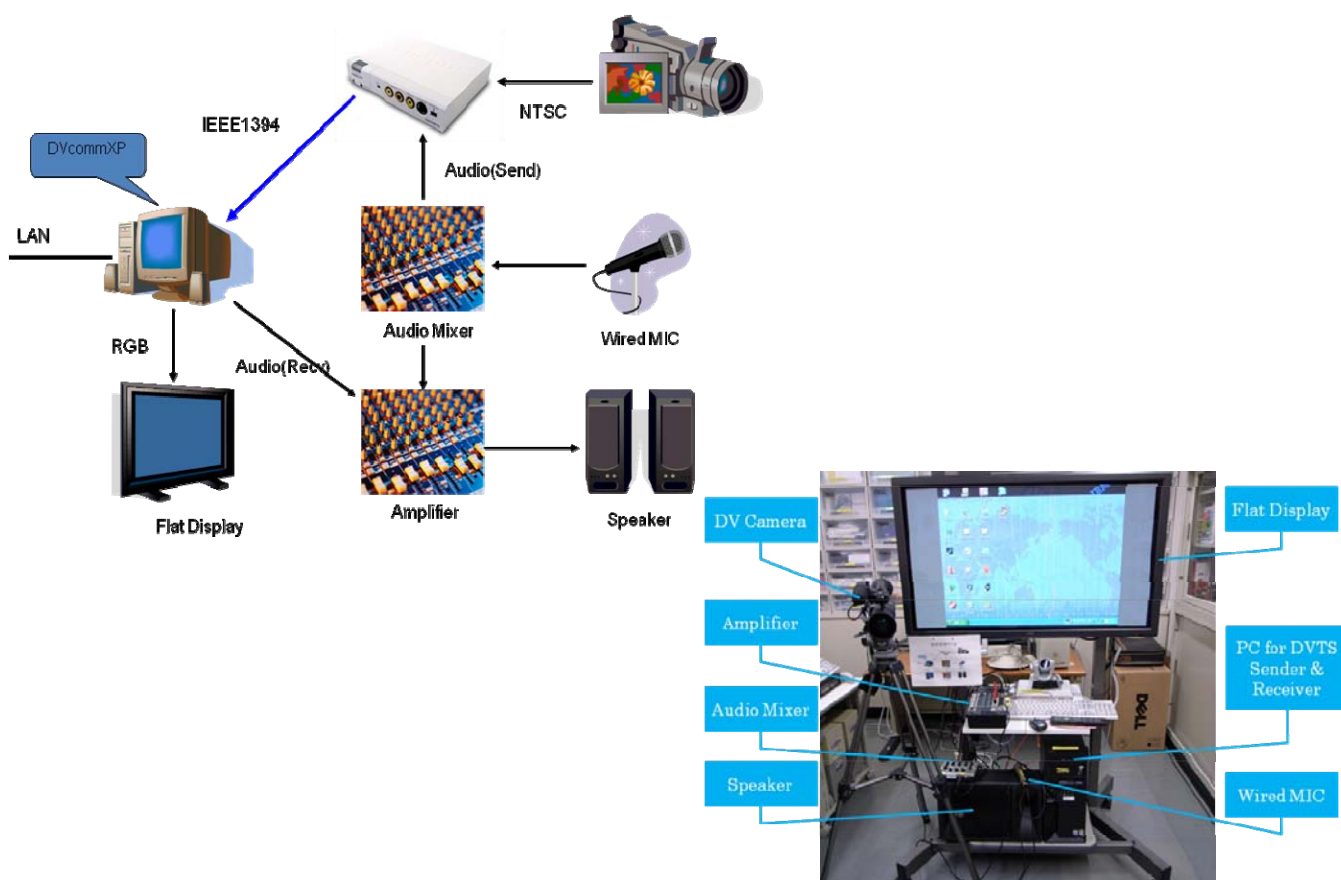
NTSC camera (SONY, DSR-PD170), PAL camera (-), NTSC-PAL converter(-)

DVTS Software (Fat Software, DVcommXP Ver.2)

