SONY

Installation Manual

New Home Entertainment Solutions

INSTALLATION

Contents

Who should use this manual?

This manual is intended for professional Custom A/V installers only. Installation should only be performed by licensed, bonded and fully insured contractors. Workers should be completely versed in the following areas:

- *The National Electric Code (NEC) and any additional local code requirements.*
- *Any local requirements for job permits and inspections.*
- *Any local requirements for cable in conduit.*
- *Proper selection of UL-listed cables with an appropriate CL rating for in-wall wiring.*
- *Pulling and terminating domestic low-voltage wiring.*
- *Avoiding services such as AC wiring, plumbing, water, sewer or gas when routing cables.*
- *Preventing electrical shock hazards that occur when low-voltage wiring shorts out an AC circuit.*
- *Preventing fire hazards associated with in-wall wiring.*
- *Preventing damage to structural members (studs, joists, floor plates, etc.) from excessive drilling or notching.*
- *Protecting in-wall wiring that runs close to the surface from nails through the wallboard.*
- *Requirements for electrical grounding of AC powered equipment and incoming service feeds.*
- *On-site safety practices, including tool and belt safety; head, eye and body protection, job cleanliness and neatness.*
- *Coordination of work with the builder and other sub-contractors.*
- *Any additional health and safety requirements defined by local law.*
- *Any additional installation requirements defined by the type of construction.*

Installation should not be attempted by persons not meeting the above requirements.

Caution

Follow all instructions included with the A/V components, remote controllers, in-wall keypads and in-wall volume controls that compose the Sony New Home Entertainment Solutions.

Three stages of installation

Depending on the needs of the builder and the homebuyer, installation generally takes place in the following three stages:

Planning.

Generally occurs before or during the framing of the house. The builder, installer and the homebuyer sit down to determine the precise system and options. Decisions are made on a room-by-room basis. The result is a detailed wire plan that indicates the locations of the System Rack, all wall control panels, in-wall speakers, wall plates for RF, audio, video and speaker wiring; the main theater room television and main theater room free-standing speakers.

Pre-Wiring.

Generally occurs after framing, plumbing and electrical installation and before drywall installation. The installer locates junction boxes and runs cable.

Installation.

Generally occurs after painting and before final inspection. The installer tests all wiring, installs all in-wall control panels, wall plates, in-wall speakers and installer-supplied A/V equipment.

Planning

The purpose of planning is to itemize all the equipment, features and functionality of the system. Since the plan obviously determines the system's final price, planning is typically conducted in consultation with the builder and homebuyer. The planning process encompasses the following decisions:

- **Confirm all A/V component purchases** including the New Home Entertainment Solution itself, any television required for the main room and any additional speakers, televisions or A/V source components.

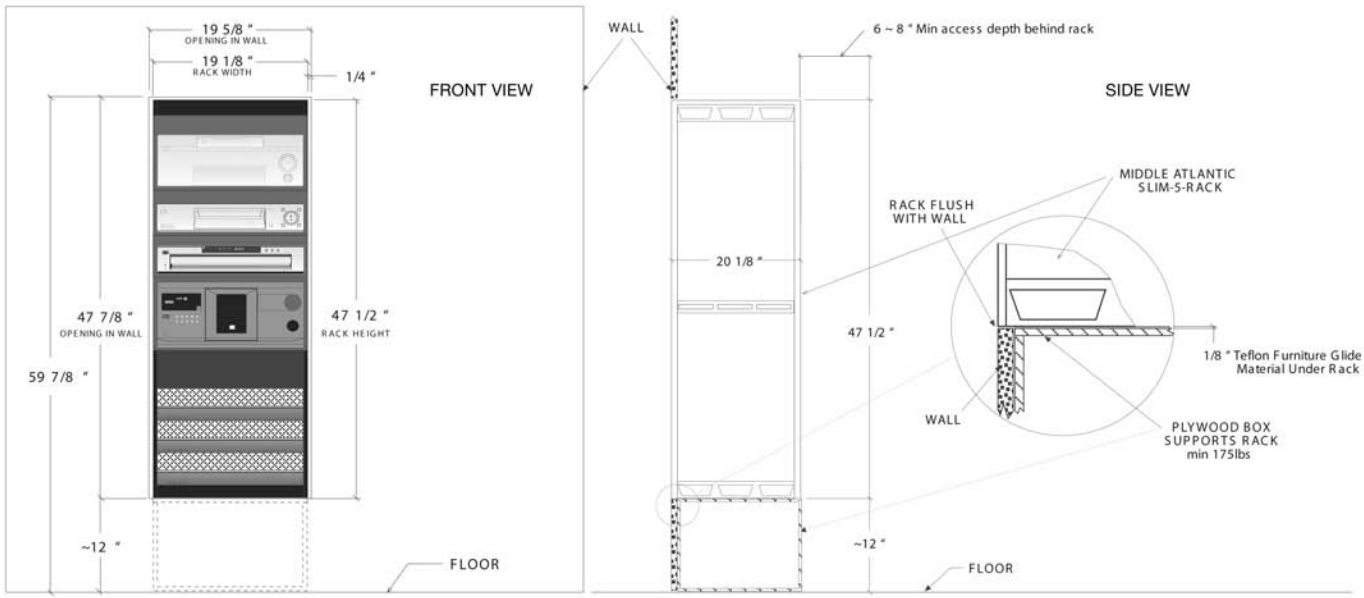
- **Itemize the services** for each room, including RF distribution, if necessary.
  IMPORTANT NOTE: If you are distributing RF output from a single, centralized Cable TV, Satellite TV or High Definition TV set-top box, remote room keypads will NOT be able to select TV channels. Customers in remote rooms will only be able to watch channels already selected in the main room set-top box. If the customer wants full channel selection in every room, you must distribute the incoming RF signal to set-top boxes in every room. In this case, the customer can use the remote for each set-top box to select channels and use the television remote control to adjust volume. Sound from the set-top box will be heard only through the remote room television's built-in speakers, not the system speakers.

- **Determine the need for cable or satellite TV service,** if necessary.

