SRP-X500P

System Integration Guide

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1 Introduction

As a leading manufacturer in the A/V industry, Sony offers a wide range of public address and sound reinforcement products utilizing sophisticated Sony audio, wireless and interfacing technologies to provide a comprehensive business and industrial product line.

In 2002, Sony introduced an innovative all-in-one system concept for multimedia presentations, the SRP-X700P Digital Powered Mixer. Designed to function as the central control hub for the integration of video, audio and PC media sources, this mixer allows for rich content and multimedia presentation systems to be easily configured, without integrating several separate A/V presentation devices. Best suited for use with in mid- to large-scale conference rooms, seminar rooms, and audio-visual rooms, the SPR-X700P is now widely accepted in many different arenas including education, and the corporate and public sectors.

In 2005, expanding on this all-in-one concept, Sony introduced the SRP-X500P. This cost-effective mixer is an ideal choice in small to mid-scale presentation systems that are typically used in conference rooms, corporate boardrooms, classrooms, and houses of worship.

Soon after the launch of the SRP-X500P, however, system integrators and installers were confronted with questions: What is the best choice for a specific application – the SRP-X500P or the SRP-X700P? What are the differences between these two mixers?

To help answer these questions, this guide provides the following useful information:

- Using the maximum functionality and performance of the SRP-X500P
- Understanding the differences between the SRP-X500P and the SRP-X700P
- Establishing an effective system using the key features of the SRP-X500P
- Professional audio terminologies related to the SRP-X500P and SRP-X700P

We hope this guide serves as a valuable asset to your SRP Series system integration activities.

2 Differences Between the SRP-X500P and SRP-X700P

2-1. Features

SRP-X700P

The SRP-X700P Digital Powered Mixer has been designed for multimedia presentation systems that are required to process material from a wide range of sources including microphones, video, audio, DVD players, audio tape recorders, and PCs. It incorporates the functionality of seven major presentation devices – including a video/RGB switcher, audio mixer, wireless tuner slots, sound processor, and two-channel digital power amplifier – in a compact 3U-high chassis. Equipped with a comprehensive remote control capability, and a variety of interfaces, the SRP-X700P can easily be configured into a flexible system, and is an ideal mid- to large-scale presentation system. The main features of the SRP-X700P are as follows:

- Processes and mixes six microphone inputs (4 MIC, 2 MIC/LINE)
  (Audio input CH1/CH2 is compatible with wired and wireless microphones)
- Eight BUS outputs and two REC outputs to configure a large system
- Built-in high-powered two-channel digital power amplifier: 150 W + 150 W (8 Ω)
- Support for 5.1-channel surround audio input/output
- Comprehensive remote control of the SRP-X700P and external peripherals such as a projector via a wide array of interfaces (USB, RS-232C, Parallel, Control S)
- Supplied SRP-X700P User Control Panel software for easy system setup and operation from a PC

SRP-X500P

Inheriting rich features from the SRP-X700P, the SRP-X500P provides a cost-effective solution and is ideal for use in small to mid-scale presentation systems. For smooth control over presentations, there is an easy-to-use front-panel layout, providing instant-access controls. A built-in four-channel power amplifier eliminates the need for additional power amplifiers, enhancing the all-in-one system concept.

The SRP-X500P offers nine system presets (factory default system settings) in its memory, enabling quick setup of the audio system by recalling the one best suited for each venue. The main features of the SRP-X500P are as follows:

- Processes and mixes four microphone inputs
  (Audio input CH1/CH2 is compatible with wired and wireless microphones)
- Built-in four-channel digital power amplifier:
  90 W + 90 W + 50 W + 50 W (8 Ω)
- Nine system presets stored in memory – allows simple system configuration
- Easy-to-use front-panel layout with hardware switches for projector controls and feedback reducer function
- Supplied front cover to prevent accidental operation

SRP-X700P (two optional tuner units installed)

SRP-X500P (two optional tuner units installed)

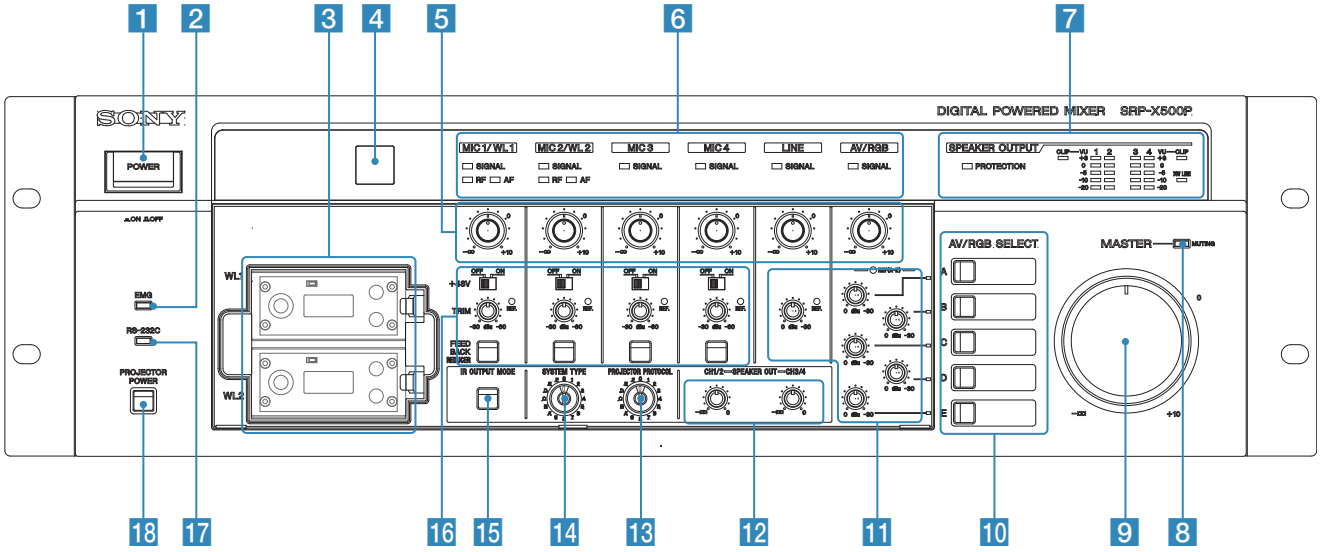
2-2. Comparison Chart

		SRP-X500P	SRP-X700P
Power amplifier	Low-impedance (8 Ω)	90 W x2 + 50 W x2	150 W x2
	70V LINE	60 W, Mono	150 W, Mono
5.1CH IN/OUT		N/A	Yes
VIDEO IN/OUT	RGB IN/OUT	2 IN/1 OUT	3 IN/1 OUT
	Component switching	Yes	Yes
	S-VIDEO IN/OUT	N/A	3 IN/1 OUT
	VIDEO IN/OUT	3 IN/1 OUT	3 IN/1 OUT
AUDIO IN	MONO	4	6
	TRIM (MONO)	-60 dBu to -30 dBu	-60 dBu to -45 dBu
	STEREO	2	2
	TRIM (STEREO)	-30 dBu to 0 dBu	-10 dBu to 0 dBu
	AV SELECT	5	6
AUDIO OUT	Master	4	8
	REC OUT (L/R)	N/A*	Yes
GUI (setting software)		Yes (RS-232C)	Yes (USB)
Settings	System preset	Yes (selectable from front panel)	N/A
	Routing	Yes	Yes
	Feedback reducer	Yes	Yes
	Comp./Limiter	Yes	Yes
	Parametric equalizer	Yes (IN/OUT)	Yes (IN/OUT)
	Delay	Yes	Yes
	Automatic mixer	N/A	Yes
	Automatic Gain Control (AGC)	Yes	N/A
Projector control		Yes	Yes
PROJECTOR POWER ON/STANDBY switch		Yes (front panel button)	Yes (using SCENE RECALL)
IR remote control		Yes (optional)	N/A
External AV transport control		No (use optional remote controller)	Yes (4 Control S ports supplied)
SCENE RECALL		Yes (via parallel port or RS-232C)	Yes (via front panel switches, parallel port, and RS-232C)

* LINE OUTPUT CH-3/-4 is set to REC OUT in factory default settings.

3 Panel View

3-1. Front Panel



1 POWER switch
Turns the SRP-X500P on and off.
With the SRP-X500P Manager software, you can link projector or display monitor power on/standby control to that of the SRP-X500P. For more details, refer to the Projector Control section (5-4.).

2 EMG (emergency) indicator
Lights up red when an emergency broadcast system connected to the REMOTE PARALLEL connector cuts the SPEAKER and LINE outputs.

3 Wireless microphone slots (WL1/WL2)
Accommodates up to two WRU-806A/806B (not supplied) or URX-X1 tuner module (not supplied) included in the UWP-X1/X2.

4 Remote emitter/sensor
Point an optional remote commander towards the emitter/sensor. Using an optional learning-type IR remote controller, you can wirelessly control frequently accessed SRP-X500P and connected projector operations. For more details, refer to Programming a Learning-type Remote Commander in the appendix.

5 Input level controls
Rotate to adjust the input signal level:
MIC1/WL1: Adjusts the level of the signal input from the MIC INPUT 1 connector or the tuner unit installed in the WL1 slot.
MIC2/WL2: Adjusts the level of the signal input from the MIC INPUT 2 connector or the tuner unit installed in the WL2 slot.
MIC3: Adjusts the level of the signal input from the MIC INPUT 3 connector.
MIC4: Adjusts the level of the signal input from the MIC INPUT 4 connector.
LINE: Adjusts the level of the signals input from the LINE IN connectors.
AV/RGB: Adjusts the level of the signals input from the AV/RGB INPUT audio connectors, as specified by the 10 AV/RGB SELECT buttons.

6 Input indicators
SIGNAL (signal level) indicators: Lights up green when the signal is input from each audio connector.
RF (radio frequency) indicators: Lights up green when the level of the RF signal input from each tuner unit is satisfactory.
AF (audio frequency) indicators: Light up yellow when the signal is input from each tuner unit.

7 SPEAKER OUTPUT indicators
PROTECTION (protection circuit) indicator: Lights up red when the protection circuit of the internal power amplifier is activated.
CLIP (clip) indicators: Lights up red when the output level of the internal power amplifier is excessive and the output signal is distorted.
70V LINE (high-impedance speaker connection) indicator: Lights up green when the SPEAKERS CH-3/4 terminals are set to connect high-impedance speakers (70V LINE).
VU (volume unit) meters: Uses five-segment LEDs to indicate the signal output level prior to adjustment by the 12 SPEAKER OUT controls.

8 MASTER MUTING indicator
Lights up red when signal output is muted by a command from a device connected to the REMOTE PARALLEL or REMOTE RS-232C connector, or by operation of an optional remote commander.

9 MASTER control
Adjusts the output level of the assigned channels. With the SRP-X500P Manager software, you can specify which output channels are controlled by the MASTER control. In the factory-preset setting, the MASTER control is assigned to control output from the SPEAKERS CH-1 to 4 terminals and the LINE OUTPUT 1/2 connectors. (Note that the output from the LINE OUTPUT 3/4 terminals cannot be controlled. However, by using SRP-X500P Manager software, settings can be customized to allow LINE OUTPUT 3/4 connectors to be controlled by the MASTER control and/or the REMOTE PARALLEL connector.)

10 AV RGB SELECT buttons (A to E)
Press to select a device connected to the AV/RGB INPUT audio/video connectors. The pressed button lights up green.

11 LINE AV/RGB input adjustment section
TRIM (input reference level adjustment) controls: Adjusts the reference level for the audio signals input from the LINE IN connectors and the AV/RGB INPUT audio connectors. The adjustable range is -30 dBu to 0 dBu.
REF. (reference level) indicators: Lights up yellow when an audio signal with a level in excess of the reference level is input to the LINE IN connectors and the AV/RGB INPUT audio connectors. While the audio signal is input, adjust the TRIM controls so that the REF. indicators light up yellow intermittently.

12 SPEAKER OUT controls
Used to attenuate the output level of the internal power amplifier. Before adjusting the speaker output level, use the TRIM controls to specify the reference level for the audio input signals, then use the MASTER control to adjust the overall level. And then use the SPEAKER OUT controls to adjust output levels from the SPEAKERS CH-1/2 terminals and CH-3/4 terminals.

13 PROJECTOR PROTOCOL selector
Used to select the protocol corresponding to the model of the projector or display monitor connected to the PROJECTOR CONTROL RS-232C connector or the CONTROL S IN/OUT connectors. For control of an LCD Data Projector VPL-PX15, use the CONTROL S connectors.

14 SYSTEM TYPE selector
Select 1 to 9 according to the speaker configuration of the AV system being used. The setting becomes effective next time the power is turned on. For more details, refer to the SYSTEM TYPE section (4-1.).