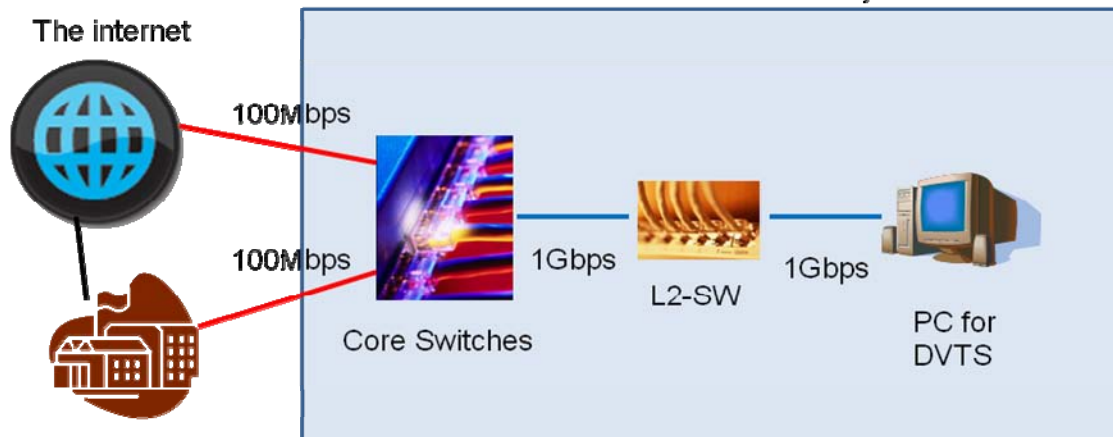
Video Live Switer (Yamaha), RGB Down Converter

We are planning to build a new conference room for teleconference at Sep 2010.

2. Configuration Diagram



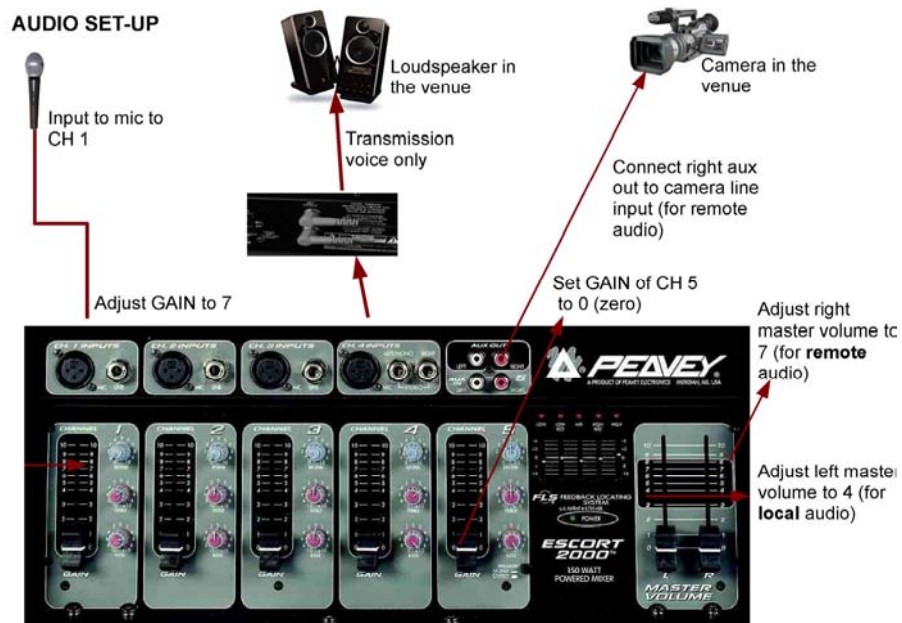
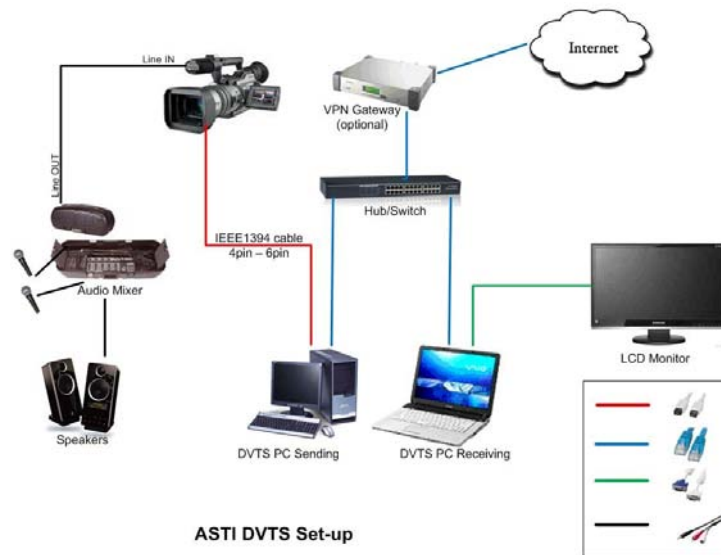
Fukuoka University



