

RCS-848



 **Roland**®

Owner's Manual
and User's Guide



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Introduction

The Roland RCS-848 represents the next generation in music conferencing systems. This all-in-one communication solution is perfect for group piano teaching, music ensemble instruction, and even sophisticated language lab teaching. Because the RCS-848 doesn't rely on external computer hardware or software, it's both intuitive and easy-to-use. As a result, music conferencing will never be the same.

In Standard mode, the RCS-848 allows a teacher to monitor and communicate with up to eight students in stereo via nine supplied RCS-1 interface boxes and RCS-HS headsets—the system's expandable to 48 students in stereo with optional RCS-8EXP expansion kits. In addition, any student may be assigned to one of four practice groups (i.e. Group A, B, C, or D) for ensemble practice, performance, and communication. The result is a flexible music conferencing system that's fully expandable.

The RCS-848 can also operate in Split mode, allowing a teacher to communicate with up to 16 students in mono via nine supplied RCS-1 interface boxes and RCS-HS headsets by adding optional RCS-HS headsets as needed—or up to 48 students in mono with optional RCS-8EXP expansion kits and additional RCS-HS headsets. (Practice groups are not available in Split mode.)

Main Features

Flexible Music Conferencing System

- Communicate with up to eight students in stereo.
- Control the rack-mountable audio hub from the RCS-848 Conference Controller.
- Use Split mode to accommodate up to 16 students in mono via nine included RCS-1 interface boxes and RCS-HS headsets by adding optional RCS-HS headsets as needed.
- Set up easily using supplied connectors, cables, and headsets.
- Drill students privately, in groups, or in pairs.
- Create up to four separate student groups.

Fully Expandable

- Double student headset capacity by adding optional RCS-HS headsets as needed.
- Communicate with up to 48 students in stereo by adding optional RCS-8EXP expansion kits.
- Accommodate up to 48 students in mono using Split mode by adding optional RCS-8EXP expansion kits and RCS-HS headsets as needed.
- Broadcast an external audio source (e.g. CD player, computer, Music Tutor, etc.) using the [CD In] and/or [Aux. In] jacks.
- Record lectures and performances using an external audio recorder—such as a CD, hard disk, computer, etc.—using the [Rec. Out] jacks.
- Monitor and communicate through an external monitoring (speaker) system such as a stereo power-amp with speakers using the [Mon. Out] jacks.

Included Items

Item	Qty.
RCS-848 Hub	(1)
RCS-848 Conference Controller	(1)
RCS-1 Interface Boxes	(9)
RCS-HS Stereo Headsets	(9)
RJ-45 (8-conductor telephone-type) Cables	(10)
1/4" to 1/4" TRS Cables	(9)
AC Adapter	(1)

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Panel Descriptions

RCS-848 Conference Controller

1. [GROUPS A, B, C, D] Buttons

Establish two-way communication between the teacher and students in a selected group. When one of these buttons (i.e. [A], [B], [C], or [D]) is held down and student number buttons are engaged, the selected students can listen to, talk to, and play for, or along with, other students in the selected group. Once groups have been established, engaging one (or several) of these buttons allows the selected student group(s) to listen to, talk to, and play for, or with, the teacher. The [TEACHER MIC] button must be engaged to activate the teacher's microphone. To clear all groups, press the [All] and [STUDENT MUTE] buttons simultaneously (p. 15).

2. [Bank] Button

Selects the bank of students (e.g. "1-8," "9-16," "17-24," etc.) to be controlled by the Student [1-8] buttons (p. 14).

3. Student [1-8] Buttons

Establish two-way communication between the teacher and student(s). When one or several of these buttons is engaged, the selected student(s) can listen to, talk to, and play for, or with, the teacher. The [TEACHER MIC] button must be engaged to activate the teacher's microphone (p. 14).

4. [All] Button

Establishes one-way communication between the teacher and students. When this button's engaged, all students can listen to and play along with the teacher. Students will not hear other student instruments and microphones. The [TEACHER MIC] button must be engaged to activate the teacher's microphone (p. 14).

5. [STUDENT MUTE] Button

Temporarily disables (or "mutes") all student instruments. This button is especially useful when undivided student attention is desired (p. 14).