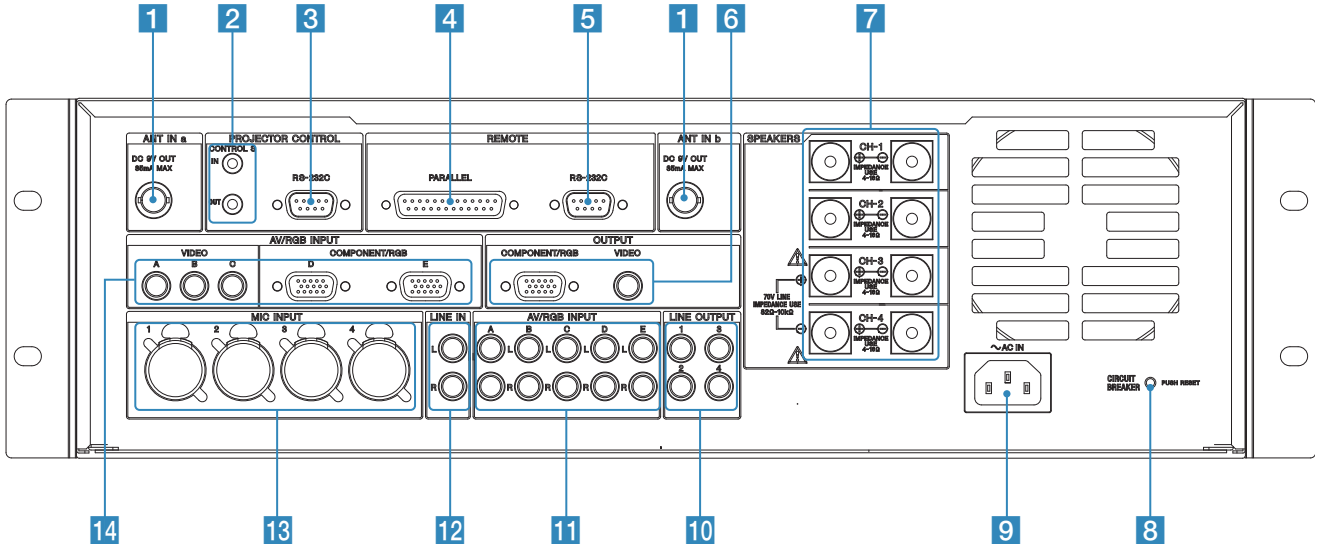
15 IR OUTPUT MODE (remote programming) button
Used to program an SRP-X500P command to an optional learning-type remote commander. For more details, refer to Programming a Learning-type Remote Commander in the appendix.

16 Microphone input adjustment section
+48V (48 V DC power supply) ON/OFF switches: Set to ON to supply 48 V DC power to condenser microphones connected to the MIC INPUT 1 to 4 connectors. Before turning these switches, be sure to fully turn down all input level controls and the LINE AV/RGB controls, or turn off the unit.
TRIM (microphone input reference level adjustment) controls: Set the reference level for signals input from the MIC INPUT 1 to 4 connectors. The adjustable range is -60 dBu to -30 dBu.
REF. (reference level) indicators: Lights up yellow when an audio signal with a level in excess of the reference level is input to the MIC INPUT 1 to 4 connectors. While the audio signal is input, adjust the TRIM controls so that the REF. indicators light up yellow intermittently.
FEEDBACK REDUCER (howling suppressor) buttons: Used to turn the howling noise reducing function on or off, and to make settings for this function. The buttons light up green when the function is turned on. For more details, refer to the Feedback Reducer section (4-2.).

17 RS-232C indicator
Lights up green when the SRP-X500P and a PC or external controller are communicating via the REMOTE RS-232C connector.

18 PROJECTOR ON/STANDBY POWER switch
Turns on the projector or display monitor connected to the SRP-X500P, or sets the projector to standby status. Press the switch while it is lit up red (i.e., the projector is in standby) to turn on the projector. The switch lights up green when the projector is turned on. To turn off the projector, hold down the switch for more than two seconds. The switch flashes green while the projector cools off, and then lights up red when the projector enters standby.

3-2. Rear Panel



1 ANT IN a/b connectors (BNC-type)

Connect antennas for the tuner unit installed in the SRPX-500P. Only the supplied antennas or the optional UHF Antenna AN-820A can be used.

2 PROJECTOR CONTROL CONTROL S IN/OUT connectors (stereo mini jack)

Used to control the LCD Data Projector VPL-PX15 exclusively.

3 PROJECTOR CONTROL RS-232C connector (D-sub, 9-pin, male)

Used to control a projector or display monitor with an RS-232C connector that is connected to the 6 OUTPUT COMPONENT/RGB or OUTPUT VIDEO connector of the SRP-X500P.

4 REMOTE PARALLEL connector (D-sub, 25-pin, female)

This connector consists of 10 input pins and 10 output pins. The SRP-X500P can be controlled by a switch or volume controller connected to the input pins. Connecting these pins to an emergency broadcast system allows the audio output of the SRP-X500P to be cut off during an emergency broadcast.

The following devices can be connected to this connector:

Input pins

Connectable device	
Switch	-
Volume	With 10 kΩ, B-curve
Emergency broadcast system	Connected via relay

Output pins

Connectable device	
LED	24 V DC or less, 40 mA or less
Relay	24 V DC or less, 40 mA or less

5 REMOTE RS-232C connector (D-sub, 9-pin, male)

This is an RS-232C serial connector for remote control. When a PC is connected, parameters can be set using the SRP-X500P Manager software. The SRP-X500P can be controlled from the external controller connected to the REMOTE RS-232C connector.

6 OUTPUT connector section

These connectors output the video signal input from the AV/RGB INPUT video connectors. Signal format conversion is not carried out.

COMPONENT/RGB connector (HD D-sub, 15-pin, female): Outputs component or RGB signals.

VIDEO connector (phono jack): Outputs composite signals.

7 SPEAKERS CH terminals (1 to 4) (screw terminal)

These are the output terminals of the internal power amplifiers. For more details, refer to Connecting High-impedance Speakers/Low-impedance Speakers in the appendix.

8 CIRCUIT BREAKER button

The circuit breaker cuts off the main power when excessive current flows through the AC IN connector. If the circuit breaker trips, press the CIRCUIT BREAKER button to reset the breaker, but do not use the SRP-X500P. Instead, turn it off and contact the Sony dealer from whom you purchased the unit.

9 AC IN connector

Connects the supplied AC power cord.

10 LINE OUTPUT connectors (1 to 4) (phono jack)

Connect to the line input connectors of a power amplifier, CD/MD recorder, etc. The LINE OUTPUT 3/4 is set to REC OUT in factory default settings. SRP-X500P Manager software settings can be changed in order to use LINE OUTPUT 3/4 connectors for other purposes.

11 AV/RGB INPUT audio connectors (A to E) (phono jack)

Connect to the audio output connectors of devices with video output connection to SRP-X500P 14 AV/RGB INPUT video connectors. When connecting a device, be sure that each output connector on the device is connected to the AV/RGB INPUT video and audio connector on the SRP-X500P with the corresponding letter (A to E).

12 LINE IN connectors (phono jack)

Connect to the line output connectors of a CD player, MD recorder, etc.

13 MIC INPUT connectors (1 to 4) (XLR-3-31-type)

Connect wired microphones. When wired microphones are connected to the MIC INPUT 1/2 connectors, input signals from the wireless microphones take priority from the moment the tuner units begin receiving the signal.

14 AV/RGB INPUT video connectors (A to C: phono jack; D and E: HD D-sub, 15-pin, female)

Connect to the video output connectors of devices with audio output connection to SRP-X500P 11 AV/RGB INPUT audio connectors. When connecting a device, be sure that each output connector on the device is connected to the AV/RGB INPUT video and audio connector on the SRP-X500P with the corresponding letter (A to E).

4 Setting up the SRP-X500P

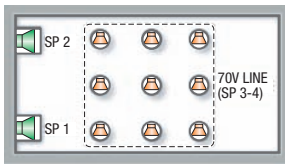
4-1. SYSTEM TYPE

What is a “SYSTEM TYPE”?

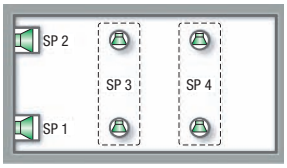
The SRP-X500P offers nine factory default system settings called “SYSTEM TYPE” in its memory, enabling efficient audio adjustment. Depending on the type of room, speaker locations, and speaker system configurations, you can quickly configure an audio system by recalling the best-suited preset for each venue. If your requirements cannot be managed by one of the nine system presets provided, you can easily customize all system settings using the supplied SRP-X500P Manager software.

AV Presentaion Room

SYSTEM TYPE 1 (70V LINE)

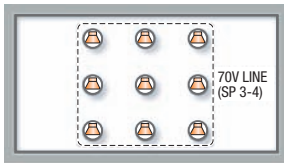


SYSTEM TYPE 2 (Lo-imp)

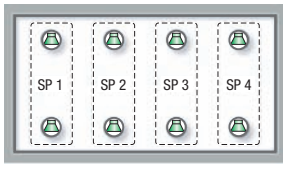


Conference Room

SYSTEM TYPE 4 (70V LINE)



SYSTEM TYPE 5 (Lo-imp)



Audio-Visual Room

SYSTEM TYPE 3

SYSTEM TYPE 6 to 9

SYSTEM TYPE 1, 2 (for AV Presentation Rooms)

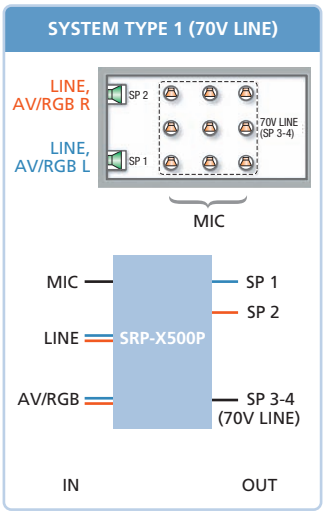
SYSTEM TYPE 1 and 2 are suitable for AV presentation rooms. This type of room needs clear voice reproduction from microphones, and vivid sound from AV equipment such as DVD and CD players. Satisfying both requirements, the following may be the best speaker configuration:

- Output microphone audio from ceiling speakers to enhance clarity
- Output AV equipment audio from the front speakers in stereo

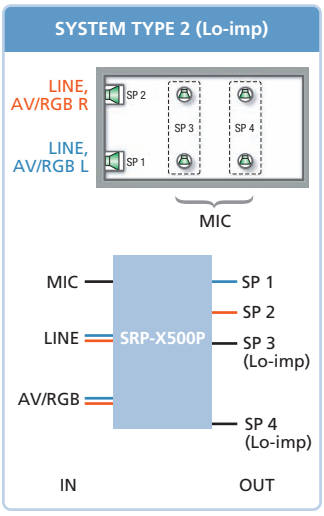
For ceiling speakers, both multi-connected high-impedance speakers and high-quality low-impedance speakers can be used.

The SRP-X500P is equipped with a four-channel digital power amplifier (SP1 to SP4). Low-impedance speakers can be connected to SP1 and SP2, while SP3 and SP4 can be switched between high- and low-impedance modes. This means you can configure systems as follows:

- SYSTEM TYPE 1: a pair of front speakers and high-impedance ceiling speakers (70V Line)
- SYSTEM TYPE 2: a pair of front speakers and low-impedance ceiling speakers (Lo-imp)



When using high-impedance ceiling speakers



When using low-impedance ceiling speakers

SYSTEM TYPE 4, 5 (for Conference Rooms)

SYSTEM TYPE 4 and 5 are well suited for conference rooms. This type of room mainly needs clear voice reproduction from microphones. In these rooms, the speaker system consists of ceiling speakers. Audio from AV sources is mixed to monaural, and is output from all power amplifiers (SP1 to SP4).

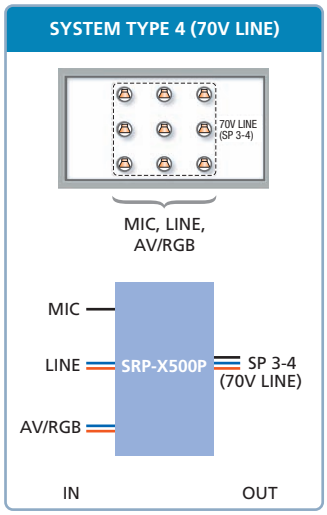
- SYSTEM TYPE 4 uses only SP3 and SP4 outputs, and consists of high-impedance ceiling speakers (70V LINE)
- SYSTEM TYPE 5 uses all outputs from SP1 to SP4, and consists of low-impedance ceiling speakers (Lo-imp)

SYSTEM TYPE 3, 6, 7, 8, 9 (for Audio-Visual Rooms)

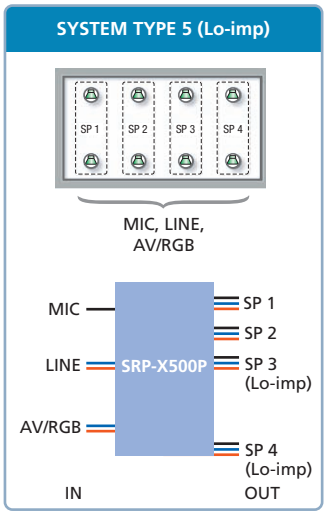
SYSTEM TYPE 3, 6, 7, 8, and 9 settings are suitable for audio-visual rooms. This type of room mainly needs vivid audio reproduction from AV equipment such as DVD and CD players. In these rooms, ceiling speakers are not used. Audio from microphones is output from front speakers and satellite speakers. So, speaker output should be adjusted to be heard evenly anywhere in the room.