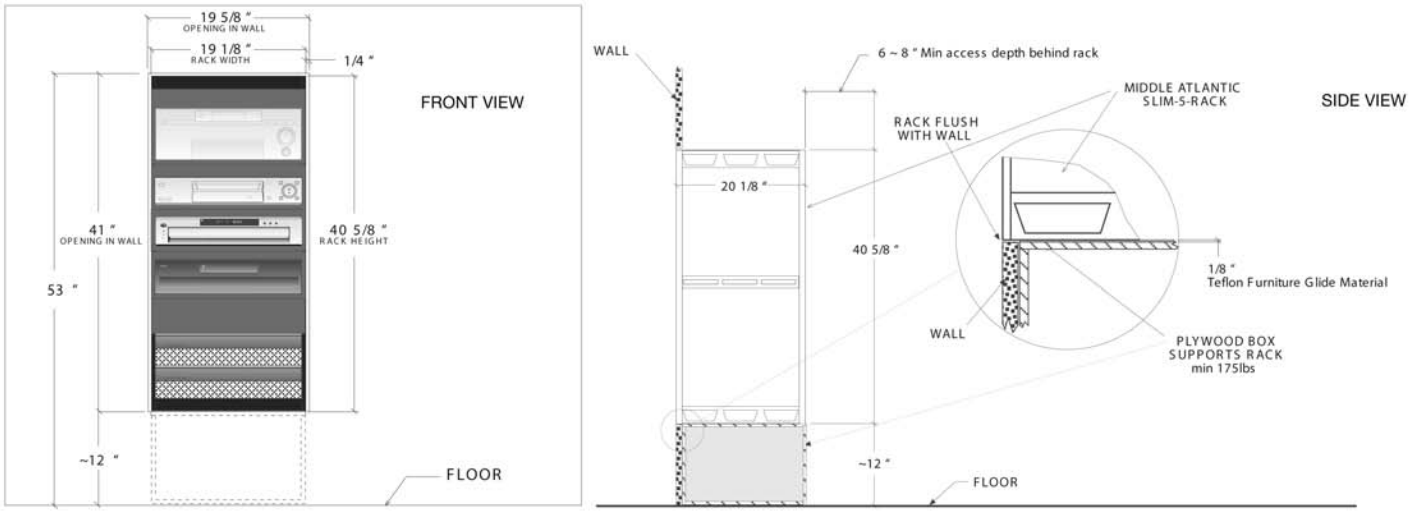
- **Determine the owner's preferences for AM/FM preset stations,** You will later program these into the A/V receiver.

- **Locate the System Rack,** which typically goes into a wall cavity in or near the home theater room or in an entertainment cabinet.
  - You will need to build a plywood box to support the rack off the floor. Furnish 1/8-inch Teflon furniture glide material to ease rack installation. See the following chart for plywood box dimensions and support capacity.
  - The rack requires a front opening of 19-5/8 inches wide and a minimum depth of 26 to 28 inches. This will allow 6 to 8 inches of clearance in back for ventilation. See the following chart for rack opening height, measured from the top of the plywood box.
  - If you plan to put the rack in a finished soffit, plan to provide a hole of 6 inches minimum diameter at the top-back or top-side for ventilation and a second hole, 12 inches square in the back for cable access.

System	NHS-703	NHS-502	NHS-301
Plywood Box, minimum support capacity	225 pounds	225 pounds	225 pounds
Plywood Box, dimensions	12" H x 19-1/8" W x 20-1/8" D	12" H x 19-1/8" W x 20-1/8" D	12" H x 19-1/8" W x 20-1/8" D
Rack Opening, width	19-5/8"	19-5/8"	19-5/8"
Rack Opening, minimum height, as measured from top of plywood box	47-7/8"	41"	29-1/4"
Rack Opening, minimum depth	26"	26"	26"

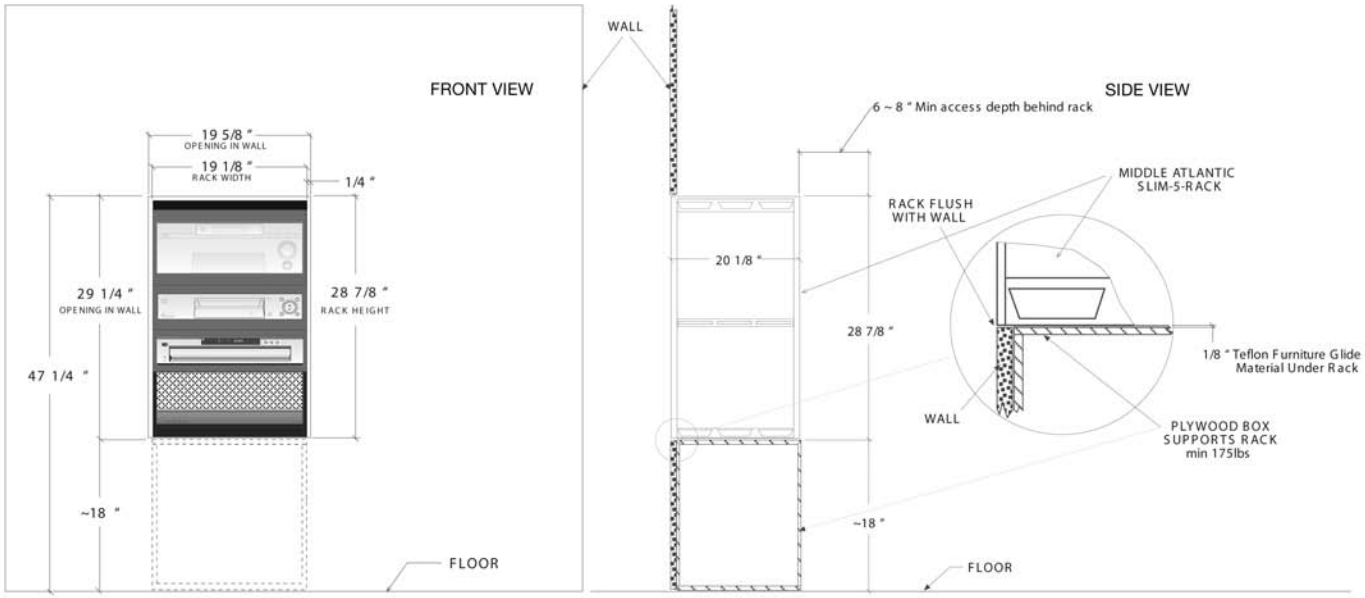


Front and side views of the NHS-703 system rack, indicating required plywood box (not supplied) and required clearance behind rack.



Front and side views of the NHS-502 system rack, indicating required plywood box (not supplied) and required clearance behind rack.

Planning



Front and side views of the NHS-301 system rack, indicating required plywood box (not supplied) and required clearance behind rack.

- **Determine the need for an infrared repeater connection.** If the NHS-703 or NHS-502 System Rack will be hidden with no "line of sight" from users holding the infrared remote control in the main room, you must provide an infrared repeater connection from the main room to the System Rack.

  NOTE: This repeater connection is not covered by the Sony warranty.