4. New instruments and technical tips

4.7.3.4 ASTI (Advanced Science and Technology Institute), Manila, Philippine

No	Company	Product	
1	Canopus	ADVC110	1
2	Peavey	Peavey Escort 2000	1
3	Peavey	Unidirectional Microphone	1
4	n/a	3.5-St – 3.5-Mono 1.5m	1
5	n/a	XLR – XLR cable	1
6	n/a	6.3 mono extension 5m	2
7	n/a	RCA – 3.5-St cable 10ft	1
8	n/a	IEEE1394 4PIN-6PIN	1
9	Sony	DCRVX2100	1
10	n/a	VGA extension cable	1
11	Davis and Sanford	F10 head Tripod	1



4. New instruments and technical tips

4.7.4 HD supported teleconference system demonstration report

4.7.4.1 1st demonstration on October 20th, 2009

Demonstration Plan

Date: Oct. 20th (Tue)
1500(JP), 1400(CN,TW,SG),1300(TH)

Connect station (JP)
KUH
Iidabashi TSF, Tokyo
Kyoto 2nd Red Cross Hospital

Connect station (Overseas)
National Taiwan University
NUS, SG
Siriraj Hospital, TH
Tsinghua University, CN

New teleconference system

Actual state

Multi connection event becomes mainstream.

- discuss with many doctors at same time.

Problem (DVTS+Quatre)

- Limitation of connecting stations (usually 4stations)
- HD handling
- NTSC/PAL compatibility

Requirements for new system

- SD/HD handling
- NTSC/PAL compatibility
- Lift connect limitation
- Support multi streaming rates (8M-2M)
- Easy sound handling
- No special device use
- NW Security included

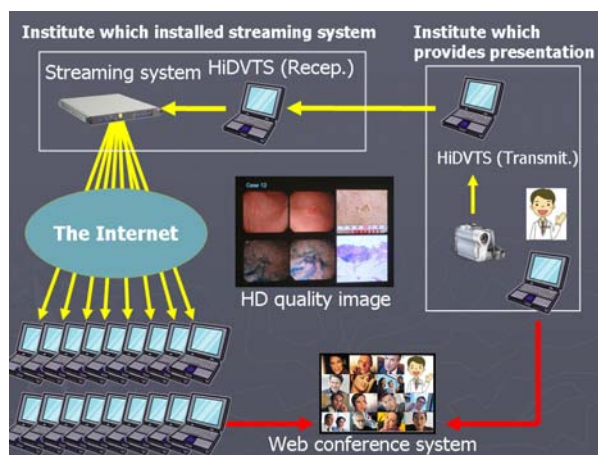
Key point of new system

Separate presentation and discussion



Discussion

Presentation
(Slide, Live surgery)



New conference system

Transmitting HD image

Hardware real time encoder
(Inlet Spinnaker 7000)
+ Streaming server
(Windows server)



Discussion

Web teleconference system
(Fresh voice)

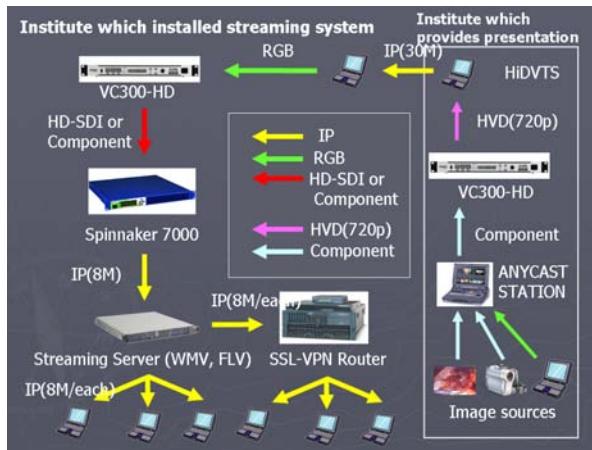


NW security (patient privacy)

SSL-VPN



4. New instruments and technical tips



Preparation for Fresh voice



Preparation for Fresh voice (appendix)

Fresh voice supports these video inputs.



USB video capture cable
(Instruction manual said this system supports only "Princeton PCA-DAV2" officially but if you have similar device, you can try to use it.)