In a long length audio-visual room, locating satellite speakers in the middle of the room is an effective way of maintaining sufficient sound pressure at the rear of the room, while suppressing excessive sound pressure close to the speakers. SYSTEM TYPE 6 to 9 settings fit such rooms, and are selected depending on the distance between front speakers and satellite speakers.

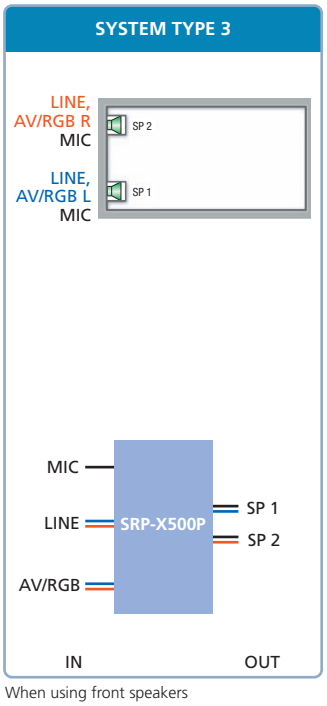
By adding delay to satellite speakers according to their distance from front speakers, users can compensate for audio delay, allowing clear audio reproduction throughout the room. For more details on the delay feature, please refer to the appendix.



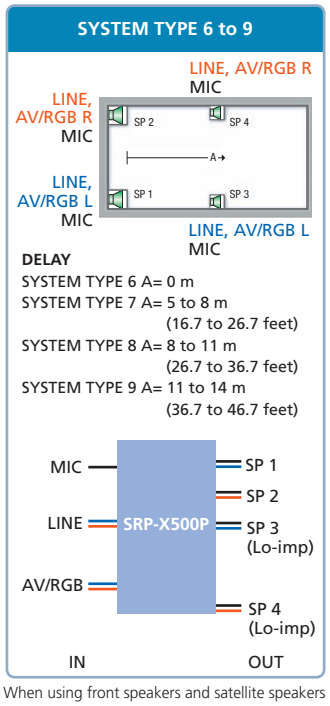
When using high-impedance ceiling speakers



When using low-impedance ceiling speakers



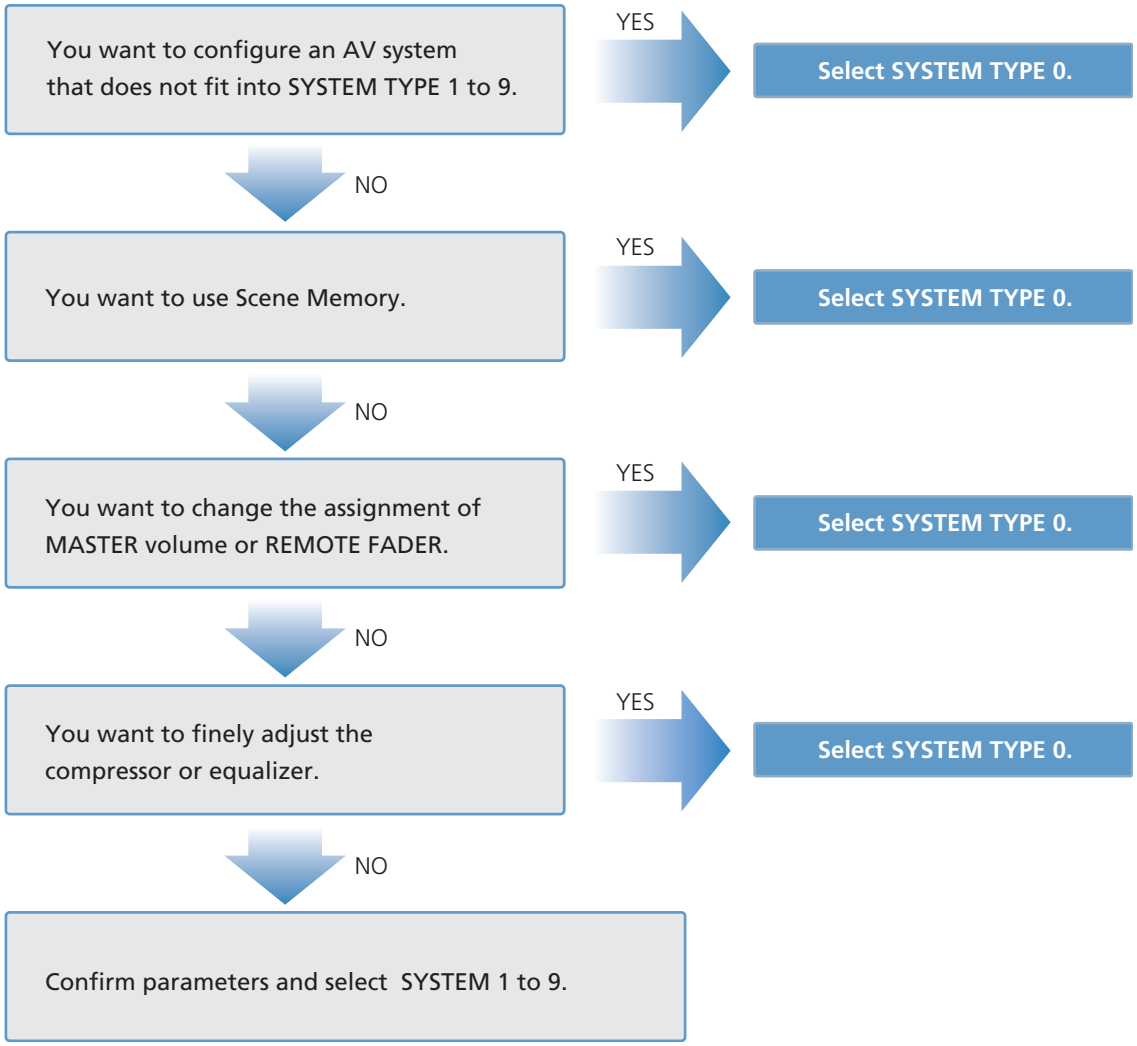
When using front speakers



When using front speakers and satellite speakers

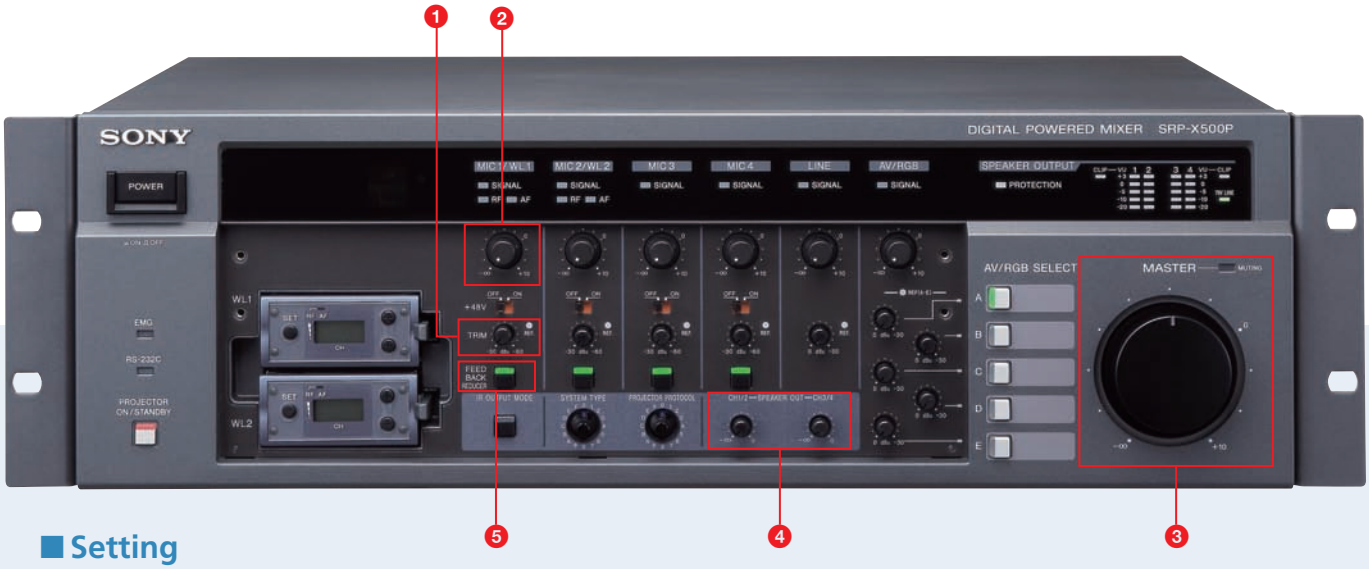
SYSTEM TYPE 0

SYSTEM TYPE 0 is selected to customize system settings. If your application does not fit the description of SYSTEM 1 to 9 environments, or if you prefer to individually adjust various SRP-X500P functions, users can select SYSTEM TYPE 0 and set the parameters using the supplied Manager software. This chart explains when SYSTEM TYPE 0 should be selected:



4-2. Feedback Reducer

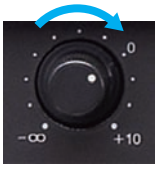
The SRP-X500P is equipped with an independent feedback reducer function on each microphone channel, helping to achieve optimum sound quality. In multimedia presentation systems, it's not unusual for microphones to be located within the speaker coverage area (sometimes in front of a speaker), and howling may occur when the distance between a speaker and microphone is too close. In the past, howling has been typically suppressed by making repeated manual adjustments to a graphic equalizer, but this manual operation takes a long time as the user must detect the frequency bands in which howling occurs. Now, with the SRP-X500P, howling is easily and quickly suppressed by the built-in feedback reducer function. For an explanation of howling, please refer to the appendix.



■ Setting

❶ Adjust the TRIM volume while talking on a wired microphone, or adjust the audio attenuator on the transmitter while talking on a wireless microphone, so the REF indicator lights up intermittently.

❷ Set the INPUT LEVEL to the 0 dB position.



❸ Set the MASTER volume to the 0 dB position.

❹ Turn up the SPEAKER OUT volume slowly until speaker output reaches the appropriate level from anywhere in the room.

❺ Hold down the FEEDBACK REDUCER button for two seconds or more. The indicator flashes during scanning of the frequency band. Setting is complete once the flashing stops.

5 Setting up the SRP-X500P Using Manager Software

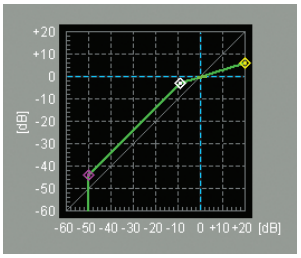
5-1. Automatic Gain Control (AGC)

It is often difficult to appropriately adjust microphone volumes when picking up voice. This is because speaking volumes differ from person to person, and depend on the distance between each presenter's mouth and the microphone. The Automatic Gain Control (AGC) function is convenient for maintaining an optimum audio level by reducing speech volume differences. AGC can be set using the supplied SRP-X500P Manager software. For more details on AGC, refer to the appendix.

AUTO GAIN CONTROL Setting Screen

Setting

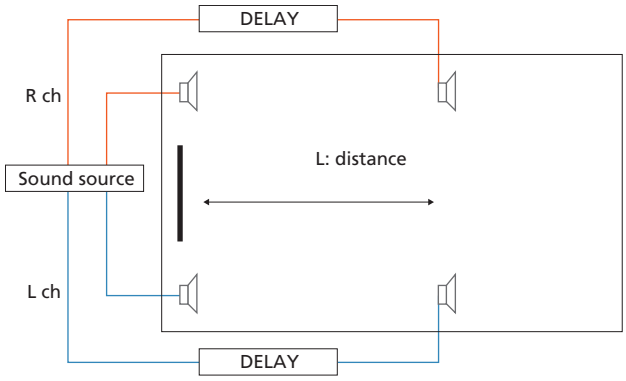
1. Set the overall audio volume. The speaker output level should be adjusted beforehand so that the audio can be heard evenly anywhere in the room.
2. Set the AGC to ON. Left click the AGC button on the OVERVIEW screen to display the AUTO GAIN CONTROL setting screen. Click the ON button to turn on the AGC function.
3. Initially set the GATE THRESHOLD level to -50 dB.
4. Adjust the COMPRESSOR THRESHOLD level so that the GAIN CONTROL meter reads between -5 and -10 dB when talking on a microphone in a loud voice. At the same time, adjust the RATIO so that the voice can be clearly heard. As a rough guideline, set it between 3:1 and 10:1.
5. Adjust the MAKE GAIN so that the compressor characteristics line is at 0 dB IN/0 dB OUT.