6. [TEACHER MIC] Button

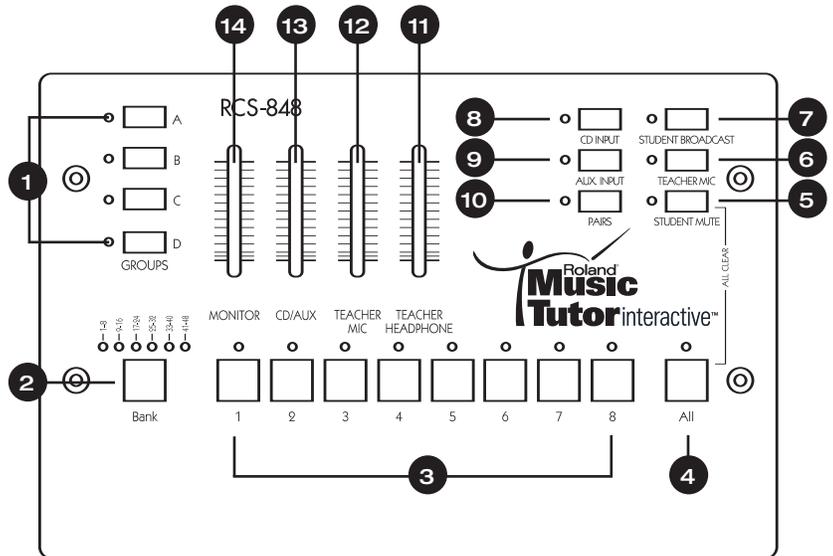
Activates the teacher's microphone. When this button's engaged, the selected student(s) or group(s) can listen to the teacher's microphone (p. 14).

7. [STUDENT BROADCAST] Button

Broadcasts two-way communication between the teacher and selected student(s) to all headsets. When this button's engaged, the selected student(s) can listen to, talk to, and play for, or with, the teacher while the remaining students listen (p. 16).

8. [CD INPUT] Button

Broadcasts audio to all headsets from an external audio source (e.g. CD Player, Computer, Music Tutor, etc.) connected to the [CD In] jacks. When this button's engaged, each student can listen to and play along with the external audio material. Students will not hear other student instruments. Pressing this button cancels the [AUX. INPUT] button (p. 16).



Panel Descriptions

9. [AUX. INPUT] Button

Broadcasts audio to all headsets from any external audio source (e.g. CD Player, Computer, Music Tutor, etc.) connected to the [Aux. In] jacks. When this button's engaged, each student can listen to and play along with the external audio material. Students will not hear other student instruments. Pressing this button cancels the [CD INPUT] button (p. 16).

10. [PAIRS] Button

Establishes two-way communication between adjacent students (i.e. Student 1 and Student 2, Student 3 and Student 4, etc.) for duet-style practicing. When this button's engaged, adjacent students can listen to, talk to, and play for, or with, their partner. This button overrides the [GROUPS A, B, C, D] buttons (p. 15).

11. [TEACHER HEADPHONE] Slider

Adjusts the volume level of the teacher's headphones. Slide the slider towards the top of the RCS-848 to increase the volume level and slide the slider towards the bottom of the RCS-848 to decrease the volume level (p. 13).

12. [TEACHER MIC] Slider

Adjusts the volume level of the teacher's microphone. Slide the slider towards the top of the RCS-848 to increase the microphone level and slide the slider towards the bottom of the RCS-848 to decrease the microphone level (p. 14).

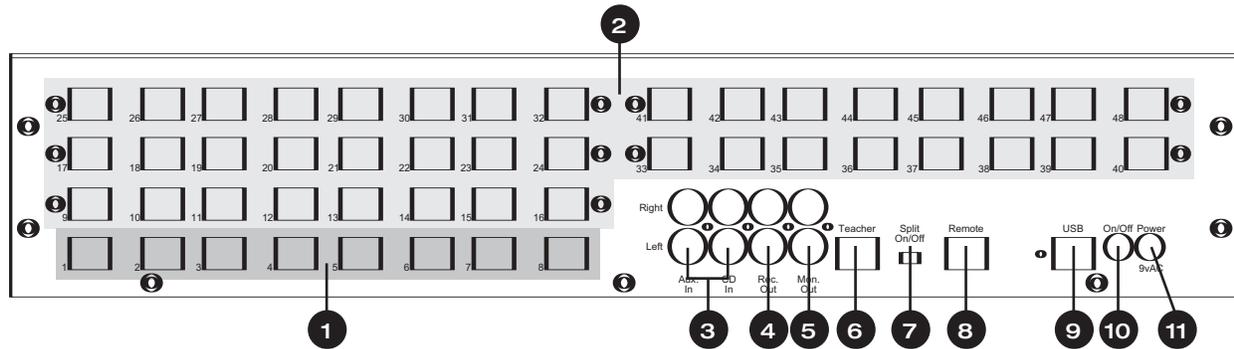
13. [CD/AUX] Slider

Adjusts the volume level of external audio devices connected via the [CD In] and [Aux. In] jacks. Slide the slider towards the top of the RCS-848 to increase the volume level and slide the slider towards the bottom of the RCS-848 to decrease the volume level (p. 16).