DV driver
This driver software can simulate DV device as Webcam. (Trial version available)

Fresh voice accepts sound input via mic. plug on PC only.

If you use these method as above, you can use audio and visual equipment for DVTS one.

Preparation in each station

Web conference system
-PC, Web camera, Headset
(Refer to installation manual of the system)

HD image Reception PC
-PC, Flat display, projector etc.
(OS: Windows Xp or Vista, Core2Duo recommended, Windows Media Player)

Preparation for teleconferencing

Fresh voice
(Web conference system)



Sound input device
(Use Mic. input port on PC)
Video device
(Web cam is easy for using)

HD quality streaming
(Windows media player)



Flat display or projector

Preparation for HDV transmission (NTSC)

1. Minimal configuration



HDV camera



HiDVTs PC

IEEE1394

IP (30M)

HDV camera requirement: Ext. Mic. Input and manual Sound level control

*This configuration can handle only image source which shoot by camera

2. Advanced configuration



HD sources



ANYCAST STATION



VC300-HD (converter)



HiDVTs PC

IEEE1394

IP (30M)

Preparation for HDV transmission (PAL)

1. Minimal configuration



HDV camera



VLC PC

IEEE1394

IP (30M)

HDV camera requirement: Ext. Mic. Input and manual Sound level control

*This configuration can handle only image source which shoot by camera

2. Advanced configuration



HD sources



ANYCAST STATION



VC300-HD (converter)

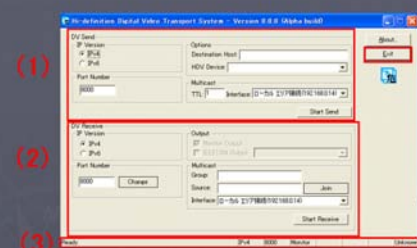


VLC PC

IEEE1394

IP (30M)

HiDVTs setting



1. Transmission setting
2. Reception setting
3. Status bar
4. Exit button

HiDVTs supports NTSC signal only
Time delay: approx. 1 sec.

4. New instruments and technical tips

SSL-VPN Gateway SSL-VPN Plus (Allied Telesis).

1. open the designated address
2. Input your ID and PW
3. Select "Full Access" and "CentreCOM Remote Access"
4. Client login software must open after installation.
5. Push login bottom (use same ID and PW)
6. You can access streaming server after login which located private network.
7. Open <http://192.168.100.10/> to get streaming.

Click  to open login window

Caution : NEVER USE Windows VISTA
This system accepts ONLY Windows XP .
Serious problem should be happened with VISTA

SSL-VPN Gateway Netscreen-SA100 (Juniper).

1. open the designated address
2. Input your ID and PW
3. The window must be appeared after some Add-in installation.
4. Push "start" to connection
5. You can access streaming server after login which located private network.
6. Open <http://192.168.100.10/> to get streaming.

Do not use this system without allowing.

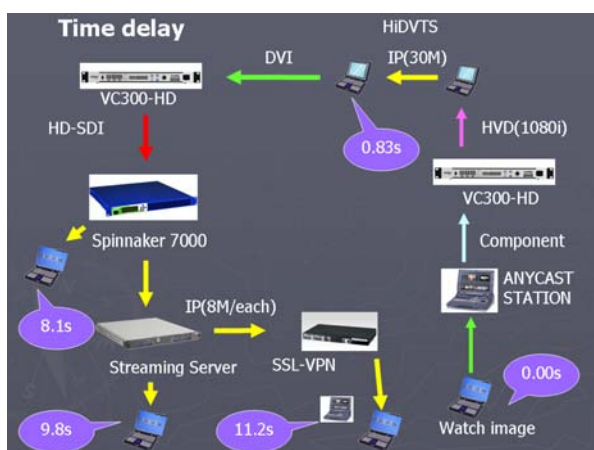
How to get HD stream

1. open <http://192.168.100.10/>
2. Select bit rate from listed below

Temdec HD Transmission demonstration

Select bit rate

8M
4M
2M



Time delay

VC300-HD: 0.03s

HiDVTs: 0.83s

Spinnaker 7000: 7.3s

SSL-VPN (SSL-VPN Plus): 1.7s

Streaming Server: Time delay is depending on number of connection points (4 sec or longer)

Total time delay : 11 sec – over 20 sec

Setting of Spinnaker 7000

Codec: VC-1 (Microsoft, Wikipedia)

Setting detail:

	Bit rate	Pixels	Frame rate	Anamorphic encode
Low	2Mbps CBR	960*720	29fps	Anamorphic encode
Mid	4Mbps CBR	960*720	29fps	Anamorphic encode
Hi	8Mbps CBR	1280*720	29fps	Anamorphic encode

Anamorphic encode
An encoding method for reducing bit rate with anamorphic pixels.
Reference: <http://www.brockbox.com/wiki/AnamorphicGuide>

Encoded stream send to each station through "Windows Media Server" on "Windows Server 2008".