6. Adjust the GATE THRESHOLD level so that the gate does not open with the ambient noise level present during a presentation.
7. Adjust the RANGE level so that the ambient noise is not completely muted. At the same time, confirm that the gate opens when you talk into the microphone. If you lower the volume too much, the timing to open the gate will be delayed when you talk on the microphone. This may cause a momentary microphone off when starting to speak.
8. Adjust the ATTACK, HOLD, and RELEASE times.
   ATTACK time means the response time when the gate opens or the compressor works. As a rough guideline, set it to 50 ms or less.
   HOLD time suppresses the rapid change of gain by maintaining the condition of the gate and compressor. 10 ms to 100 ms may be a suitable value. If you want to eliminate any unnatural sound that may occur for a short duration just after talking, set a short HOLD time value. If the gate closes between words while speaking, set a longer value.
   RELEASE time is the response time it takes from the gate opening and closing, the compressor stopping, and the gain returning to normal. 100 ms to 300 ms may be an appropriate value. If the level rapidly changes and the voice is interrupted, set a longer RELEASE time. If you are worried about the noise made by the gate closing, set a shorter time.
9. Setting is now complete, so close the AGC screen.

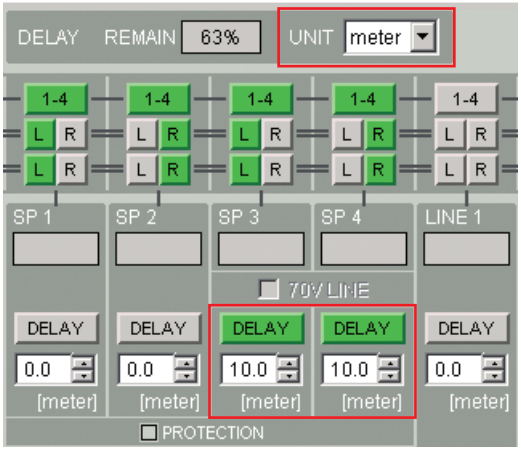
5-2. Delay

The SRP-X500P is equipped with a four-channel power amplifier. By utilizing all amplifiers, you can configure a multiple speaker system with the SRP-X500P. When you select SYSTEM TYPE 0 to configure your audio-visual room, a delay setting is required to compensate for the distance between front speakers and satellite speakers. Delays can be set on the OVERVIEW screen of the supplied SRP-X500P Manager software.

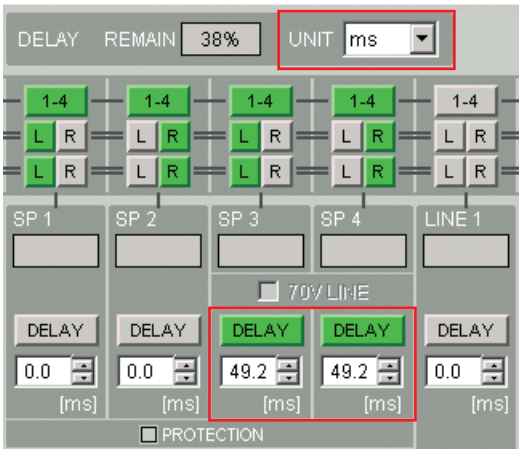


Setting

1. Measure the distance between the main speakers and the satellite speakers (e.g. 10 m).
2. Select meters or feet from the drop-down list in the UNIT setup box. Then input the value in the SP3 and SP4 DELAY boxes.
3. By setting the delay parameter a little longer than the actual measurement, you can get more natural audio from front speakers. Select ms from the drop-down list in the UNIT setup box. Then add 10 to 20 ms to the SP3 and SP4 DELAY value (e.g. 20 ms).
4. Listen to the audio. If it sounds normal, the setting is complete.



If you find the audio from the front speakers and satellite speakers is not unified, the delay parameter is too great. Reduce its value gradually, and check by listening. If sound is located at the mid-point between the left and right satellite speakers, the delay parameter is too small. Increase its value gradually.



5-3. Parallel Remote

When the SRP-X500P is installed in a presentation room, the external control panel can be used to remotely control AV equipment.

The PARALLEL REMOTE interface on the rear panel of the SRP-X500P allows remote control of peripherals from the external control panel using switches and volume controls.

Connectable Devices to PARALLEL REMOTE Input Pins

The following types of device can be connected to the PARALLEL REMOTE:

- **Toggle Switch**
  The toggle switch is an electric switch operated by pushing a latching-type lever. Pressing it once turns the circuit on, and pressing it again turns the circuit off. The toggle switch controls:
  - Muting
  - PROJECTOR POWER ON/STANDBY
- **Push Switch (momentary-type)**
  Press the push switch to turn on the circuit. The push switch controls:
  - Input signal selection for the AV/RGB INPUT
  - MASTER VOLUME UP
  - MASTER VOLUME DOWN
  - SCENE RECALL
  - PROJECTOR POWER ON
  - PROJECTOR POWER STANDBY
- **Control Volume**
  The control volume is used to adjust REMOTE FADER. Select the control volume with a 10 kΩ B curve. This can be used to remotely control the volume of REMOTE FADER LEVEL.

MASTER Volume Muting

The following is an example of muting MIC1 to MIC4 together assigned to the MASTER volume, using a toggle switch.

Setting

1. Connect a toggle switch to INPUT 1 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Click MIC1 to MIC4 in the MASTER line on the REMOTE FADER screen (Fig. 1).
3. Select MASTER VOLUME MUTING on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1 (Fig. 2).

Status

The relationship between the switch position and the muting status is as follows (Fig. 3):
- Pressing the switch once mutes the MASTER volume.
- Pressing the switch once again releases the muting of the MASTER volume.

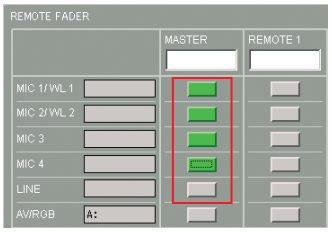


Fig. 1 REMOTE FADER Screen

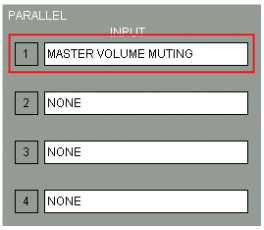


Fig. 2 MASTER VOLUME MUTING Screen

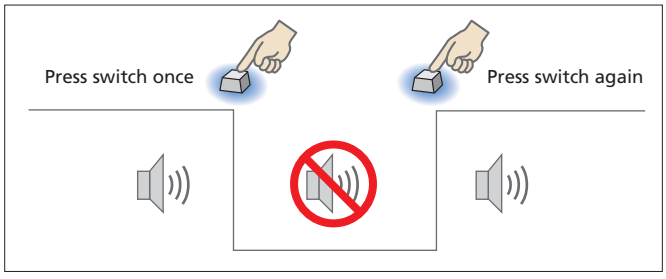


Fig. 3 Muting Status

PROJECTOR POWER ON/STANDBY (1)

The following is an example of controlling PROJECTOR POWER ON/STANDBY using a toggle switch.

Setting

1. Connect a toggle switch to INPUT 1 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Select PROJECTOR POWER ON/STANDBY on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1 (Fig. 4).

Status

The relationship between the switch position and the projector power status is as follows (Fig. 5):

- Pressing the switch once turns on projector power.
- Pressing the switch once again sets projector power to standby mode.

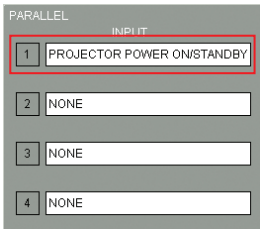


Fig. 4 PARALLEL/PROJECTOR CONTROL Screen

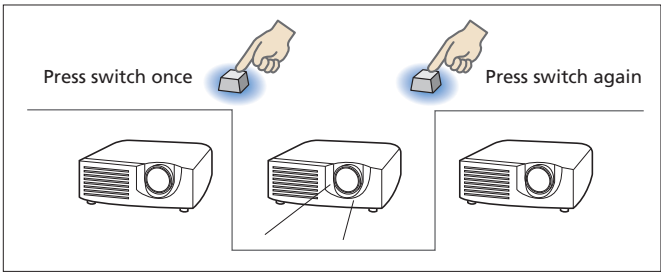


Fig. 5 Projector POWER ON/STANDBY Status

PROJECTOR POWER ON/STANDBY (2)

The following is another example of controlling PROJECTOR POWER ON/STANDBY using two push switches.

Setting

1. Connect two push switches to INPUT 1 and INPUT 2 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Select PROJECTOR POWER ON on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1. Then select PROJECTOR POWER STANDBY on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 2 (Fig. 6).

Status

The relationship between the switches and the projector power status is as follows (Fig. 7):

- Pressing the switch assigned to INPUT 1 turns on projector power.
- Pressing the switch assigned to INPUT 2 sets projector power to standby mode.

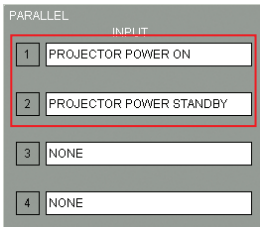


Fig. 6 PARALLEL/PROJECTOR CONTROL Screen

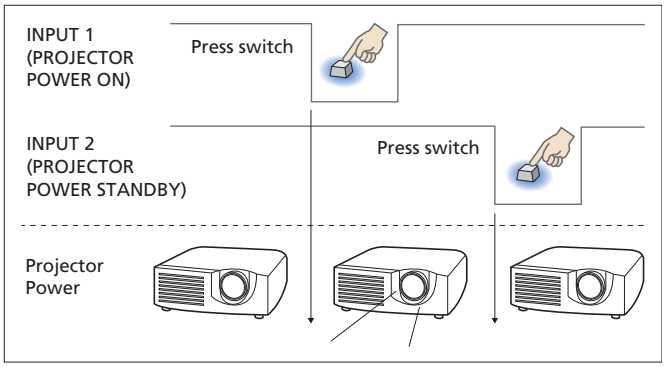


Fig. 7 Switch and Projector Power ON/STANDBY Status

Input Signal Selection for the AV/RGB INPUT Connector

The following is an example of selecting input signals to the AV/RGB SELECT A to C using three push switches.

Setting

1. Connect three push switches to INPUT 1, INPUT 2, and INPUT 3 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Select AV/RGB SELECT A on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1. Select AV/RGB SELECT B on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 2. And then select AV/RGB SELECT C on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 3 (Fig. 8).

Status

The relationship between the switches and the input signals is as follows (Fig. 9):

- Press to select one of the devices connected to the AV/RGB INPUT connector.

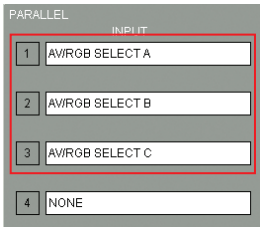


Fig. 8 Setting of the PARALLEL REMOTE

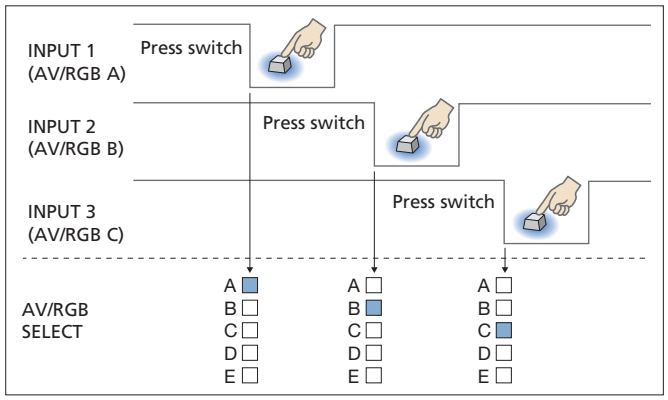


Fig. 9 Switch and AV/RGB SELECT Status

MASTER Volume Control

The following is an example of raising or lowering the MASTER volume using two push switches.

Setting

1. Connect two push switches to INPUT 1 and INPUT 2 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Select MASTER VOLUME UP on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1. Then select MASTER VOLUME DOWN on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 2 (Fig. 10).

Status

The relationship between the switches and the input signals is as follows (Fig. 11):

- Pressing the switch raises or lowers the MASTER volume.

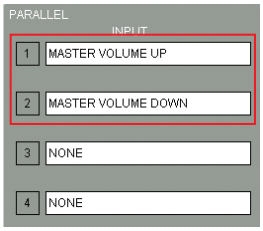


Fig. 10 Setting of the PARALLEL REMOTE

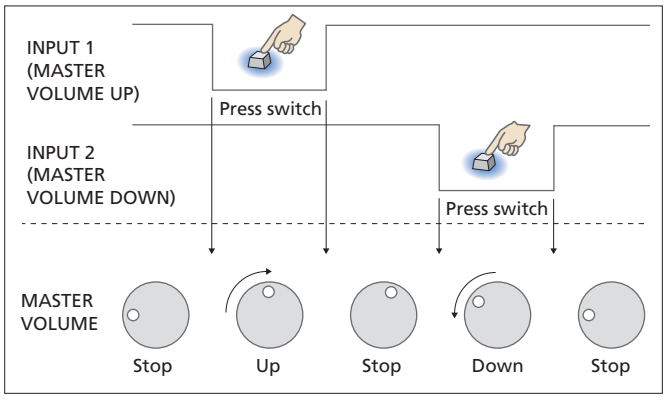


Fig. 11 Switch and MASTER VOLUME Status

Scene Recall

The following is an example of recalling SCENE No.1 and SCENE No.2 using two push switches.