- **Itemize electrical service.**
  - Provide a DEDICATED, 20 amp circuit with a grounded duplex outlet at the System Rack location.
  - Provide a 15 amp grounded duplex outlet for the home theater room television and the home theater room subwoofer.
  - Provide a 15 amp grounded duplex outlet for the television in each remote room.

- **Home theater room design.**
  - Determine the location for the main television.
  - Determine the number of surround speakers. Sony receivers can accommodate either 5.1-channel or 7.1-channel sound.
  - Determine the location for the surround sound speakers (Left, Center, Right, Left Surround, Right Surround, Left Surround Rear, Right Surround Rear and Subwoofer).

- **Remote rooms.** Determine locations for all in-wall control panels, connected televisions, in-wall speakers and free-standing speakers, plus wall plates for RF (if added), video and speaker wiring.

Once the homebuyer agrees to your plan, document the plan for installation. Prepare at least the following three documents:

1. **A wire plan.** This is a mark-up of the house blueprints indicating the locations of the System Rack, all wall control panels, in-wall speakers, wall plates for RF, audio, video and speaker wiring; the main theater room television and main theater room free-standing speakers.
2. **A wire list.** This should assign a unique number to every cable you plan to run and include an approximate length in feet, allowing for a five foot service loop at the System Rack and a two-foot service loop at the far end in-wall location. You can later add up the lengths to estimate the total amount of cable required.

What Sony provides

Sony New Entertainment Solutions come equipped with the following parts and supplies only:

- *The system rack.*
- *System rack A/V components.* These include an A/V receiver, DVD/CD changer, VHS recorder and, in the case of the NHS-703 and NHS-502, a CD-only changer.
- *System rack internal wiring.*
- *System rack infrared control units,* as required.
- *System rack utility amplifiers,* as required to power remote room speakers.
- *Main room infrared remote control.*
- *In-wall keypads and volume controls.*
- *Individual component remote controls.* For the Sony components in the system rack.
- *Individual component operating instructions.* For the Sony components in the system rack.

System	NHS-703	NHS-502	NHS-301
Number of rooms	7 (Main + 6)	5 (Main + 4)	3 (Main + 2)
Number of zones	3	2	1
Remote rooms with audio and video from main system	3	3	-
Remote rooms with audio only	3	1	2
In-wall remote controls	6	4	-
In-wall volume controls	6	4	-
In-wall muting volume controls	-	-	2
Sony receiver	Yes	Yes	Yes
Sony DVD/CD changer	Yes	Yes	Yes
Sony CD changer	Yes	Yes	-
Sony VHS VCR	Yes	Yes	Yes

What you must provide

To ensure a smooth pre-wire process, we recommend that you assemble the following materials.

- *Wire plan, wire list and parts list.*
- *Cable, HD or satellite set-top box(es).* If you have determined that the customer requires one or more set-top boxes, you must arrange for them or provide them.
- *Any furniture that the system rack will go into.*
- *A plywood box for the system rack to sit upon.*
- *1/8-inch Teflon® furniture glide material* for the top of the plywood box.
- *A remote repeater connection* from the main room television to the system rack, if necessary.
  NOTE: This repeater connection is not covered by the Sony warranty.
- *Any ancillary equipment to be included in your system sale, including all speakers and televisions.*
  NOTE: This ancillary equipment is not covered by the Sony New Entertainment Solutions warranty.
- *Speaker cable.* UL listed with an appropriate CL rating for residential in-wall installation. Check local building and electrical codes for specific requirements. We recommend 14 gauge cable, which serve runs of up to 200 feet from amplifier to speaker. Use 2-conductor (14-2) and 4-conductor (14-4) cable as appropriate.
- *Cat 5 cable.* For DC, control and infrared signals, you must provide Cat 5 cable UL listed with an appropriate CL rating for residential in-wall installation. Check local building and electrical codes for specific requirements.
- *RG6 Coaxial cable.* For RF television signals, composite video and line-level audio, you must provide quad shield RG-6 coaxial cable UL listed with an appropriate CL rating for residential in-wall installation. Check local building and electrical codes for specific requirements.
- *Audio/video cables.* For connecting free-standing A/V components to wall plates.
- *RJ-45 crimp connectors.* For Cat 5 cables.
- *"F-type" crimp connectors.* For RG6 coaxial cables.
- *RCA crimp connectors.* For audio/video cables.
- *Dual banana plugs.* For speaker cables.
- *Labeling tape* to identify both ends of each cable according to the designations in the wire list.
- *Single-, dual-, and triple-gang junction boxes or speaker mud rings* will enable you to rough-in the in-wall control panels and wall plates.
  NOTE: The in-wall control panels of the NHS-703 and NHS-502 require 3-gang junction boxes of 54 cubic inches or larger. The in-wall muting volume controls of the NHS-301 require single-gang junction boxes of 18 cubic inches or larger.
- *Single-, dual-, and triple-gang wall plates.*
- *Cable ties and supports* to safely secure cable runs in attics and crawl spaces. This will help prevent damage to the cables from other construction tradesmen.
- *Rough-in boxes* for all in-ceiling or in-wall speakers.
- *Clear plastic wrap* to protect cable connectors from contamination.

Pre-wiring

Pre-wiring generally occurs after framing, plumbing and electrical installation and must occur before drywall installation prevents access to the wall cavities.

Special tools

In addition to all the standard electrician's tools, home theater installation requires the following:

- *Cat 5 Cable stripper/crimper*
- *RCA Connector stripper/crimper*
- *RG6 Coax stripper*
- *'F' Connector crimper*
- *Cable testers for Cat 5 and RG6*

Notes for pre-wiring

1. *Documentation.* Confirm that you have the wiring plan, wire list and parts list that you created in the planning stage.
2. *Home run wiring.* Except as noted, all wiring is "home run," connecting remote equipment directly to the main System Rack. Except as noted, there is no "daisy-chaining" of system components.
3. *Service loops.* During installation, you will position the System Rack outside the wall, connect all cables and insert the rack into place. For this reason, you must provide a substantial service loop of slack cable. We recommend a five-foot service loop for all cables at the System Rack, and a two-foot service loop at all other locations.
4. *Avoiding AC wires and junction boxes.* As usual, do not run low-voltage wires through the same drill holes as AC wires. Do not place low-voltage wall plates and in-wall control panels in the same junction boxes as AC. In addition to all the usual safety considerations, AC wires radiate 60-Hz "hum" and switching transients that can degrade system performance. Where low-voltage cables run parallel to AC wires for more than five feet, maintain two feet minimum separation. Where low-voltage cables cross AC wires, they should do so at a 90-degree (right) angle, to minimize hum.
5. *Cable labels.* Both ends of all cables should be labeled according to their designations in the wire list. This will prevent confusion and time-consuming wire tracing during the installation. It will also expedite any service calls or additional installations in the future.
6. *Protecting plugs and connectors.* Your pre-wiring will be followed by wallboard installation, plastering, priming, painting, wallpapering, floor installation and floor finishing. These potentially messy processes can ruin your cable connectors with plaster, paint, dust and other contaminants. To save yourself work later on, protect your cables ends with clear plastic wrap. Protect your cables by coiling the service loops back into wall openings and junction boxes.