14. [MONITOR] Slider

Adjusts the volume level of all audio sent to an external monitor (speaker) system via the RCS-848's [Mon. Out] jacks. Slide the slider towards the top of the RCS-848 to increase the volume level and slide the slider towards the bottom of the RCS-848 to decrease the volume level. This slider is only active when an external monitor system is connected to the RCS-848's [Mon. Out] jacks (p. 17).

RCS-848 Hub



1. Student Instrument [1-8] Connectors

Connect the RCS-848 Hub to the student RCS-1 interface boxes via supplied RJ-45 (8-conductor telephone-type) cables (p. 10).

2. Student Instrument [9-48] Expansion Slots

Accept RCS-8EXP (8-student) expansion boards to connect the RCS-848 Hub to all RCS-1 interface boxes via supplied RJ-45 (8-conductor telephone-type) cables (p. 1).

3. [Aux. In] / [CD In] Jacks

Connect the RCS-848 Hub to the output jacks of external audio playback devices (e.g. CD Players, Computers, Music Tutors, etc.)(p. 16).

4. [Rec. Out] Jacks

Connect the RCS-848 Hub to the input jacks of an external audio recording device (e.g. CD Recorder, Hard Disk Recorder, Computer, etc.) (p. 16).

5. [Mon. Out] Jacks

Connect the RCS-848 Hub to the input jacks on an external monitoring system (e.g. stereo power-amp with speakers) (p. 17).

6. [Teacher] Connector

Connects the RCS-848 Hub to the teacher's RCS-1 interface box via a supplied RJ-45 (8-conductor telephone-type) cable (p. 10).

7. [Split On/Off] Switch

Determines the operational mode of the RCS-848. When this switch is set to Off (i.e. to the right), the RCS-848 operates in *Standard* mode, accommodating one stereo instrument per student interface box. When this switch is set to On (i.e. to the left), the RCS-848 operates in *Split* mode, allowing two mono instruments per student interface box. **Note:** *The power must be off when setting this switch*(p. 1).

8. [Remote] Connector

Connects the RCS-848 Hub to the Conference Controller via a supplied RJ-45 (8-conductor telephone-type) cable(p. 1).

9. [USB] Connector

Will allow the RCS-848 system to be controlled by an external computer via USB when software is available.

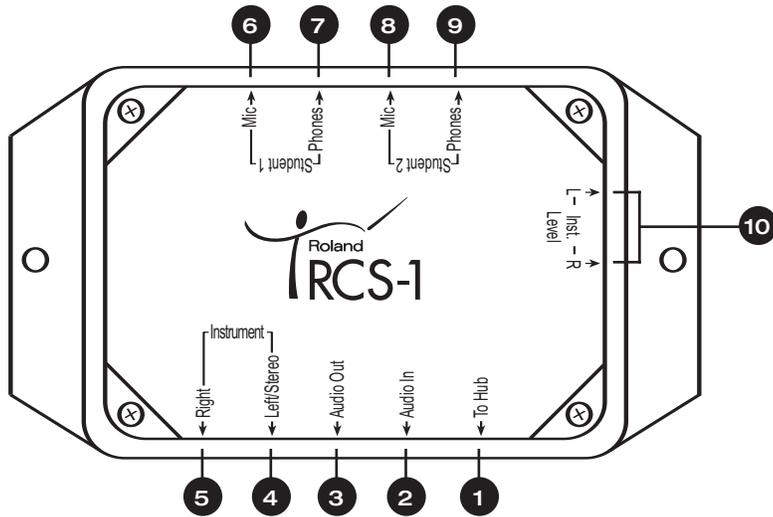
10. [Power] Switch

Turns the RCS-848 system on and off(p. 11).

11. [Power] Jack

Connects the RCS-848 Hub to the supplied AC power adapter (p. 10).

RCS-1 Interface Box



1. [To Hub] Connector

Connects the RCS-1 interface box to the [Teacher] connector or a Student [1–8] connector on the RCS-848 Hub via a supplied RJ-45 (8-conductor telephone-type) cable (p. 10).

2. [Audio In] Connector

Connects the RCS-1 interface box to the output jack(s) on an external audio playback device (e.g. CD, Computer, Music Tutor, etc.)

3. [Audio Out] Connector

Connects the RCS-1 interface box to the input jack(s) on an external audio recording device (e.g. CD, Computer, Hard Disk, etc.)

4. [Instrument Left/Stereo] Connector

Connects the RCS-1 interface box to the headphone jack or left/stereo output jack on a student/teacher instrument.

Note: In Split mode, this is Student 1's [Instrument] input (p. 10).

5. [Instrument Right] Connector

Connects the RCS-1 interface box to the right output jack on a student/teacher instrument.

Note: In Split mode, this is Student 2's [Instrument] input (p. 10).