Appearance of each bit rate (subjective evaluation)

2Mbps: Acceptable for still image but mosaic noise is found in active image. This bit rate can use for small screen like note book PC and getting rough image.

4Mbps: Acceptable minimal image quality for conference even though some mosaic nose is found in hard active image. An image detail is quite better than 2M.

8Mbps: The highest bit rate of Spinnaker 7000. It brings realistic and impressive image to us.

Required PC specification for HD stream receiving?

CPU	RAM	Graphic card	8M	4M	2M
Core2Duo Desktop	2G	On board	OK	OK	OK
Dell XPS 710	2G	On board	OK	OK	OK
Pentium D Desktop	2G	On board	OK	OK	OK
Dell dimension 5150C	2G	On board	OK	OK	OK
Pentium4 Desktop	2G	On board	OK	OK	OK
Dell dimension 4700C	2G	On board	OK	OK	OK
Pentium4 Note	750M	Nvidia	NG	OK	OK
Toshiba Dynabook	1G	On board	NG	NG	OK
Atom Netbook	1G	On board	NG	NG	OK

"Decoding task" is an important for HD stream receiving.

A performance for HD stream receiving depends on CPU , Graphic card and other overall performance of PC.

Recommended specification of PC: Note book PC: Core2Duo or higher, Desktop PC: Pentium D or higher.

4. New instruments and technical tips

Result of HD stream receiving

Stations	PC	NW environment	Bit rate 8M	Bit rate 4M	Bit rate 2M
K2RCH	Core2Duo	Flets + OCN	Good	Good	Good
TSF	Core2Duo	KDDI (APAN)	Good	-	Good
Torata Home	Core2Duo	BBTQ	NG	Good	Good
ACI	?		NG		
NTU	?	via commercial line?	NG	NG	NG?
Siriraj	Core2duo	via commercial line?	NG	NG	Good
NUS	?		NG	Good	Good
Tsinghua	?		NG	NG	NG

- Domestic station could receive hi bit rate stream even though using commercial line.

- Difficult to receive HD stream for stations in foreign country.

Summary: Spinnaker 7000

- Compressed HD image has enough quality for conference.
- 4Mbps Bit rate is required for HD stream.
- Required time for HD image encoding is 7 sec. (VC-1 codec).
- Spinnaker 7000 can encode 3 kinds of HD stream (8, 4, 2M) at the same time. (CPU usage 85%, drop frame is found a little)
- H.264 codec can reduce encoding time to 3-4 sec. but another system (Flash Media Server and flash) are required. (will try it next time)

Summary: Streaming Server

Streaming server (Windows Server 2008 bundled)
(Xeon 5430 2.66GHz, RAM 4096 M, Ether port 1G)

- Time delay of streaming server (SS) is not stable. (min. 2-3 sec. Max. 15 sec or more)
- Time delay of each station is not same.
- All stations can see same HD sources but each station's sources are out of sync. (Not see same image at same timing)
- Server kept a few CPU usage during streaming.
- Network usage depended on numbers of connection points and bit rates.
- No debasement was found which is associated with increasing connection points.

Summary: SSL-VPN

- We use default security setting with each SSL-VPN gateway.
- Domestic station could receive hi bit rate stream even though using commercial line.
- Difficult to receive HD stream for stations in foreign country.
- A new work problem which is caused by TCP protocol, exists with connection among distant station in foreign country.
- Compared to performance, SSL-VPN Plus (Allied Telesys) is better than Net Screen SA (Juniper) with this purpose.
- SSL-VPN could be useful for connection in each domestic.
- Difficult to secure enough bandwidth for stations in foreign countries.
- Other solution which can send stream with UDP protocol is required.