Home Theater Room: Speakers

1. Identify locations for all speakers: Left, Right, Center, Left Surround, Right Surround, Left Surround Rear, Right Surround Rear and Subwoofer.
2. Confirm that a 15 amp grounded duplex outlet is available to power the Subwoofer.
3. Install junction boxes or mud rings for all wall plates that serve free-standing speakers.
4. Install rough-in boxes for all in-wall and in-ceiling speakers.
5. Run 14-gauge, 2-conductor (14-2) speaker cable from the Left, Right, Center, Left Surround, Right Surround, Left Surround Rear and Right Surround Rear speaker locations to the System Rack.
6. Run an RG6 cable from the Subwoofer location to the System rack.
7. Terminate the Subwoofer cable with an F-connector and F-connector-to-RCA plug adaptor on both ends.
8. Label all cables at both ends.

Home Theater Room: Television

1. Identify the location for the television.
2. Confirm that a 15 amp grounded duplex outlet is available to power the television.
3. If the System Rack will be hidden with no “line of sight” from viewers holding the infrared remote control in the main room, you must install an infrared repeater cable.
   NOTE: This repeater cable is not covered by a Sony warranty.
4. Install a junction box for the television wall plate. You will need a single- or dual-gang junction box, depending on the wall plate system you choose and whether your connection includes an infrared repeater cable. Some wall plate systems accommodate a maximum of four cables per panel. Other systems can accommodate up to eight cables per panel. The television connection will involve seven cables or eight cables if you are installing an infrared repeater cable.
5. Run the following cables from the television location to the System Rack:
   A. Seven RG-6 coaxial cables, one each for
      I. RF input
      II. Composite Video input
      III. Red (Pr) input
      IV. Green (Y) input
      V. Blue (Pb) input
      VI. Audio Left input
      VII. Audio Right input
   B. Cat 5 infrared repeater cable (if necessary)
6. Label all cables at both ends.
7. Strip and terminate all cables at both ends as follows:
   A. Composite Video, Red (Pr), Green (Y), Blue (Pb) and Audio Left and Audio Right cables take F-connectors and F-connector-to-RCA plug adapters.
   B. RF coaxial cable takes F-connectors.
   C. Cat 5 infrared repeater cables take 1/8-inch mini male phone plugs, with the White/Orange conductor connected to the tip and the Orange conductor connected to the sleeve.

Remote Room: Volume Controls and Keypads

The number of in-wall volume controls and keypads you will need to install depends on the specific system. Please refer to the chart below for details.

System	NHS-703	NHS-502	NHS-301
Number of rooms	7 (Main + 6)	5 (Main + 4)	3 (Main + 2)
Number of zones	3	2	1
Remote rooms with audio and video from main system	3	3	-
Remote rooms with audio only	3	1	2
In-wall remote controls	6	4	-
In-wall volume controls	6	4	-
In-wall muting volume controls	-	-	2

For NHS-703 and NHS-502

1. Confirm the locations of all in-wall remote controls on the wire plan.
2. Install 3-gang junction boxes, 54 cubic inches or larger in every remote room for the in-wall remote controls and in-wall volume controls.
3. Run two cables from each junction box to the System Rack location:
4. One 14-gauge, 4-conductor (14-4) speaker cable.
5. One Cat 5 remote control cable.
6. Label all cables on both ends.

For NHS-301

1. Confirm the locations of both in-wall muting volume controls on the wire plan.
2. Install single-gang junction boxes, 18 cubic inches or larger, in both remote rooms for the in-wall muting volume controls.
3. Run one 14-gauge, 4-conductor (14-4) speaker cable from both junction boxes to the System Rack location
4. Label both cables on both ends.
5. To supply DC power to the muting volume controls, run one Cat 5 cable from both junction boxes to the System Rack location.
6. Label both wires for DC power at both ends.

Pre-wiring

Remote Room: Speakers

1. *NOTE!* Unlike other connections in this manual, remote room speakers are NOT wired in “home run” configuration to the System Rack. The speakers are wired to the in-wall volume control in each room. In the NHS-703 and NHS-502, the volume control connects to the keypad, which you connect to the amplifier in the system rack. In the NHS-301, you connect the muting volume control directly to the system rack.
2. Confirm the locations of all in-ceiling, in-wall and free-standing speakers in the remote rooms.
3. Install rough-in boxes for all in-ceiling and in-wall speakers.
4. Install junction boxes or mud rings for the speaker wall plates for all free-standing speakers.
5. Run one 14-gauge, 2-conductor (14-2) speaker cable from the Left and Right speaker locations to the location of the in-wall volume control in that room.
6. Label both cables on both ends.

Remote Room: Television

1. Confirm the locations of all televisions in the remote rooms.
2. Install junction boxes or mud rings for the television wall plates.
3. For composite video, run one RG6 coaxial cable from each television junction box to the System Rack.
4. Terminate these cables with F-connectors and F-connector-to-RCA plug adaptors.
5. If you are performing RF cable and satellite distribution, run a second RG6 coaxial cable from each television junction box to the main RF and satellite distribution point.
6. Terminate these cables with F-connectors.
7. Label all cables at both ends.

Pre-wiring: finishing touches

1. Protect your plugs with clear plastic wrap.
2. Protect your cables by coiling the service loops back into wall openings and junction boxes.
3. Document your work. Leave the wiring plan and wire list in a Zip-Loc™ style clear plastic bag in the coil of service loop wire at the System Rack location. This will make it easier to resume the job when the time comes for installation.

Installation

Installation takes place after painting and flooring. Installation must be completed before final inspection because a new home will not pass inspection while there are still holes in the walls. To ensure a smooth installation, we recommend that you assemble the following materials.