6. [Student 1 Mic] Connector

Connects the RCS-1 interface box to the [Mic] jack on Student 1's RCS-HS headset.

7. [Student 1 Phones] Connector

Connects the RCS-1 interface box to the [Phones] jack on Student 1's RCS-HS headset.

8. [Student 2 Mic] Connector

Connects the RCS-1 interface box to the [Mic] jack on Student 2's RCS-HS headset.

9. [Student 2 Phones] Connector

Connects the RCS-1 interface box to the [Phones] jack on Student 2's RCS-HS headset.

10. [Inst. Level L/R] Adjusters

Adjust the volume level of the RCS-1 interface box (p. 12).

Chapter 1: Installation Guide

Prepare the Room

Before installing an RCS-848 music conferencing system, there are many factors to consider. For example, the size and shape of the room, the availability of lighting and power outlets, and the ventilation and temperature control of the room all need to be addressed. Please consider the following physical and electrical requirements before installing the RCS-848 music conferencing system.

Physical Requirements

- Create an effective floor plan that ensures a clear “line-of-sight” from all student stations to the teacher station. While this isn’t always possible due to the constraints of a given room, it’s a worthwhile setup goal.
- Be sure that there’s adequate space behind each student station so that the teacher can move easily from station to station.
- Shade windows to regulate sunlight. Minimize bright or direct sunlight because the heat generated by sunlight can overheat the RCS-848. Room temperature should not exceed 85 degrees during normal use. The ideal physical space permits regulated temperature and humidity.
- Use anti-static, or static-resistant, carpet on the floors whenever possible to lower the noise-level in your lab and reduce damage created by static electricity.

Electrical Requirements

- Once the floor plan is defined, determine the number of electrical outlets and power strips needed to supply power to all devices. Isolate the RCS-848 Hub from devices such as computers or lights by plugging the devices into separate 120v wall plug receptacles. Plugging computers or rheostatic lights into the same receptacle as the RCS-848 Hub could cause disturbing noise and hum during operation. Use only the supplied AC power adapter; other AC adapters can damage the unit and void the warranty.
- Use surge protectors on all electronic equipment in the music lab. This includes the RCS-848 Hub, the teacher’s instrument (and computer), student instruments, and all external audio devices. Check the voltage and amperage requirements of the equipment being installed and consult with the building engineering staff regarding the level of electrical service required.
- Set the main power switch on the RCS-848 to the Off or out position before connecting the AC power adapter to a 120v wall plug receptacle. Use only the AC power adapter supplied with the Music Tutor Lab Controller; other AC adapters can damage the unit and void the warranty.
- For further protection against electrical surge damage, disconnect all AC power adapters from the wall plug receptacle during school vacations or summer breaks.

Review the Included Items

The RCS-848 music conferencing system includes all of the components needed to connect up to eight student instruments and one teacher instrument in stereo. Before setting up the RCS-848, be sure you have the following components:

Item	Qty.
RCS-848 Hub	(1)
RCS-848 Conference Controller	(1)
RCS-1 Interface Boxes	(9)
RCS-HS Stereo Headsets	(9)
RJ-45 (8-conductor telephone-type) Cables	(10)
1/4" to 1/4" TRS Cables	(9)
AC Adapter	(1)

Connect the Basic System

Note: It's strongly recommended that all connections be made with the power off.

Place the Components

- Place the teacher's instrument in an optimal teaching position (e.g. at the front of the classroom).
- Place student instruments in rows facing the teacher's instrument (row configuration is optional). Be sure to allow extra space behind each student station so that the teacher can move easily from station to station.
- Place the RCS-848 Hub in a central location.
- Place the Conference Controller on or near the teacher's instrument.
- *Optional*—Place the external audio playback/recording device(s) (e.g. CD player/recorder, hard disk recorder, computer, etc.) on or near the teacher's instrument.
- *Optional*—Place the external audio monitor(s) to the side of the teacher's instrument facing the student instruments.
- *Optional*—Place the video monitor(s) on a pedestal or wall mount near the teacher's station (facing the student instruments). An SVGA projector may also be used, but be sure to allow sufficient, unobstructed space between the projector and screen.

Connect the Cables

- Connect all devices to AC power strips as described under "Electrical Requirements." Note: It's strongly recommended that all connections be made with the power off.
- Place one RCS-1 interface box on each instrument (including the teacher's instrument).
- Use the supplied 1/4" to 1/4" TRS cables to connect the headphone output of each instrument to the [Instrument Left/Stereo] input on each RCS-1 interface box.
- *Optional*—Numerically label each student instrument so that the teacher can easily identify student stations from the optimal teaching position.
- Connect the RCS-848 Conference Controller to the [Remote] connector on the RCS-848 Hub using a supplied RJ-45 (8-conductor telephone-type) cable.
- Connect the teacher's RCS-1 interface box to the [Teacher] connector on the RCS-848 Hub using a supplied RJ-45 (8-conductor telephone-type) cable.