Setting

1. Connect two push switches to INPUT 1 and INPUT 2 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Select SCENE RECALL No.1 on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1. Then select SCENE RECALL No.2 on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 2 (Fig. 12).

Status

The relationship between the switches and scene recall is as follows (Fig. 13):

- Press the switch to recall the relevant scene memory.

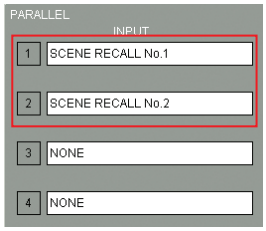


Fig. 12 Setting of the SCENE RECALL

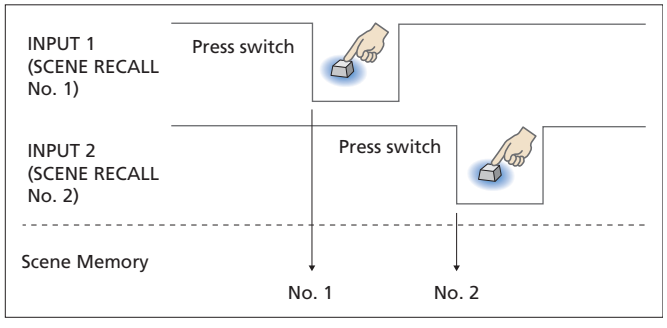


Fig. 13 Switch and SCENE RECALL Status

Remote Fader Level Control

The following is an example of controlling the level of MIC1 to MIC4 using the remote fader control volume.

Setting

1. Connect a control volume to INPUT 1 of the PARALLEL REMOTE connector on the SRP-X500P.
2. Click MIC1 to MIC4 in the REMOTE1 line on the REMOTE FADER screen (Fig. 14).
3. Select the REMOTE FADER1 LEVEL on the PARALLEL/PROJECTOR CONTROL screen. This selection appears on a drop-down list on INPUT 1 (Fig. 15).

Operation

By rotating the volume control, the user can adjust the channel volume assigned to the remote fader. The adjustable range is between -∞ and 0 dB. The total volume level is the combination of MIC INPUT volume on the front panel and REMOTE FADER volume. If MIC INPUT volume on the front panel is set to -10 dB, the total volume level is as illustrated in Fig. 16.

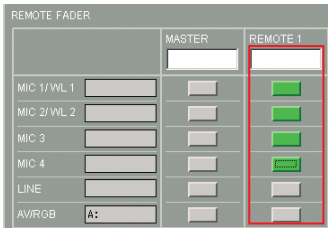


Fig. 14 REMOTE FADER Screen

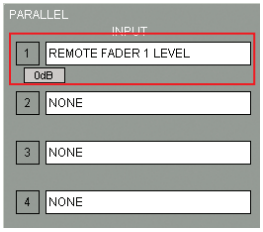


Fig. 15 REMOTE FADER Setting

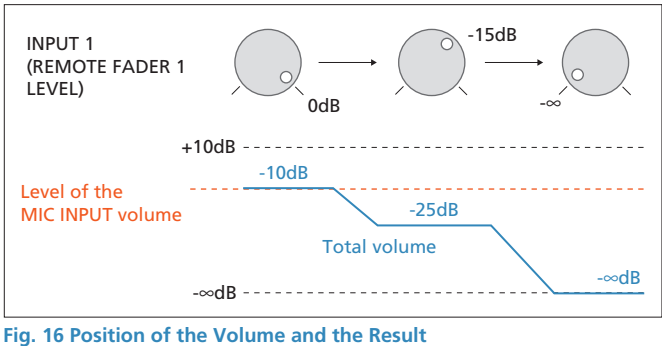


Fig. 16 Position of the Volume and the Result

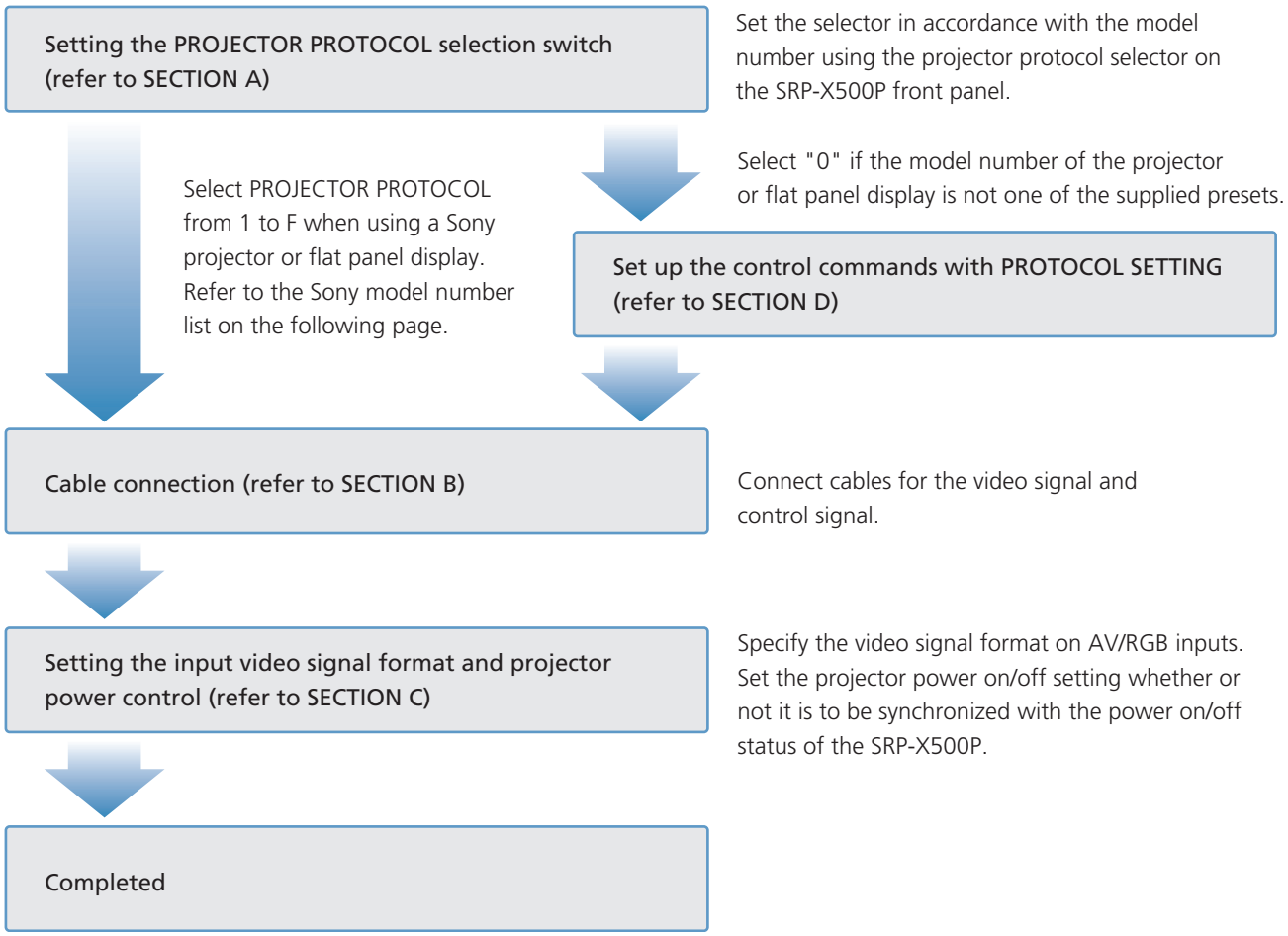
5-4. Projector Control

Outline

The SRP-X500P is equipped with PROJECTOR CONTROL RS-232C and CONTROL S interfaces. By pressing the AV/RGB SELECT buttons on the front panel, an array of input signal formats - including composite video, component video, and computer RGB, which are connected to the AV/RGB inputs – can be seamlessly switched. In addition, projector power on/standby control and projector input selection commands are sent via the PROJECTOR CONTROL RS-232C or CONTROL S interface.

Setting Procedure

The following flow chart indicates the installation and settings to control a projector from the SRP-X500P.



SECTION A: PROJECTOR PROTOCOL Select Switch Setting

From the switch on the front panel, set the PROJECTOR PROTOCOL selector in accordance with the product model. The following table indicates the setting for each model of Sony projector or flat panel display. This setting takes effect after power is turned off and on.

When using a Sony projector or flat panel display

The SRP-X500P selects the projector protocol to control a projector or flat panel display. By selecting the preset switch, the following projectors and flat panel displays can be controlled from the SRP-X500P (effective as of October 2006).

Product model	PROJECTOR PROTOCOL selector setting	Interface	RGB INPUT connector on the projector or monitor
VPL-CX85/CX80	1	RS-232C	INPUT A
VPL-PX35/PX40	2	RS-232C	INPUT D
VPL-FX51/FX50	3	RS-232C	INPUT A
VPL-PX11	4	RS-232C	INPUT A
VPL-PX32/PX31	5	RS-232C	INPUT A
FWD-50PX1/50PX2	6	RS-232C	INPUT 2
PFM-42X1/42V1	7	RS-232C	INPUT 1
PFM-42B2/42B1	8	RS-232C	INPUT 1
PFM-50C1	9	RS-232C	INPUT A
VPL-PX15	A	CONTROL S	INPUT A
VPL-FX52	B	RS-232C	INPUT C
FWD-42PV1	C	RS-232C	INPUT 2

Chart 1: Applicable Sony Projectors and Flat Panel Displays

When using a projector or flat panel display manufactured by another company

If the projector or flat panel display is not made by Sony, or not included in the above table, set the PROJECTOR PROTOCOL selector to 0 and use the SRP-X500P Manager software to make settings. For more details, refer to SECTION D: Projector Control Using the Protocol Setting Function.

SECTION B: Cable Connection

When the SRP-X500P is connected to a projector, its power status and input signal selection are linked to those of the SRP-X500P. Connect the SRP-X500P and the projector using video cables and RS-232C or CONTROL S cables to achieve the control line shown in Fig. 17.

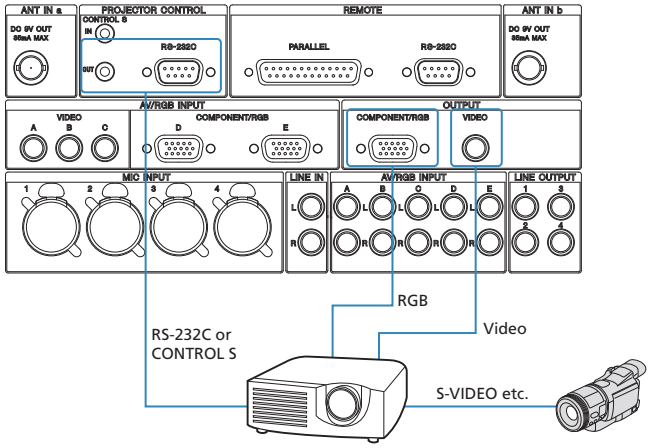


Fig. 17 Cable Connection

Video cable

The input connector for RGB/component signals varies depending on the projector. For the right connection, please refer to the RGB INPUT connector column in Chart 1. If the video format of the AV component is not supported by the AV/RGB INPUT of the SRP-X500P (for example, S-VIDEO), connect it directly to the projector. Signals directly connected to the projector can be set as selectable from the front panel AV/RGB SELECT buttons of the SRP-X500P.

Some projectors have separate RGB and component signal inputs; however, the SRP-X500P uses one 5-BNC connection containing both of these signals. To connect RGB and component video to a projector that contains separate RGB and component video inputs, use an external 1 x 2 distribution amplifier. This distributes the 5-BNC output of the SRP-X500P into two separate output signals.

Control cable

The control interface also varies depending on the projector. For correct connection, refer to the Interface column in Chart 1.