- *The System Rack,* which comes pre-assembled from Sony and includes an A/V receiver, DVD changer and VHS VCR. The NHS-703 and NHS-502 System Racks also include a CD changer. The System Rack features a wiring harness for most component-to-component connections within the rack itself along with remote repeater systems, infrared flashers, one or more stereo amplifiers and, for the NHS-703 and NHS-502 systems, an A/V distribution amplifier.
- *The Main Room television.*
- *In-wall control panels and in-wall volume controls.*
- *Any speakers you are supplying,* which can include in-ceiling, in-wall and free-standing speakers.
- *Any additional television and A/V equipment* you are supplying.
- *Cable testers* to check the continuity and accurate labeling of each cable and the integrity of each plug.
- *Wall plates.* These will need to accommodate a mix of F-connectors, RCA plugs, speaker wires and 1/8-inch miniplugs. You can choose special-purpose wall plates pre-configured with the connectors you need or modular wall plates with empty slots that you can fill with appropriate connectors at the job site.
- *Face plates* for all wall plates, in-wall remote controls and in-wall volume controls. You will need an assortment of single-, dual- and triple-gang faceplates.
- *Audio, video and RF cables* for connecting free-standing components. These should include RG6 cables with F-connectors, line-level audio cables with left/right RCA jacks, composite video cables with RCA jacks, component video (Y/Pb/Pr) cables with RCA jacks, and 14-guage speaker wire for free-standing speakers.
- *Nesting banana plugs* for the connecting remote room speaker wires to the stereo power amplifiers. These are banana plugs that accept wire from the top and other banana plugs from behind.

Start by testing all cables

Weeks have now passed since you did the pre-wiring. Many workmen have come and gone. Before you install components, controls and wall plates, make sure that the cables all work as intended and are properly labeled. Otherwise, you will spend needless hours troubleshooting faults.

Installation

About the System Rack

The System Rack is designed to speed your installation by minimizing your labor in configuring, connecting and matching equipment. Sony loads the components into the rack, secures the components in the rack with metal mounting brackets, and then wires all the components to each other and to a common "back panel," for quick and easy installation. You need to do little more than unpack the System Rack and install it.

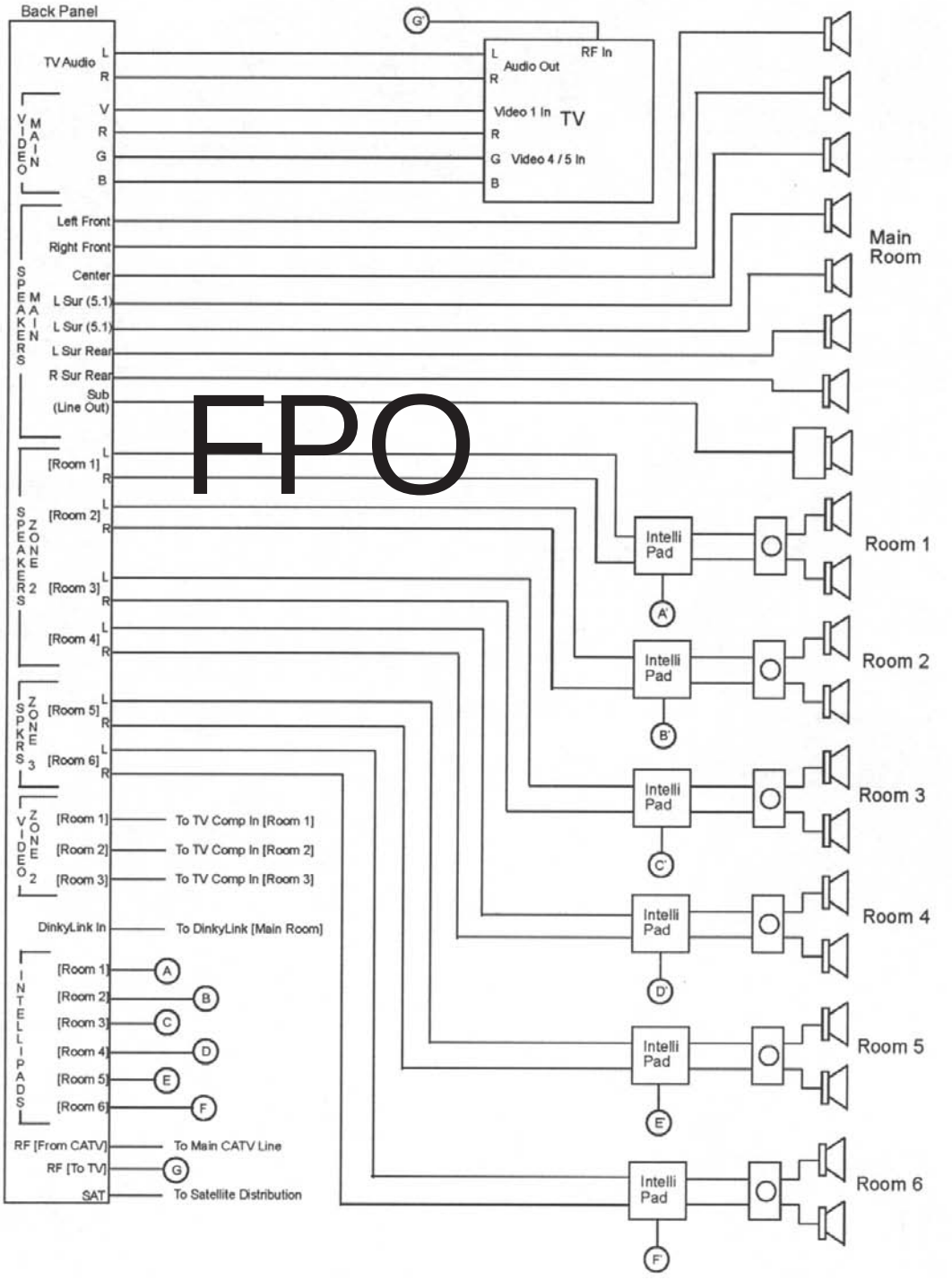
When you unpack the System Rack, carefully remove all packing materials, as directed, making sure not to disturb the cables and plugs. If you are including a cable or satellite set-top box in your system, connect it according to the following directions.