- Connect each student RCS-1 interface box to the corresponding numbered connectors on the RCS-848 Hub using supplied RJ-45 (8-conductor telephone-type) cables.
- *Optional*—Connect the audio outputs on the external audio playback device(s) to the [Aux. In] / [CD In] jacks on the RCS-848 Hub using optional cables.
- *Optional*—Connect the [Rec. Out] jacks on the RCS-848 Hub to the audio input(s) on the external audio recording device using optional cables.
- *Optional*—Connect the [Mon. Out] jacks on the RCS-848 Hub to the audio inputs on the external monitoring system using optional cables.

Test the Basic System

When all conference system components are placed and the cables are connected, test each component using the following procedure.

Power Up

Note: It's strongly recommended that you power up the conference components in the following order.

- Student instruments
- Teacher's instruments
- External audio playback/recording device(s)
- Visual monitors
- Computer(s)
- RCS-848 Hub
- External monitoring (speaker) system

Test the Teacher's Station

- Simultaneously press the [All] and [STUDENT MUTE] buttons on the RCS-848 conference controller to “clear all” settings.
- Set the output level on the teacher's instrument to somewhere between 50%–100%—this provides the best signal-to-noise audio response.
- Set the [TEACHER MIC] and [TEACHER HEADPHONE] sliders on the RCS-848 conference controller to somewhere between 50%–100%.
- Put on the teacher's headset and play a few notes on the teacher's instrument. You should hear what you're playing. If you don't hear anything, check the teacher's instrument and teacher's headset connections.
- Press the [TEACHER MIC] button on the RCS-848 conference controller and talk into the teacher's microphone. You should hear yourself. If you don't hear anything, check the teacher's headset connections.

Test the Student Stations

- Simultaneously press the [All] and [STUDENT MUTE] buttons on the RCS-848 conference controller to “clear all” settings.
- Press the [All] button on the RCS-848 conference controller.
- Play a few notes on the teacher’s instrument while an assistant listens at Student Station #1. The assistant should hear what you’re playing. If the assistant doesn’t hear anything, check the RCS-1 interface box-to-RCS-848 Hub [1] connections.
- Have the assistant adjust the output level on Student Instrument #1 to somewhere between 50%–100%—this provides the best signal-to-noise audio response).
- Have the assistant play a few notes on Student Instrument #1. The assistant should hear what he or she’s playing. If the assistant doesn’t hear anything, check the student instrument-to-RCS-1 interface box connection(s).
- Have the assistant say something. You and the assistant should hear what he or she is saying.
- If needed, make RCS-1 interface box level adjustments with the [Inst. Level L/R] adjusters on the side of the RCS-1 interface box using a small screwdriver. All interface boxes should be adjusted to similar audio levels.
- Repeat the steps above for each remaining student station.

Secure the Components and Cables

If all of the components are functioning properly, finalize the placement of all equipment and secure equipment and cables as follows.

- Attach each RCS-1 interface box to the furniture or student instrument, near the headphone jack on the instrument, using screws, Velcro, or double-sided tape.
- Secure all communication cables by either tying them together or placing them in wiring channels to avoid hazards in the classroom setting.
- Care should be taken to make sure that all cords and cables are secured in a neat and orderly fashion to prevent students from tripping over them and pulling them out of their sockets. This can cause serious damage to the RCS-848.

Chapter 2: Operating the RCS-848

The RCS-848 Conference Controller is the heart of the RCS-848 Conferencing System. It provides routing capabilities similar to those found in a telephone switchboard. For example, when a teacher needs to hear a particular student, or group of students, he or she can do so using the RCS-848 Conference Controller. When a teacher needs to arrange the class into four groups of four students for quartet-style playing, he or she can do so from the RCS-848 Conference Controller. While rewiring the conference system for alternate configurations may seem difficult, it's actually as simple as pressing one or two buttons. With the RCS-848, the following applications are all possible from the Conference Controller.

Initialize the System Using [ALL CLEAR]

At any time, the RCS-848 can be reset to its factory default settings using the [ALL CLEAR] button combination. To do this, simultaneously press the [All] and [STUDENT MUTE] buttons. This turns off all of the lights on the RCS-848 Conference Controller and instantly creates an individual student practice system.

Create an Individual Student Practice System



Students Hear:

Their instrument and microphone, unless [STUDENT MUTE] is engaged.



Teacher Hears:

The teacher's instrument and microphone.

This is the default mode of the RCS-848. Simultaneously press the [All] and [STUDENT MUTE] buttons to establish an individual student practice system.