Summary: Fresh voice

- Installation is easy for all station.
- Voice is clear. Time delay is 0.5 sec (equal as DVTS peer to peer connection)
- Camera image is not good. (2-3fps)
- Some stations confused with DVTS setup (connect DV camera directly without USB capture cable or special software)
- Because fresh voice shows connected camera image on their local window, it makes difficult for engineers to notice their incorrect connection.
- Audio level monitor and mute button are very useful for sound trouble shooting.
- Auto gain control is included. No need for frequent sound adjustment.
- Build-in echo canceller does not work well currently.

Conclusion

- Image quality of Spinnaker 7000 is very good except for long time delay.
- Streaming Server (SS) is easy to setup but has some problem with their transmission method (RTSP, Http/ TCP, UDP)
- Generally, SS is inadequate for hi-bit rate streaming. Another solution is required to solve this problem.
- SSL-VPN might be useful for connection which has short latency like domestic network.
- Corroboration work among each network administrator is necessary to get best quality of HD stream.

Additional information gathering is needed about streaming system, video transfer system and security system.

An Idea of "new style teleconference" is point for solving time delay problem.

4. New instruments and technical tips

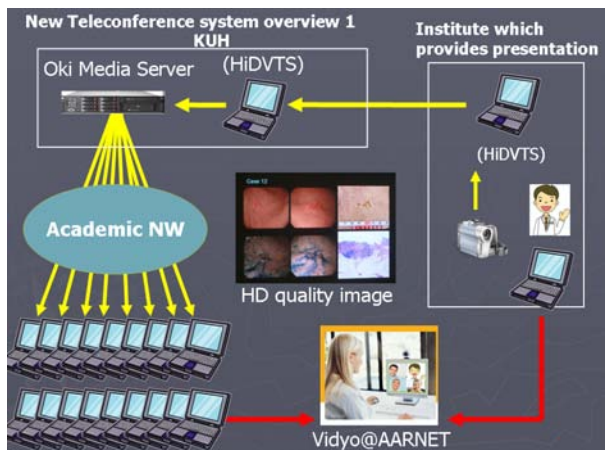
4.7.4.2 2nd demonstration on February 8th, 2010

Event Plan

Date: Feb. 8th (Mon) 16:00-17:00 AEST (GMT+10)
(JP/KR 1400-15:00)

Connecting station

Sydney venue, AU
Kyushu University Hospital, Fukuoka, JP (KUH)
(Recorded operation movie)
Kyoto 2nd Red Cross Hospital, JP (K2RCH)
Seoul National University Bundang Hospital, KR (SNUBH)



New conference system equipment

Transmitting HD image

H.264 real time encoder
(NTT electronics HVE9100)
+ Streaming server
(Oki Media Server)



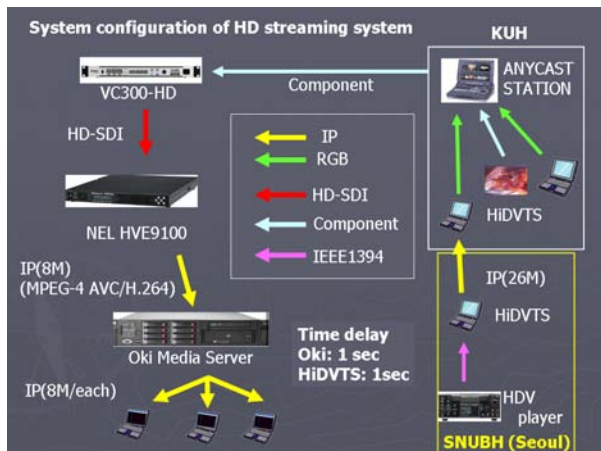
Discussion

Web teleconference system
(Vidyo@ AARNET)



NW security (patient privacy)

Streaming server
(Oki Media Server)



Preparation for teleconferencing

Vidyo (Web conference system)



Sound input device
(Use Mic. input port on PC)
Video device
(Web cam is easy for using)

HD quality streaming (Oki player)



Flat display or projector

Oki Player installation

1. Click Installer file
OKIPlayerV5.50-IPv4-Advance.exe

2. Click the button which circles in red



4. New instruments and technical tips

Usage of Oki Player

- Click Oki player to start application
- Application window detail
- Input a URL into box "A" and push connect button "B". The URL and ID/PW will be informed from KUH staff when we are ready.
- Some items are appeared in box "C" as below if you connect to our server correctly.
- Select "MovieBox" in bon "C" to show more and click "NEL....." for receive testing.
- Quality check
Please check receiving image quality with number of skip frame as the following.
- You can see sample video as below if you connect to server successfully.