Cable / Satellite / HD Set-Top Box Connections (Optional)

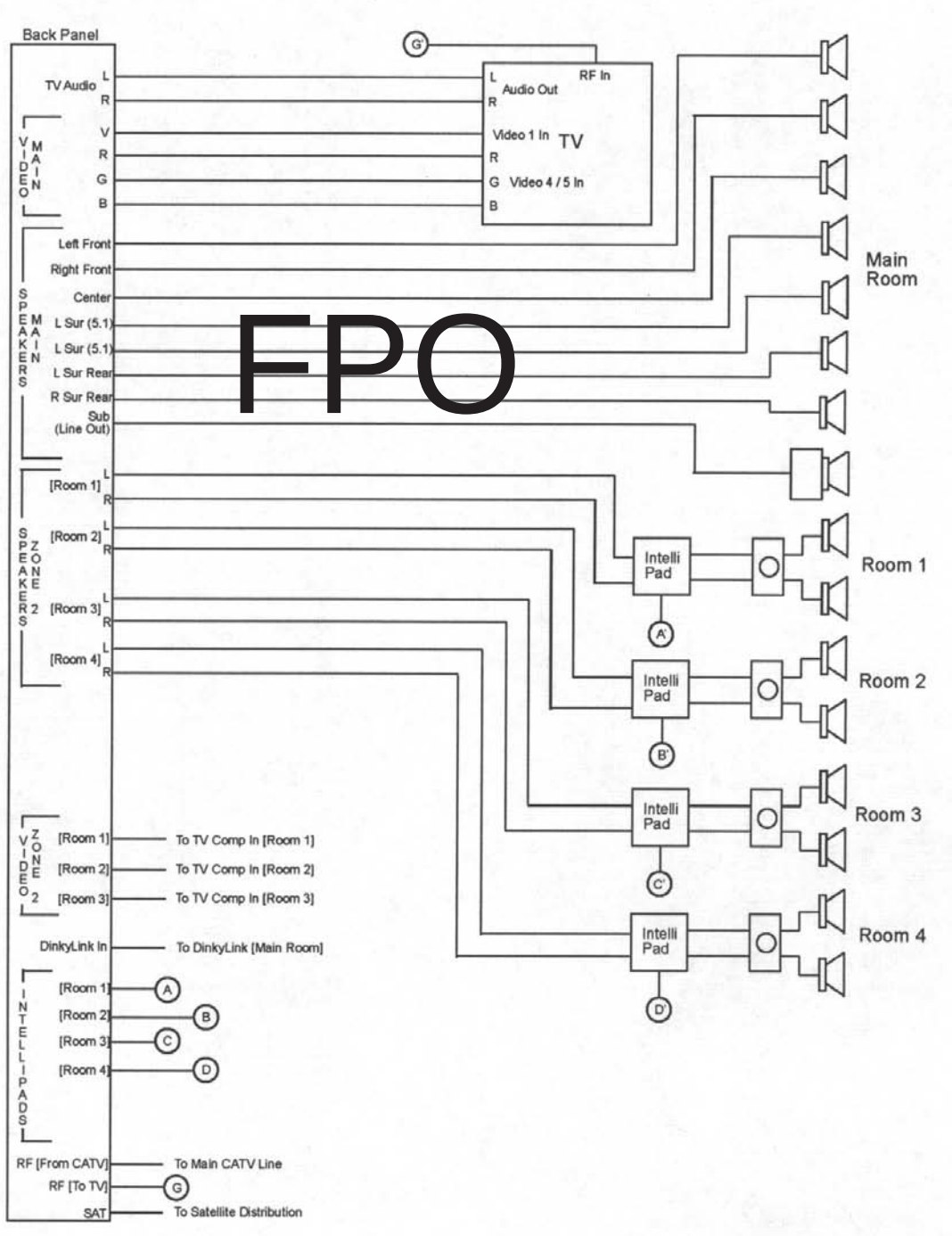
1. *NOTE:* The following instructions are for Cable/Satellite/HD set-top boxes that have component video or composite video outputs. Some older cable boxes may have RF output only. In this case, you'll be making an RF connection outside the rack. Connect the incoming cable feed to the cable box RF input. Connect the cable box RF output to the wall plate at the main room television location.
2. If you are adding an optional cable TV set-top box, connect "Output 2" from the RF splitter to the RF input of the set-top box. (Cable R4)
3. Connect the Video, Left and Right line outputs of the cable TV or satellite set-top box to the "TV/Sat" input of the receiver. Use Cables A6, A7 and V19, which are supplied in the System Rack's wiring harness.
4. If available, connect the R (Pr), G (Y), and B (Pb) outputs of the cable TV or satellite set-top box to the R (Pr), G (Y), and B (Pb) "TV/Sat" inputs of the receiver. Use Cables V6, V7 and V8, which are supplied in the System Rack's wiring harness.
5. Connect an additional self-adhesive infrared flasher from the "IR4" output of the infrared repeater unit to the infrared receiving window on the front of the cable TV or satellite set-top box. (Consult the infrared repeater unit installation manual for details on how to wire two flashers in series to a single IR output.)
6. Connect the cable TV or satellite set-top box AC cord to an AC outlet on the power strip.