Communicate with the Class (One-Way Communication)



Students Hear:

Their instrument and microphone.
The teacher's instrument and microphone.



Teacher Hears:

The teacher's instrument and microphone.

[TEACHER HEADPHONE] Slider

Use this slider to control the listening level in the teacher's headphones. Slide the slider towards the top of the RCS-848 to increase the listening level and slide the slider towards the bottom of the RCS-848 to decrease the listening level. Place the slider approximately halfway between the minimum and maximum positions to start.

[TEACHER MIC] Button

Use this button to turn the teacher's microphone on and off. Be sure the [TEACHER MIC] button is engaged when communicating with students, pairs, groups, or the entire class.

[TEACHER MIC] Slider

Use this slider to control the teacher's microphone level. Slide the slider towards the top of the RCS-848 to increase the teacher's microphone level, and slide the slider towards the bottom of the RCS-848 to decrease the teacher's microphone level. Place the slider approximately halfway between the minimum and maximum positions to start.

Teacher Instrument Level

Use the volume knob, slider, or buttons on the teacher's instrument to control the teacher's instrument level. Be sure to find a suitable level balance between the teacher's microphone and the teacher's instrument. Place the volume slider, knob, or buttons approximately halfway between the minimum and maximum positions to start.

[All] Button

Use this button to establish one-way communication with all students. The [TEACHER MIC] button must be engaged to activate the teacher's microphone.

[STUDENT MUTE] Button

Use this button to temporarily disable (mute) all student instruments. This button is especially useful when undivided student attention is desired.

Communicate with a Single Student (Two-Way Communication)



Selected student hears:

His or her instrument and microphone.
The teacher's instrument and microphone.



Teacher hears:

The teacher's instrument and microphone.
The selected student's instrument and microphone.



Unselected students hear:

Their instrument and microphone.

Student [1-8] Buttons

Use these buttons to establish two-way communication between a student and the teacher. The [TEACHER MIC] button must be engaged to activate the teacher's mic.

[Bank] Button

Use this button to access the controls for additional students (e.g. students "9-16," "17-24," etc.)

Create Student Groups or Pairs

To add a student to a group for practice and/or performance, hold down one of the [GROUPS A, B, C, D] buttons and select group members using the Student [1–8] buttons—use the [Bank] button to access the Student [1–8] buttons for additional students. This establishes two-way communication between the selected students.

To remove a student from a group, hold down the [GROUPS A, B, C, D] button that corresponds to the student’s group and deselect the student using the Student [1–8] buttons—use the [Bank] button to access the Student [1–8] buttons for additional students.

To create a quick-and-easy pairing of adjacent students (i.e. Student 1 with Student 2, Student 3 with Student 4, etc.), press the [Pairs] button. This establishes two-way communication between adjacent students. This button overrides the [GROUPS A, B, C, D] buttons.

Communicate with Student Groups or Pairs (Two-Way Communication)



Selected student hears:

His or her instrument and microphone.
The teacher’s instrument and microphone.



Teacher hears:

The teacher’s instrument and microphone.
The selected student’s instrument and microphone.



Unselected students hear:

Their instrument and microphone.

Student [1–8] Buttons

Use these buttons to establish two-way communication between selected students and the teacher. The [TEACHER MIC] button must be engaged to activate the teacher’s microphone.

[GROUPS A, B, C, D] Buttons

Once a student group has been created (see *Create Student Groups or Pairs* above), use these buttons to establish two-way communication between the selected group(s) and the teacher. The [TEACHER MIC] button must be engaged to activate the teacher’s microphone.

[Pairs] Button

When the [Pairs] button is engaged, use the Student [1–8] buttons to establish two-way communication between selected pairs and the teacher. For example, press the Student [1] button to select the Student 1 + Student 2 pair. Press the Student [3] button to select the Student 3 + Student 4 pair. The [TEACHER MIC] button must be engaged to activate the teacher’s microphone.

Broadcast a Student's Performance to the Class



Selected student(s) hears:

- Their instrument and microphone.
- The teacher's instrument and microphone.



Teacher hears:

- The teacher's instrument and microphone.
- The selected (broadcasting) student's instrument and microphone.



Unselected students hears:

- Their instrument and microphone.
- The teacher's instrument and microphone.
- The selected (broadcasting) student's instrument and microphone.

To broadcast a student's performance to the class, use the Student [1–8] buttons to select the student(s) to be broadcast—use the [Bank] button to access the Student [1-8] buttons for additional students—and then press the [STUDENT BROADCAST] button.

Broadcast an External Audio Source to the Class



Students hear:

- Their instrument and microphone.
- The external audio source.



Teacher hears:

- The teacher's instrument and microphone.
- The external audio source.