E.g.: When connecting AV components to the AV/RGB INPUT on the projector which uses RS-232C for the control line

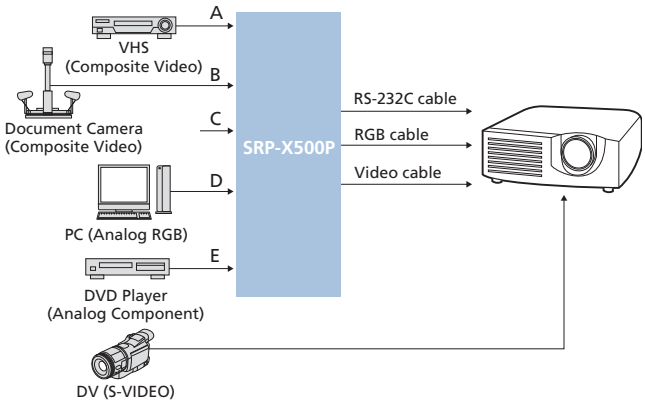


Fig. 18 Connection Example

SECTION C: Input Video Signal Format and Projector Power Setting

Use the supplied SRP-X500P Manager software to set the video signal format connected to AV/RGB INPUT A to E. In addition, set the projector or flat panel display power on/standby control as required. It can be linked or not linked to the power status of the SRP-X500P. These settings are activated on the PARALLEL/PROJECTOR CONTROL tab.

Video format setting

Click the SIGNAL DEFINE selection radio button to select the format of the video signal which is input to each AV/RGB INPUT A to E connector. When switching the AV source from the AV/RGB SELECT button on the SRP-X500P, the mixer sends a control command to switch the input signal format on the projector or display. This command depends on the SIGNAL DEFINE settings.

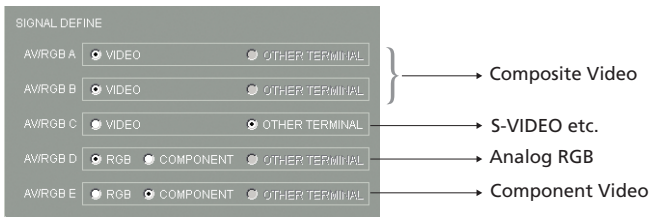


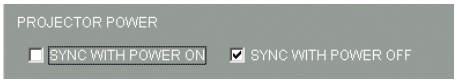
Fig. 19 Setting Example of Fig. 18

If the video format of the AV component is not supported by the AV/RGB INPUT of the SRP-X500P (for example, S-VIDEO), select OTHER TERMINAL. This enables signals directly connected to the projector or flat panel display to be set as selectable from the front panel AV selector buttons of the SRP-X500P.

Power setting

Projector power control can be set using the PROJECTOR POWER setting.

- SYNC WITH POWER ON
  Projector or flat panel display power on is interlocked with the power switch operation of the SRP-X500P.
- SYNC WITH POWER OFF
  Projector or flat panel display power standby is interlocked with the power switch operation of the SRP-X500P.



SECTION D: Projector Control Using the Protocol Setting Function

The SRP-X500P controls input signal selection and power on/standby of the projector by sending the control command to the projector's RS-232C terminal.

The following are the minimum projector requirements:

- RS-232C terminal
- RS-232C communication protocol
- RS-232C specifications:
  - Baud rate: 9600bps, 19200 bps, or 38400 bps
  - Parity bit: None, Even, or Odd
  - Data length: 8-bit
  - Stop bit: 1-bit
  - Flow control: None

Know-how of projector control

Generally, a projector cannot receive a command via the RS-232C terminal during warm-up/cool-down of the lamp or while detecting the sync signal of input video. The user must wait to complete each process in sequence: power on, select the input connector, and projection.

With the SRP-X500P, sending a control command and waiting for the process on the projector are control sequences. By combining multiple control sequences, the SRP-X500P controls the projector power on/standby and input signal selection.

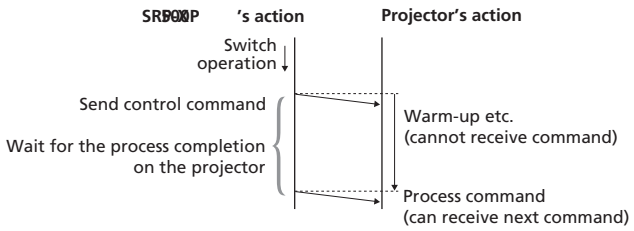
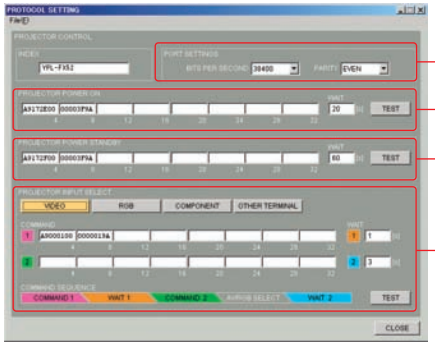


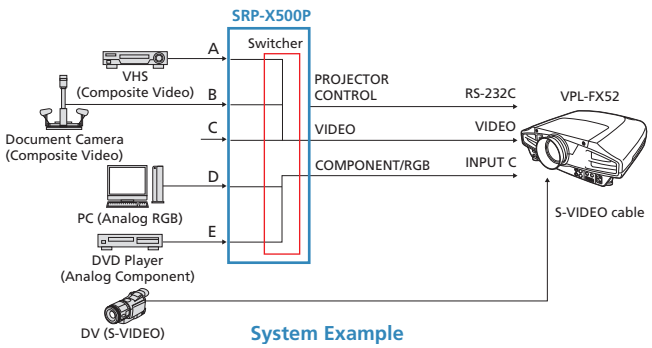
Fig. 20 Control Sequences to Control a Projector

Protocol setting

The following describes how to control a projector using the protocol setting function of the supplied SRP-X500P Manager software. We use the Sony VPL-FX52 Data Projector as an example.

1. Select the PARALLEL/PROJECTOR CONTROL tab on the SRP-X500P Manager software.
2. Click the PROTOCOL SETTING button to display the following screen.
3. Enter commands in Hex format. Convert ASCII command values to Hex equivalent values using the supplied conversion table (see appendix).



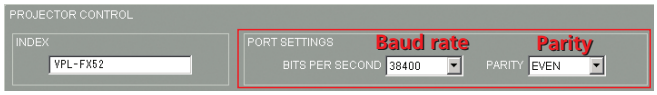


System Example

Setting the communication format

Input the RS-232C communication format of the VPL-FX52 in the PORT SETTING input box.

(Baud rate: 38400 bps; Parity bit: EVEN)

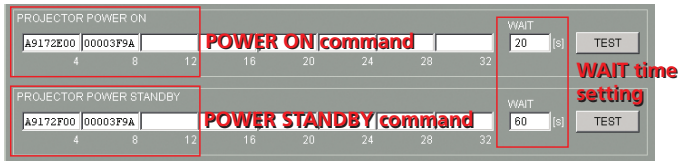


Setting the POWER ON and STANDBY commands of the VPL-FX52

POWER ON command: A9 17 2E 00 00 00 3F 9A (HEX)

POWER STANDBY command: A9 17 2F 00 00 00 3F 9A (HEX)

Set the wait time of the POWER ON command to 20 sec, and the wait time of the POWER STANDBY command to 60 sec. These are the effective settings explained in the Know-how of projector control section. They should be adjusted by actually connecting the projector and measuring the time it takes to enable projector power on or standby (or refer to the projector's documentation for these values).

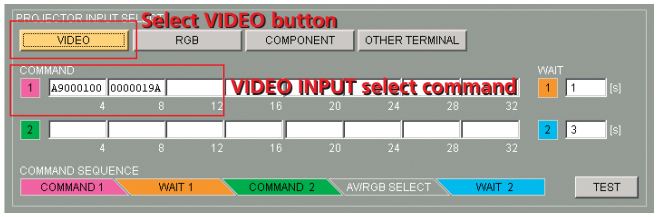


Setting the VIDEO INPUT SELECT of the VPL-FX52

Be sure to input the command after selecting the VIDEO button in PROJECTOR INPUT SELECT.

VIDEO INPUT SELECT command: A9 00 01 00 00 00 01 9A (HEX)

This command is sent to the projector when the AV/RGB INPUT of the SRP-X500P is selected to A, B, C. Then the input on the projector is switched to VIDEO.

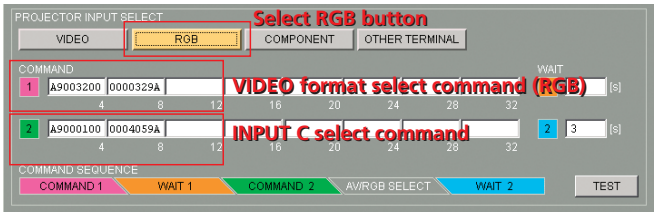


Setting the input select command of the INPUT C on the VPL-FX52

RGB or component signals can be input to INPUT C. The video format for INPUT C has to be selected.
First, set the RGB signal.

VIDEO format select command (RGB): A9 00 32 00 00 00 32 9A (HEX)

INPUT C select command: A9 00 01 00 00 04 05 9A (HEX)

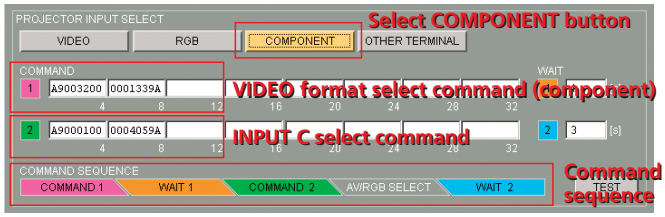


Next, set the component signal.

VIDEO format select command (component): A9 00 32 00 00 01 33 9A (HEX)

INPUT C select command: A9 00 01 00 00 04 05 9A (HEX)

This command is sent to the projector when the AV/RGB INPUT of the SRP-X500P is selected to D or E. Whether sending an RGB command set or a component command set depends on the SIGNAL DEFINE setting explained in Input Signal Selection.



In this way, the SRP-X500P can send two commands at a time when selecting the input signal on the projector. However, it is also necessary to add wait time between one command and the next.

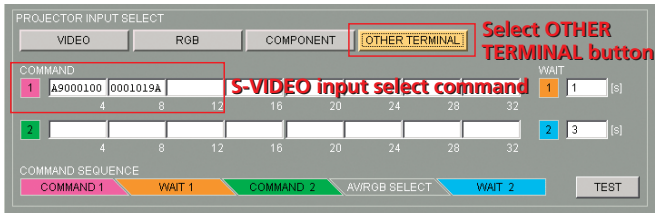
In our VPL-FX52 example, one second should be input to WAIT1, and three seconds to WAIT2. COMMAND SEQUENCE indicates the order of control sequence execution.

Setting the OTHER TERMINAL

The SRP-X500P can select the video signal format that directly inputs to the projector. This function is called OTHER TERMINAL (in other words, any input terminal other than the SRP-X500P).

The following system example illustrates directly connecting a DV camcorder and the VPL-FX52 via S-VIDEO.

S-VIDEO INPUT SELECT command: A9 00 01 00 00 10 01 9A (HEX)



To select OTHER TERMINAL, it is necessary to select any one of the AV/RGB INPUT A to E buttons. Set any input to OTHER TERMINAL in SIGNAL DEFINE, as shown in Fig. 19 on page 22. (In Fig. 19, INPUT C is selected to OTHER TERMINAL.)

6 Appendix

Feedback

What is feedback (howling)?

Feedback in a sound system incorporating microphones and speakers is the ringing or screeching noise you occasionally hear. This phenomenon is often called “howling.”

Mechanism of howling

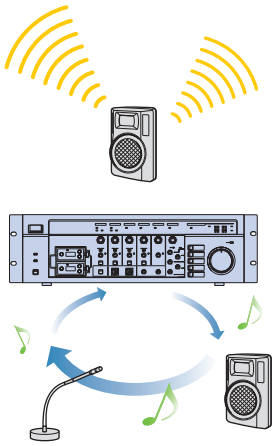
In a sound system, the microphone signal is amplified and output from a loudspeaker. However, the output signal is sometimes picked up by the microphone again, and loops around the microphone, amplifier, and speaker. If the loop gain reaches one time or more, the signal is limitlessly amplified. This is when howling occurs.

Frequency response between microphones and speakers

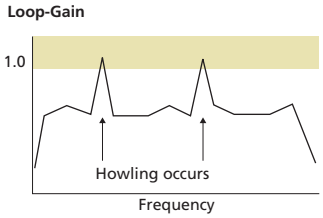
Controlling the frequency response between microphones and speakers is the key to suppressing howling. The response varies depending on the width of the room, the materials of the wall and ceiling, and the speaker location.

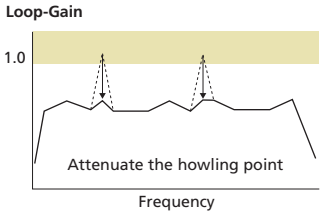
Feedback reduction

The feedback reduction incorporated in the SRP-X500P scans the audio spectrum each time the button is held down (for two seconds or more) to detect the howling frequency points and suppress the level of the detected frequency bands. This process is performed independently for each microphone input. If you change the type or location of a microphone, feedback reduction should be activated again in order to optimize the amount of feedback reduction.



Mechanism of Howling





Automatic Gain Control (AGC)

Varying audio volume

When picking up sound with microphones, the volume differs from person to person, and depending on the distance between people’s mouths and the microphone. The Automatic Gain Control (AGC) function closes these gaps and maintains a constant audio level. AGC consists of three processes - compressor, make gain, and gate.