Connecting the System Rack

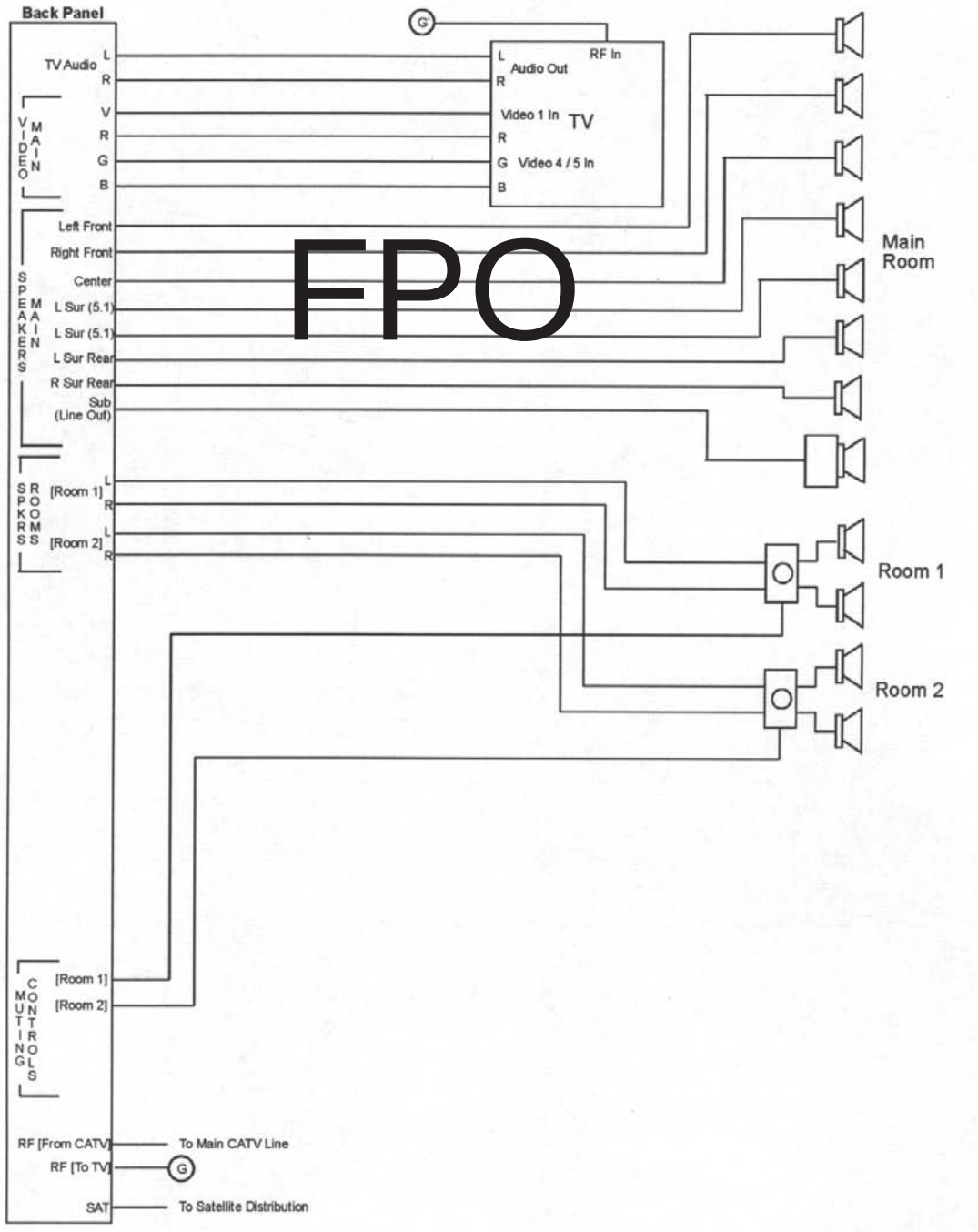
This manual provides step-by-step instructions for connecting the System Rack's common "back panel" to the other elements of your system. Before you begin, take a minute to familiarize yourself with the following connection diagrams. This will give you a general idea of the overall system design.



Overview of how the NHS-703 System Rack "back panel" connects to wall pads, volume controls, loudspeakers and your main room television.



Overview of how the NHS-502 System Rack "back panel" connects to wall pads, volume controls, loudspeakers and your main room television.



Overview of how the NHS-301 System Rack "back panel" connects to wall pads, volume controls, loudspeakers and your main room television.

Installation

Preparing the System Rack for Installation

1. Stage the System Rack close to the wall opening, on a stable platform off the floor.
2. Remove shipping lock-down fasteners located on back of rack shelves.
3. Unwind the service loop of back panel cables and connect them to the System Rack back panel.
4. Position the plywood box you've constructed in the soffit or wall cavity where the System Rack will be installed. (See the "Planning" section of this manual for details on the plywood box.)

Main Room Speakers

1. Strip 1/2 inch of insulation off all main room speaker wires. Be careful not to cut conductor strands.
2. Neatly twist the conductor strands so that they won't fray.
3. To help ensure proper sound, connect speaker wires observing consistent polarity. For every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.
4. Connect the Left, Right, Center, Left Surround, Right Surround, Left Surround Rear and Right Surround Rear speaker wires to the "Speakers Main" output terminals on the back panel.

Main Room Subwoofer

Insert the Subwoofer cable plug into the "Sub (Line Out)" jack of the back panel.

Main Room Television

1. Insert the Television Left and Right cable plugs into the "TV Audio L and R" jacks of the back panel.
2. Insert the Television Video cable plug into the "Video Main V" output jack of the back panel.
3. Insert the R (Pr), G (Y), B (Pb) Television cable plugs into the "Component Video Output" jacks of the back panel.
4. Terminate the television infrared repeater cable with a 1/8-inch mini male phone plugs, with the White/Orange conductor connected to the tip and the Orange conductor connected to the sleeve. Plug this into the TV remote repeater input of the back panel.
5. Connect the Television RF cable to the "RF [To TV]" output of the back panel.

Remote Room Speakers

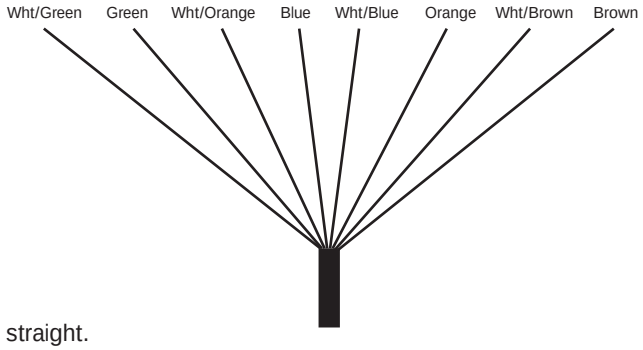
1. Strip 1/2 inch of insulation off all remote room speaker wires. Be careful not to cut conductor strands.
2. Neatly twist the conductor strands so that they won't fray.
3. To help ensure proper sound, connect speaker wires observing consistent polarity and Left/Right separation.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
4. Connect the Room 1, Room 2, Room 3, Room 4, Room 5 and Room 6 speaker wires to the corresponding speaker terminals on the back panel. (Note that the NHS-301 system supports two remote rooms. The NHS-502 system supports four remote rooms. The NHS-703 system supports six remote rooms.)

Remote Room Video (NHS-703 and 502 Only)

Insert the Room 1, Room 2 and Room 3 Video cable plugs into Video 1, Video 2 and Video 3 outputs on the back panel.