[CD INPUT] Button

Use this button to broadcast the [CD In] audio source to the class. Pressing this button cancels the [AUX. INPUT] button. Use the [CD/AUX] slider to adjust the volume level of the [CD In] audio source.

[AUX. INPUT] Button

Use this button to broadcast the [Aux. In] audio source to the class. Pressing this button cancels the [CD INPUT] button. Use the [CD/AUX] slider to adjust the volume level of the [Aux. In] audio source.

Record / Playback a Class Performance

Make sure an external recording device is connected properly. The [Rec. Out] connectors on the RCS-848 Hub should be connected to the inputs of the external recording device. This makes recording possible. The outputs on the external recording device should be connected to the [Aux. In] inputs on the RCS-848 Hub. This makes playback possible.

To record a class performance, use the Student [1–8] buttons to select the student(s) to be recorded—use the [Bank] button to access the Student [1-8] buttons for additional students. During rehearsal, adjust the input level on the external recording device. When rehearsal is complete, press the Record button on the external recording device and have the student(s) perform. When the performance is completed, press the Stop button on the external recording device.

To play back a class performance, press the [Aux. Input] button, cue the performance on the external recording/playback device, press the Play button on the external recording/playback device, and adjust the playback level using the RCS-848's [CD/Aux] slider.

Use an External Monitoring (Speaker) System

Make sure the external monitoring (speaker) system is connected properly. The [Mon. Out] connectors on the RCS-848 Hub should be connected to the inputs on the external monitoring system. Set the volume on the external monitoring system to a moderate level.

While the conferencing system is in use, use the RCS-848's [Monitor] slider to adjust the overall level being sent to the external monitoring system. Slide the slider towards the top of the RCS-848 to increase the overall level and slide the slider towards the bottom of the RCS-848 to decrease the overall level. Place the slider approximately halfway between the minimum and maximum positions for optimum performance.

Readjust the level control of the external monitoring system itself as needed.

Appendix A: Specifications

RCS-848 Hub Connectors

Student Inputs	RJ-45 (8-conductor telephone-type) <i>Note: Do not use Cat 5 cable</i>
Aux. In	(2) RCA unbalanced mono
CD In	(2) RCA unbalanced mono
Rec. Out	(2) RCA unbalanced mono
Mon. Out	(2) RCA unbalanced mono
Teacher	RJ-45 (8-conductor telephone-type) <i>Note: Do not use Cat 5 cable.</i>
Remote	RJ-45 (8-conductor telephone-type) <i>Note: Do not use Cat 5 cable</i>
Power	9 Volts AC, 4 Amps <i>Note: Use Supplied AC Adapter only</i>

RCS-1 Student/Teacher Interface Box Connectors

Instrument	right, left (accepts mono or TRS input)
Student 1	
Mic	1/8" mini-phone, condenser-type
Phones	1/8" mini-phone stereo
Student 2	
Mic	1/8" mini-phone, condenser-type
Phones	1/8" mini-phone stereo
Audio In	1/8" mini-phone stereo
Audio Out	1/8" mini-phone stereo
To Hub	RJ-45 (8-conductor telephone type) <i>Note: Do not use Cat 5 cable</i>

Other

RCS-848 Includes

(1) RCS-hub, (1) RCS-848 conference controller, (9) RCS-1 interface boxes, (9) RCS-HS stereo headsets, (9) 1/4" to 1/4" TRS cables, (10) RJ-45 (8-conductor telephone-type) cables, (1) AC adapter, and (1) owner's manual

Options

RCS-8EXP expansion kit includes: (1)8-student expansion card, (8) RCS-1 interfaceboxes, (8) RCS-HS stereo headsets, (8) 1/4" to 1/4" TRS cables, and (8) RJ-45 (8-conductor telephone-type) cables

RCS-HS headset

RCS-1 student/teacher interface box

Appendix B: Make Your Own RJ-45 (8-Conductor Telephone-Type) Cables

Required Tools and Parts

Crimper

You'll need a crimping tool such as the Paladin Tools All-In-One Telephone Tool. For more information, visit: <http://www.paladin-tools.com/alseroofcrimt.html> or <http://dkc3.digikey.com/PDF/T043/0162.pdf>.

Connectors

You'll need two standard CAT5 RJ45 plugs per cable such as DigiKey P/N A-9094-ND (Amp Connector P/N 5-554739-3). For more information, visit: <http://dkc3.digikey.com/PDF/T043/0158.pdf>.