Compressor

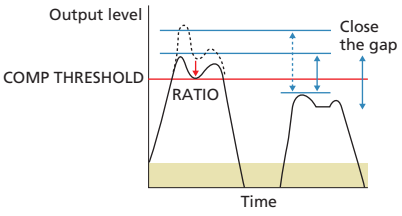
Compressor is used to suppress loud sounds. COMP THRESHOLD and RATIO can be adjusted.

Make gain

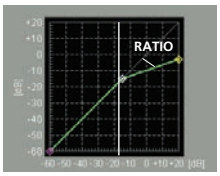
Make gain boosts the volume of a small voice to maintain the total volume at a constant level.

Gate

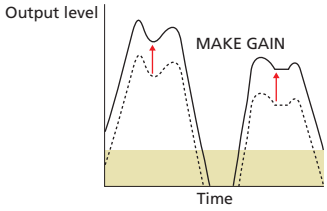
While make gain amplifies the signal level, ambient noise must be controlled when the presenter is silent. Gate suppresses ambient noise, with an ability to adjust the GATE THRESHOLD and RANGE.



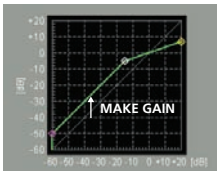
Compressor



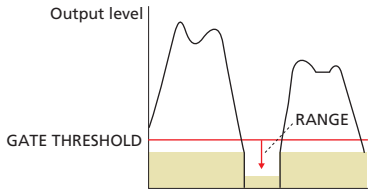
COMP THRESHOLD



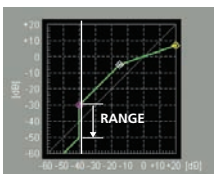
Make Gain



MAKE GAIN



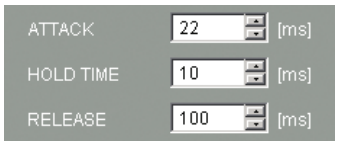
Gate



GATE THRESHOLD

Response time

As mentioned on the previous page, the AGC changes the gain in response to the input level. However, sound from a loudspeaker may be unnatural when the volume is rapidly changed by the AGC. ATTACK, HOLD TIME, and RELEASE adjustments reduce unnatural sounding level changes.



Response time of the attack

Time to maintaining the gain

Response time of the attenuation

Effect of Delay

When configuring a multiple speaker system, you should take the "hass effect" (see below) into consideration. Using the hass effect, the delay processor makes adjustments to locate signal sources in the desired locations.

Speed of sound

Sound speed is calculated as: sound speed ≒ 331.5 + 0.6t (m/s). When the temperature is 14 °C, the speed of sound is usually described as 340 m/s.

Hass effect

When the sound is amplified from multiple speakers, we feel as if the sound comes from the direction where the signal first arrives at our ears. This phenomenon is called the "hass effect." Using this effect, we can control the source of sound by adding delay on any speakers.

Sound localization

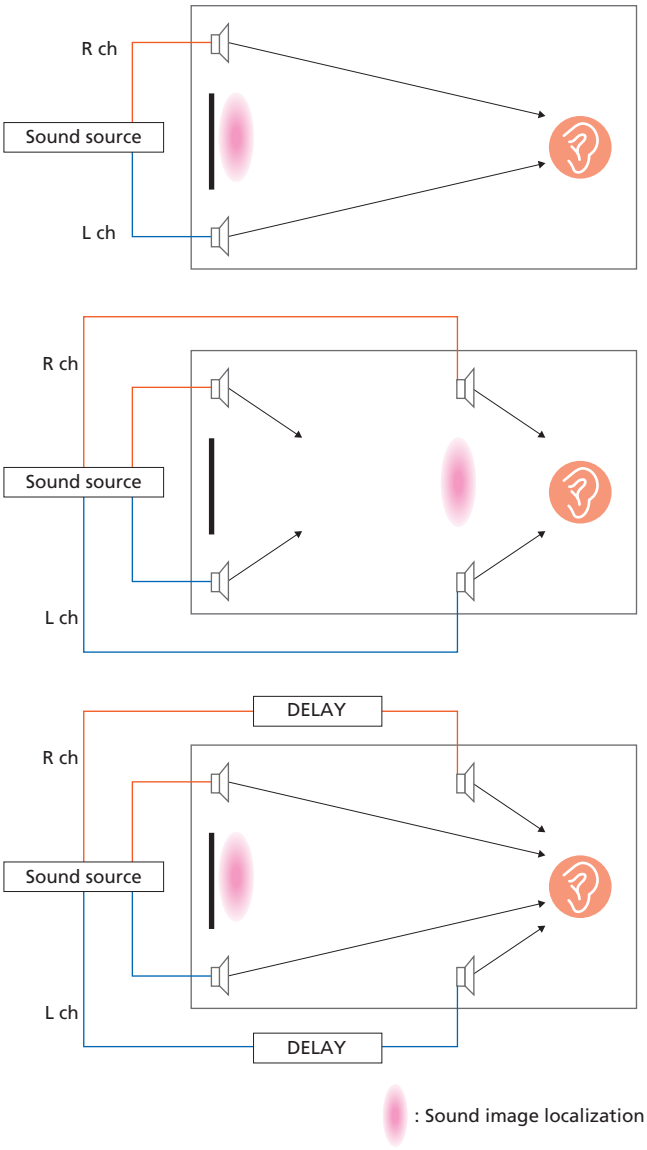
In a stereo speaker system, a listener identifies that the source of sound is located in the middle of the L and R speakers. This effect is called "the origin of sound located at the mid-point between two speakers."

Sound image of satellite speakers

In a sound system incorporating satellite speakers, sound from a satellite speaker can reach the listeners in the back of the room faster than sound coming from the front speakers. So human ears misinterpret the sound source, thinking it is the mid-point between satellite speakers not the front screen. This makes our ears feel uncomfortable.

Compensation with delay

The delay function controls the timing of the sound reaching the listener. By delivering the sound from main speakers 10 to 20 ms faster than satellite speakers, the source of the sound can be appropriately located on the screen. As a result, listeners will hear a more natural sound.



Delay Compensation

Connecting High-impedance Speakers

High-impedance speakers have the following features:

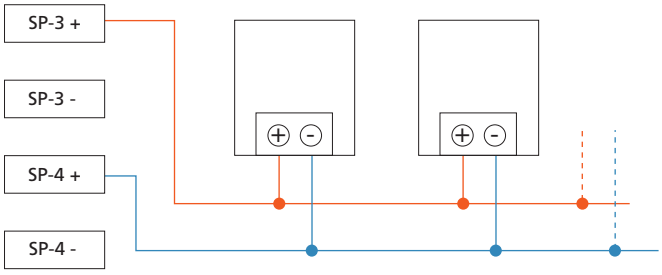
- Multiple speakers can be connected (see table below)
- Extended cable lengths, due to low cable loss

The maximum number of high-impedance speakers that can be connected depends on impedance levels:

Impedance of speaker	Power of speaker	Connectable number of speaker
1 kΩ	5 W	12
3.3 kΩ	1.5 W	40
10 kΩ	0.5 W	120

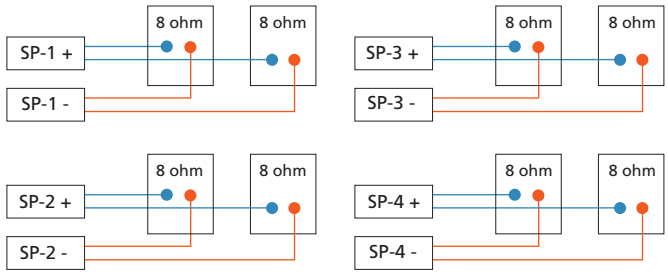
Wiring of high-impedance speakers

Connect high-impedance speakers to the + terminal of the SP3 and SP4. Before making these connections, set the SP3 and SP4 outputs to 70V Line.



Connecting Low-impedance Speakers

The SRP-X500P can drive eight 8 Ω speakers (two 8 Ω speakers can be connected to each SPEAKER OUTPUT). Parallel connection is required. (Serial connection is not recommended.)



Programming a Learning-type Remote Commander

Commands that control the SRP-X500P functions can be stored in an optional programmable learning-type IR remote commander with the following functions:

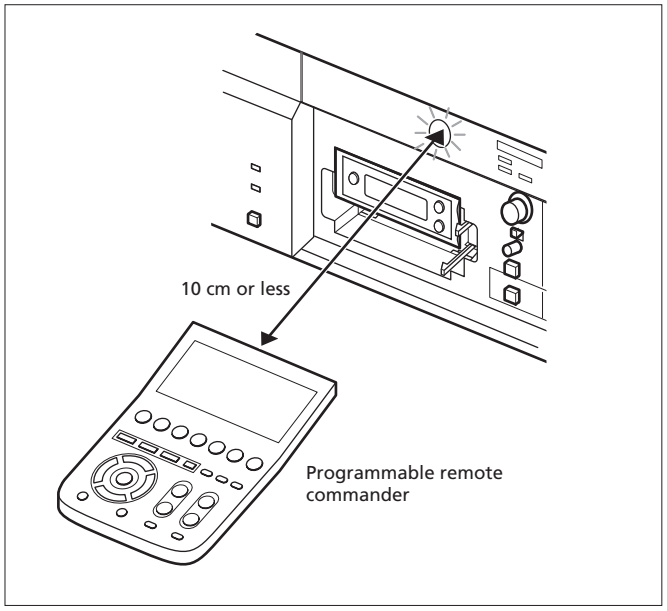
- AV/RGB SELECT buttons
- PROJECTOR POWER switch
- MASTER volume control
  Turning up the volume
  Turning down the volume
  Muting the volume

For details of how to program your remote commander, please refer to its supplied operation manual.

1. Hold down the IR OUTPUT MODE button for two seconds or more. The button lights up green and the remote emitter/sensor lights up red when the SRP-X500P is ready to emit commands from the remote emitter/sensor. Note that no audio/video is output from the SRP-X500P during this time.

2. Operate the SRP-X500P function to be programmed to the remote commander as follows:
   To program the function of the AV/RGB SELECT buttons
   Press the AV/RGB SELECT button to be programmed to the remote commander so that it lights up.
   To program the function of the PROJECTOR POWER switch
   Press the PROJECTOR POWER switch so that it lights up.
   To program the function for turning up the MASTER volume
   Rotate the MASTER control to the 11 o'clock position so that the MASTER MUTING indicator lights up.
   To program the function for turning down the MASTER volume
   Rotate the MASTER control to the 9 o'fclock position so that the MASTER MUTING indicator lights up.
   To program the function for muting the MASTER volume
   Rotate the MASTER control to the infinity position so that the MASTER MUTING indicator lights up.

3. Place the remote commander so that its top points towards the remote emitter/sensor, and then ready the remote commander for programming commands from the SRP-X500P.



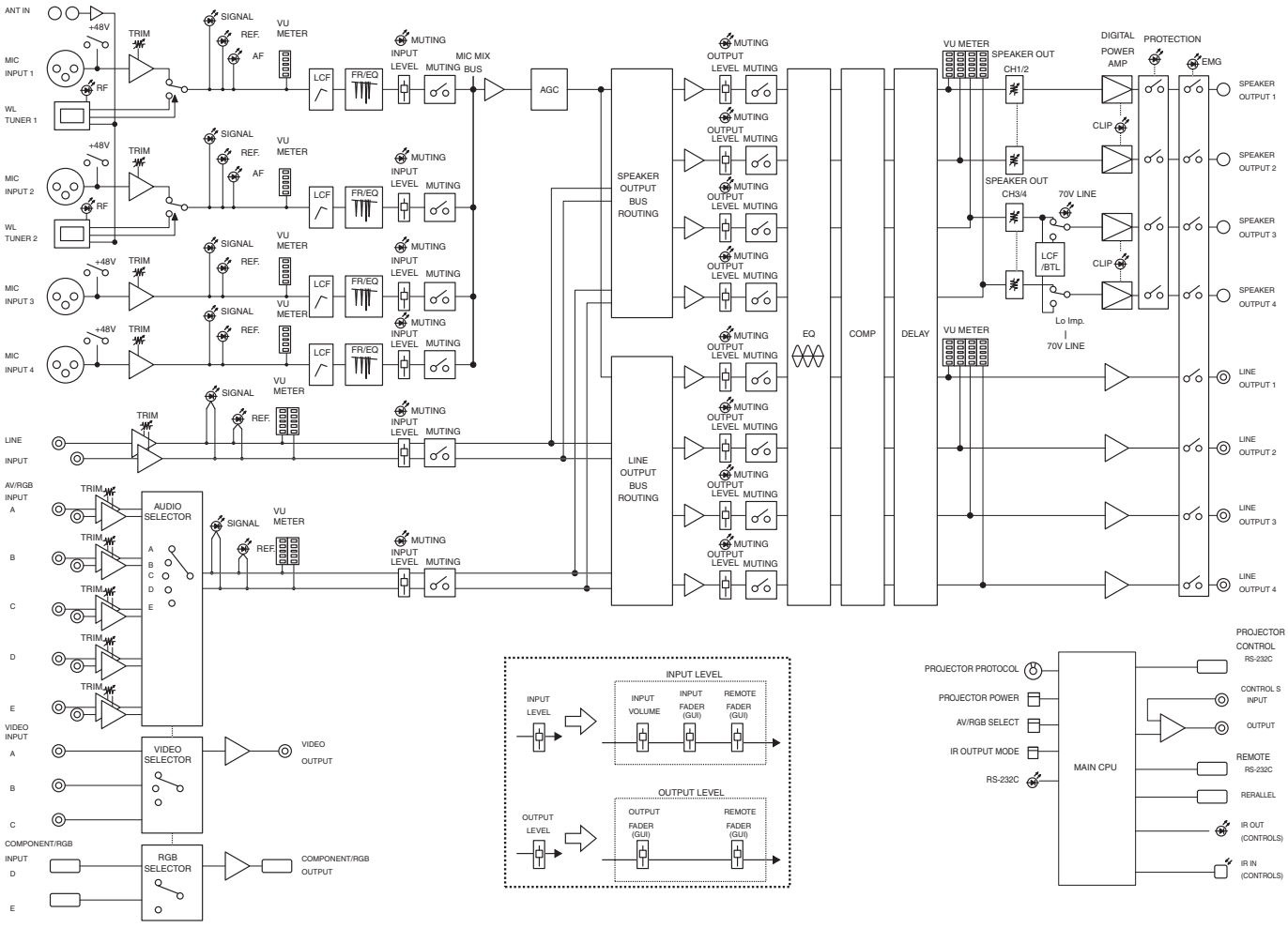
4. Press the IR OUTPUT MODE button. The button and the remote emitter/sensor flash, and commands are output from the remote emitter/sensor.