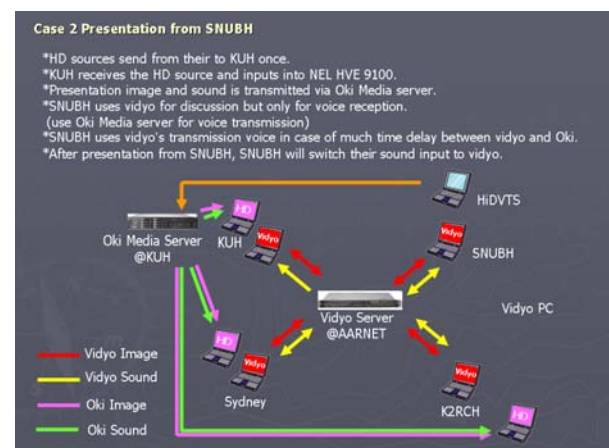
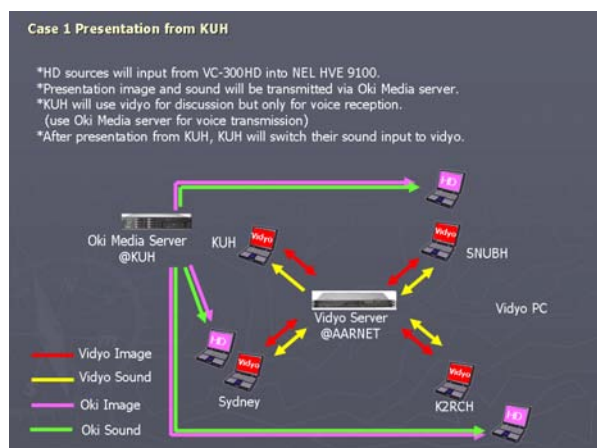
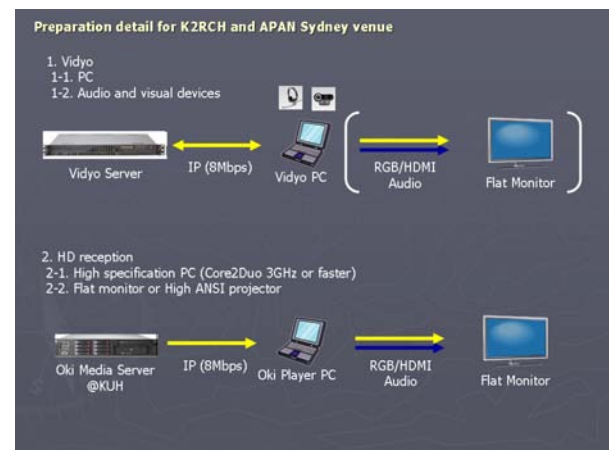
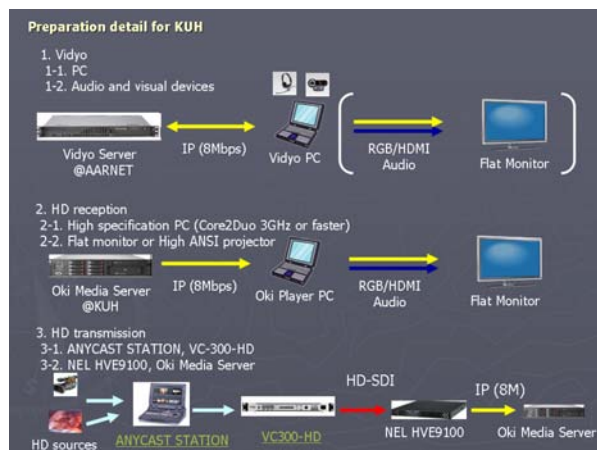
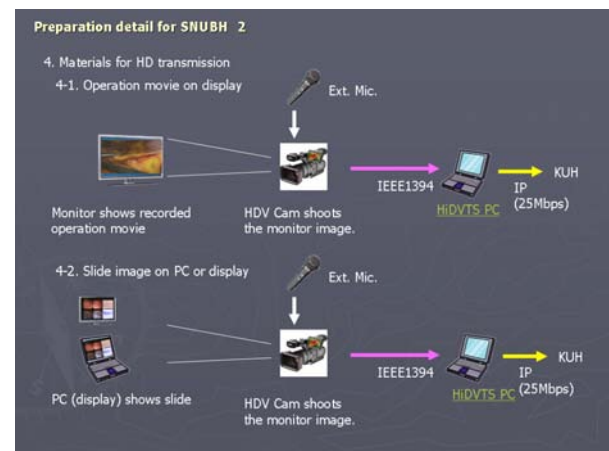
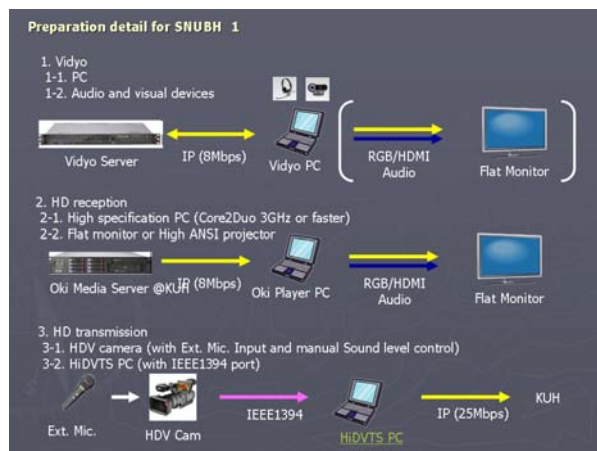
No sound source is included in this video clip.