Cable

You'll need an I/O interconnect cable such as a DigiKey P/N H0082-X-ND. For more information, visit: <http://dkc3.digikey.com/PDF/T043/0156.pdf>

Procedure

1. Skin the cable jacket approximately 1" (or slightly more) from the end of the cable.
2. Straighten each wire.
3. Make a mark on the wires at 1/2" from the end of the cable jacket.
4. Hold the wires tightly between your thumb and forefinger. Cut all of the wires straight across (we suggest using a pair of scissors for this). After making your cut, be sure there's 1/2" of wire sticking out from the end of the cable jacket. *Note: This is a very critical step. If the wires are cut unevenly, or too short, they may not make proper contact with the connector.*
5. With the RJ45 connector's gold pins facing up, insert the prepared wires into the back of the connector. Apply a moderate amount of pressure on the cable to ensure that all of the wires reach the end of the connector without touching each other. Examine the connector to make sure that each wire is pushed completely over its gold pin.
6. Be sure that about 3/16" of the cable jacket goes into the back of the connector (this provides additional strength to the connector when crimped). If the wires are so long that the jacket does not reach the connector, then remove the connector and return to Step 3 above.
7. Place the wired connector into a crimping tool, and squeeze until the crimping tool is completely closed—then let go to release the connector. Most crimping tools don't spring back to the open position automatically, so you may need to squeeze the crimping tool again to release the connector.

Appendix C: Limited Factory Warranty

Headsets

The RCS-HS headsets included with the RCS-848 are warranted to be free of defects in materials or workmanship for a period of 90 days from the date of purchase.

This warranty is non-transferable and the benefits apply to the original owner. Proof of purchase in the form of an itemized sales receipt is required for warranty coverage.

To receive warranty headset service or replacement, send the defective headset (prepaid) to: Roland Headset Return, 142 Arena St., El Segundo, CA 90245. Please include the following: dated copy of the sales receipt, return name and address (no P.O. Boxes, please), your phone number or email address so that we can contact you if necessary, and a brief description of the problem. Warranty service or replacement headsets will be shipped freight prepaid within the United States, within 5 business days of receipt.

System

This RCS-848 is warranted to be free of defects in materials or workmanship for a period of 12 months from the date of purchase.

This warranty is non-transferable and the benefits apply to the original owner. Proof of purchase in the form of an itemized sales receipt is required for warranty coverage.

To receive service under this warranty, customers in the United States should contact Roland Corp. US at (323) 890-3700 and talk to Product Support or Customer Service. If necessary, a Return Authorization number may be issued.

For customers outside the United States, it's recommended that you first contact your Dealer or Distributor, since they may offer their own service or support policy.

If local support is not obtainable, please contact Roland's Service Department at (323) 890-3700 with a detailed description of the service required.

Upon issuance of return authorization, the product should be properly packed and shipped to Roland Service Department, 4901 Alexander St., Los Angeles, CA 90040-3023.

Please include the following: copy of the sales receipt, your name and address (no P.O. Boxes, please), a brief description of the problem, and any other related items discussed with the service department and considered necessary to evaluate the product or effect a repair. The return authorization number must be clearly written on the outside of the package.

Roland will, without charge for parts or labor, either repair or replace the defective part(s). Shipping costs are not covered by this warranty.

Roland's normal repair turn around time at the factory is approximately 15 business days, from receipt of product to shipping. Your actual turn around time will include return shipping.

Appendix C: Limited Factory Warranty

Actual turn around time will vary depending upon many factors including the repeatability of the customer's reported complaint, the availability of parts required for repair, the availability of related products needed to evaluate the product if necessary.

Priority services are available. These should be discussed with Customer Service at the time the return authorization is issued.

This warranty provides only the benefits specified and does not cover defects or repairs needed as result of acts beyond the control of Roland including but not limited to: abuse, damage by accident/negligence, modification, alteration, improper use, unauthorized servicing, tampering, or failure to operate in accordance with the procedures outlined in the owner's manual; nor for acts of God such as flooding, lightning, tornadoes, etc.

THE DURATION OF ANY OTHER WARRANTIES, WHETHER IMPLIED OR EXPRESS, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN. ROLAND HEREBY EXCLUDES INCIDENTAL AND CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO: LOSS OF TIME, INCONVENIENCE, DELAY IN PERFORMANCE OF THIS WARRANTY, THE LOSS OF USE OF THE PRODUCT OR COMMERCIAL LOSS, AND FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY, APPLICABLE TO THIS PRODUCT. ROLAND SHALL NOT BE LIABLE FOR DAMAGES OR LOSS RESULTING FROM THE NEGLIGENT OR INTENTIONAL ACTS OF THE SHIPPER OR HIS CONTRACT AFFILIATES. THE CUSTOMER SHOULD CONTACT THE SHIPPER FOR PROPER CLAIMS PROCEDURES IN THE EVENT OF DAMAGE OR LOSS RESULTING FROM SHIPMENT.