5. When programming has completed, press the IR OUTPUT MODE button again. The button lights up and the command output stops.

6. To program other functions, repeat this procedure from step 2.

7. Hold down the IR OUTPUT MODE button for two seconds or more. The button and the remote emitter/sensor turn off and the SRP-X500P returns to normal status. After programming has completed, be sure to verify that the command has been correctly programmed. If it has not, repeat the procedure from step 1.

Block Diagram



ASCII - HEX Conversion Table

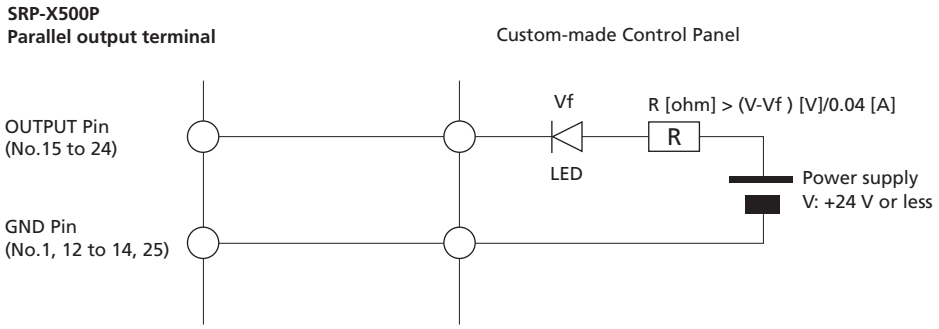
Hex	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	‘	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	“	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	‘	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF/NL	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l	|
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	DEL

e.g.
“A” (ASCII) = “41” (HEX)
“O” (ASCII) = “4F” (HEX)
“0” (ASCII) = “30” (HEX)
“1” (ASCII) = “31” (HEX)

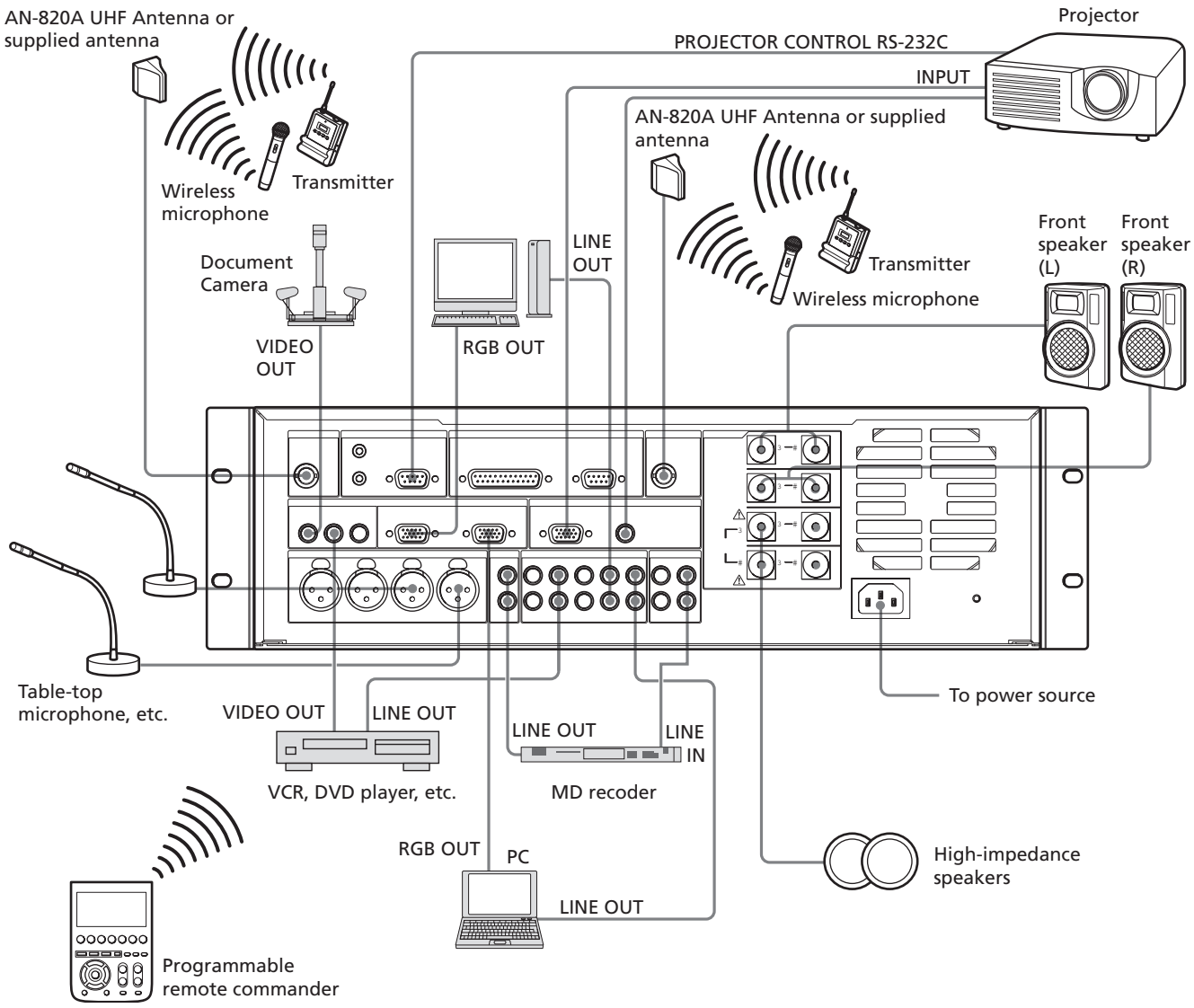
Connecting Status LEDs on the Parallel Port

The following shows a typical LED drive circuit connected to the parallel output port of the SRP-X500P. To find the appropriate value of the required resistor, apply the following formula:

R [ohm] > (V - Vf) [V]/0.04 [A] (V: +24 V or less)



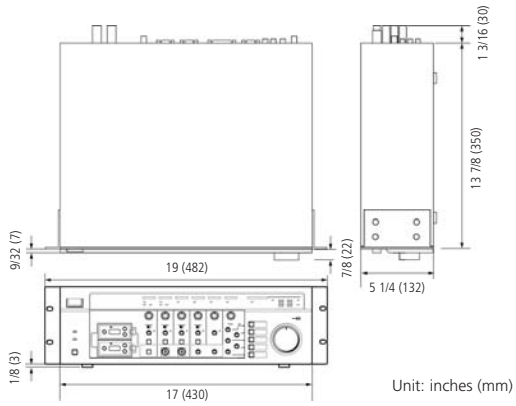
System Configuration



Specifications

SRP-X500P	
General	
Power requirements	AC 120 V, 60 Hz (for the U.S.A and Canada) AC 220 V, 50/60 Hz (for China) AC 230 V, 50/60 Hz (for other countries)
Power consumption	120 W
Operating temperature	+32 to +104 °F (0 to +40 °C)
Storage temperature	-4 to +140 °F (-20 to +60 °C)
Dimensions (W x H x D)	19 x 5 1/4 x 14 inches (482 x 132 x 357 mm)
Weight	Approx. 26 lb 3 oz (12 kg)
Supplied accessories	AC power cord (1), operation manual (1), foot (4), SRP-X500P Manager Software CD-ROM (1), antenna (2)
Electrical characteristics	
Composite video	
Color system	NTSC/PAL/SECAM
Frequency response	50 Hz to 10 MHz
Level	1.0 Vp-p (75 Ω)
Component video	
Color system	NTSC/PAL
Frequency response	50 Hz to 150 MHz
Level	Y: 1.0 Vp-p (75 Ω), R-Y/B-Y: 0.7 Vp-p (75 Ω)
RGB	
Frequency response	50 Hz to 150 MHz
Resolution	SXGA: 1280 x 1024 pixels, 60 Hz, supporting 480p/1080i
Level	R/G/B: 0.7 Vp-p (75 Ω), Sync/HD, VD: 1 to 5 Vp-p (47 kΩ) sync positive/negative
Audio (analog)	
Frequency response	Line input to Line output: 20 Hz to 20 kHz ±0.5 dB (1 kHz reference)
T.H.D.	Line input to Line output: Less than 0.01% (1 kHz)
S/N ratio	Line input to Line output: More than 94 dB (IHF A)
Crosstalk	Line input to Line output: Less than -80 dB (1 kHz)
Others	
Antenna in (a/b)	BNC x2, DC +9 V out
Microphone power supply	DC +48 V, MIC 1 to 4 inputs

Dimensions



Unit: inches (mm)

Audio inputs

Input	Connector	Circuit	Channel	Reference/peak level	Impedance
MIC/WL 1, 2	XLR-3-31 type	Balanced	Mono	-60 to -30 dBu/-37 to -7 dBu	More than 2.2 kΩ
MIC 3, 4	XLR-3-31 type	Balanced	Mono	-60 to -30 dBu/-37 to -7 dBu	More than 2.2 kΩ
LINE	Phono x 2	Unbalanced	Stereo	-30 to 0 dBu/+10 dBu	More than 10 kΩ
AV/RGB (A to E)	Phono x 2	Unbalanced	Stereo	-30 to 0 dBu/+10 dBu	More than 10 kΩ

Audio output

Output	Connector	Circuit	Channel	Reference/peak level	Load impedance
LINE 1 to 4	Phono x 1	Unbalanced	Mono	-5 dBu/+15 dBu	More than 10 kΩ

Speaker outputs

Output	Connector	Speaker impedance	Rated power
CH1/CH2	Screw-type binding terminal x 4	4 to 16 Ω	90 W (4 Ω, 8 Ω)*
CH3/CH4 (70V LINE)	Screw-type binding terminal x 4	4 to 16 Ω (at low impedance) 82 to 10 kΩ (at 70 V LINE)	50 W (4 Ω, 8 Ω)* 60 W (82 Ω)

* The same power rating can be acquired for both 8 Ω and 4 Ω speaker impedance. Connect the speakers so the total speaker impedance is 4 Ω or higher.

AV/RGB inputs

Input	Connector	Signal type
VIDEO (A to C)	Phono x 1	Composite
COMPONENT/RGB (D, E)	D-sub 15-pin	Component/RGB

AV/RGB outputs

Output	Connector	Signal type
VIDEO	Phono x 1	Composite
COMPONENT/RGB	D-sub 15-pin	Component/RGB

Remote control terminal

RS-232C ports	Connector	Function	
PROJECTOR CONTROL	D-sub 9-pin (male)	Input selection, Power on/standby	
REMOTE	D-sub 9-pin (male)	Setting of SRP-X500P audio and switch functions from a PC running the SRP-X500P Manager software	
Parallel I/O ports	**Connector**	**Function**	**Type**
PARALLEL IN	D-sub 25 pin (female)	AV selection, Power on/off, Scene recall, Volume, Volume up/down, Muting	Make-contact CMOS level, active low
PARALLEL OUT		Output status of Parallel input function	Open collector
Control S ports	**Connector**	**Function**	
PROJECTOR IN*	Mini jack	For the connection of projector remote commander	
PROJECTOR OUT*	Mini jack	Input selection, Power on/standby	

* For the VPL-PX15 LCD data projector only

SONY

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