Number in red box shows total skip frame

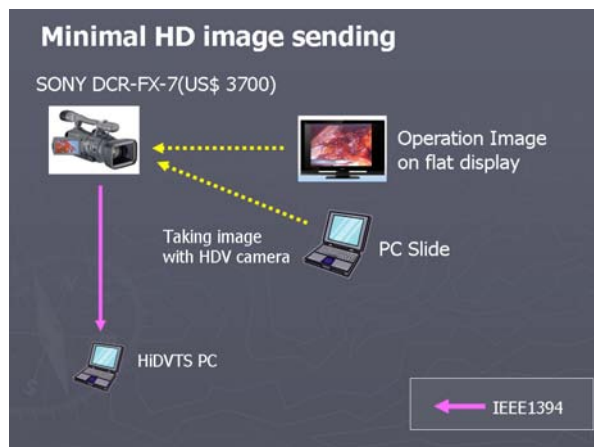
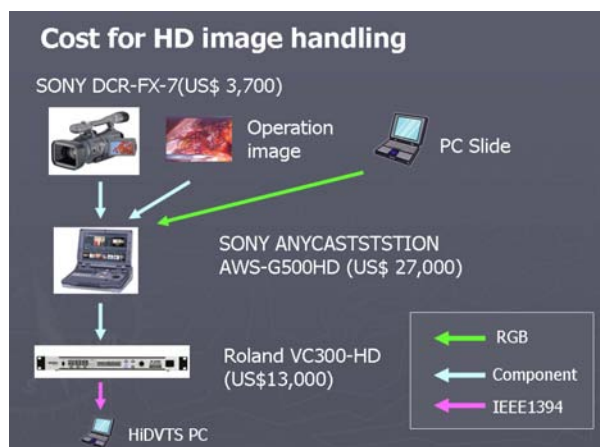
A: Address bar for inputting server address
B: Connect button
C: Server menu window for contents selection
D: Image view window

Usage of Oki Player

Number in red box shows total skip frame



4. New instruments and technical tips



Appendix

1280*720 progressive 60Hz videos with a bit rate of 8Mbps were transmitted in this demonstration.

Conclusion

We have tried to ensure that the new teleconference system combining an OKI Media Server and Vidyo provides adequate performance for our telemedicine activity with a global academic network like APAN. However, we are aware that this system has some problems; that is, a 2 second time delay and limited high definition image handling caused by the visual devices.

Thus, more information needs to be collected and further discussions held.

4.8. Closing

In previous annual reports, information on new instruments and technical tips for each year have been summarized and included in Section 4, "New instruments and technical tips".

From this year, we have changed the aim of this section; that is, to update and supplement previous issues by providing useful information for all engineers. As a result we have added several new documents: "Basic configuration of the VPN router", "DVTs package manual", as well as two more.

We will update this issue with information on not only DVTs setup, but also video conference systems, high definition images, and information sharing systems, in collaboration with engineers all over the world.

(N. Torata)

I believe that having distributed this application to many institutes, we are in a position to host meaningful events.

Thus, we intend establishing more precise skills and using higher-quality technology.

By gathering event information and sharing it, we can distribute the standard technology to each site.

(T. Yamashita)