Remote Room Control Signals (NHS-703 and 502 Only)

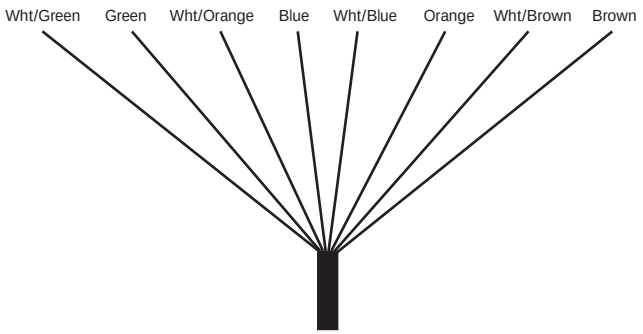
1. Terminate the Remote room control cables with “category-rated” RJ-45 plugs.
   - A. Use a cable stripping tool to strip off about two inches of the jacket insulation.
   - B. Untwist each conductor and spread the conductors out. Use the so-called “T568A” or “A” standard wiring configuration. To do this, arrange the conductors in the following order from left to right, as seen from the cable side:
     - I. Pin 1: White/Green
     - II. Pin 2: Green
     - III. Pin 3: White/Orange
     - IV. Pin 4: Blue
     - V. Pin 5: White/Blue
     - VI. Pin 6: Orange
     - VII. Pin 7: White/Brown
     - VIII. Pin 8: Brown



   - C. Pull each conductor taut, flat and straight.
   - D. Bring the conductors together and insert them into an empty RJ-45 plug until the jacket is firmly seated under the insulation clamp. The conductors should extend out the front of the plug.
   - E. Insert the plug into an RJ-45 crimping tool until it snaps in place.
   - F. Crimp the plug through the entire ratchet cycle of the crimping tool.
2. Connect the RJ-45 plugs for the Room 1, Room 2, Room 3, Room 4, Room 5 and Room 6 control cables to the corresponding remote room RJ-45 jacks on the back panel. (Note that the NHS-502 system supports four remote rooms. The NHS-703 system supports six remote rooms.)

Remote Room DC Power (NHS-301 Only)

1. Terminate the Remote DC power cables with “category-rated” RJ-45 plugs.
   - A. Use a cable stripping tool to strip off about two inches of the jacket insulation.
   - B. Untwist each conductor and spread the conductors out. Use the so-called “T568A” or “A” standard wiring configuration. To do this, arrange the conductors in the following order from left to right, as seen from the cable side:
     - I. Pin 1: White/Green
     - II. Pin 2: Green
     - III. Pin 3: White/Orange
     - IV. Pin 4: Blue
     - V. Pin 5: White/Blue
     - VI. Pin 6: Orange
     - VII. Pin 7: White/Brown
     - VIII. Pin 8: Brown.



C. Pull each conductor taut, flat and straight.

D. Bring the conductors together and insert them into an empty RJ-45 plug until the jacket is firmly seated under the insulation clamp. The conductors should extend out the front of the plug.

E. Insert the plug into an RJ-45 crimping tool until it snaps in place.

F. Crimp the plug through the entire ratchet cycle of the crimping tool.

2. Connect the Room 1 and Room 2 power cables to the “DC output” terminals on the back panel.

Cable TV, Terrestrial TV Antenna Feed

Connect the main cable TV feed (or rooftop antenna feed for terrestrial broadcasting) to the “RF [From CATV]” input on the back panel.

Satellite TV Feed

Connect the feed from the dish antenna directly to the “SAT” input on the back panel

AC Power

Plug the power strip AC cord into the grounded duplex AC output that is dedicated for the System Rack.

Programming the remote for the Set-Top Box

Programming for Satellite or Cable Boxes will require a 4-digit Manufacture’s code to be stored under the CABLE or SAT button on the Remote.

To program:

1. Press either CABLE or SAT button on Remote and wait for the LED to stop flashing.
2. Press and hold the SETUP button and release after 3 blinks on LED.
3. Enter the 4-digit Manufacture’s code (see Appendix C).
4. You will see 2 short blinks on the LED if successful or 1 long blink if not successful.

NOTE: The remote will “timeout” if the 4-digit code is not entered within 10 seconds after the SETUP button is released. If this happens, you must restart the sequence from the beginning.

Program AM / FM station presets

Consult the A/V receiver operating instructions to program the AM/FM preset stations requested by the owner.

Home Theater Room: Speakers

Free-Standing Speakers

1. For all free-standing speakers (Left, Center, Right, Left Surround, Right Surround, Left Surround Rear and Right Surround), terminate the speaker wire in a wall plate.
2. If you need to shorten the service loop, remember to re-label each cable end.
3. Strip 1/2 inch of insulation from the speaker wire.
4. Neatly twist the conductor strands so that they won't fray.
5. To help ensure proper sound, connect speaker wires observing consistent polarity. For every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.
6. Connect the speaker wires to the inside terminals of the wall plates.
7. Screw the wall plate into the junction box.
8. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.
9. Using short lengths of 14-gauge, 2-conductor cable, connect all free-standing speakers to their wall plates. Again, for every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.

In-Wall and In-Ceiling Speakers

1. If you need to shorten the service loop, remember to re-label each cable end.
2. Strip 1/2 inch of insulation from the speaker wire.
3. Neatly twist the conductor strands so that they won't fray.
4. To help ensure proper sound, connect speaker wires observing consistent polarity. For every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.
5. Install the speakers and grilles according to the instructions that came with the speakers.

Subwoofer

1. Terminate the Subwoofer cable in a wall plate that has an RCA jack inside and outside.
2. Plug the Subwoofer cable into the wall plate.
3. Screw the wall plate into the junction box.
4. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.
5. Use an RCA cable to connect the wall plate to the audio input of the subwoofer.
6. Connect the AC cord of the subwoofer to the AC duplex output provided.

Home Theater Room: Television

Installing Wall Plates

1. Connect all the television cables to wall plates. You will need one, two or three wall plates, depending on the wall plate system you choose and whether your connection includes an infrared repeater cable.

2. Connect the following six cables to wall plate connectors that have an RCA jack inside and outside:
    A. Composite Video
    B. Red (Pr)
    C. Green (Y)
    D. Blue (Pb)
    E. Audio Left
    F. Audio Right
3. Label the wall plate outputs. Remember that many of the connectors will look the same.
4. Connect the RF cable to a wall plate connector that has an F-connector female inside and outside.
5. Label the RF wall plate output.
6. If you have a remote repeater cable, connect the Cat 5 cable to a wall plate connector that has a 1/8-inch minijack inside and outside.
7. Label the remote repeater wall plate output.
8. Screw the wall plate(s) into the junction box.
9. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.

Connecting the Television

1. Use RCA cables to connect the Red (Pr), Green (Y) and Blue (Pb) wall plate connectors to the “Video 5” or “Video 6” component video inputs of the television, whichever is higher.
2. Use an RCA cable to connect the Composite Video wall plate connector to the “Video 1” composite video input of the television.
3. Connect the RF wall plate connector to the “RF input” of the television.
4. If you are installing a remote repeater, attach an infrared remote sensor “eye” to an inconspicuous place visible on the front of the television.
5. Connect the 1/8-inch miniplug on the cable from the infrared remote sensor “eye” to the 1/8 minijack in the wall plate. This will feed main room remote signals to a System Rack that is hidden.

Remote Room: In-Wall Remote Controls and Volume Controls (NHS-703 and NHS-502)

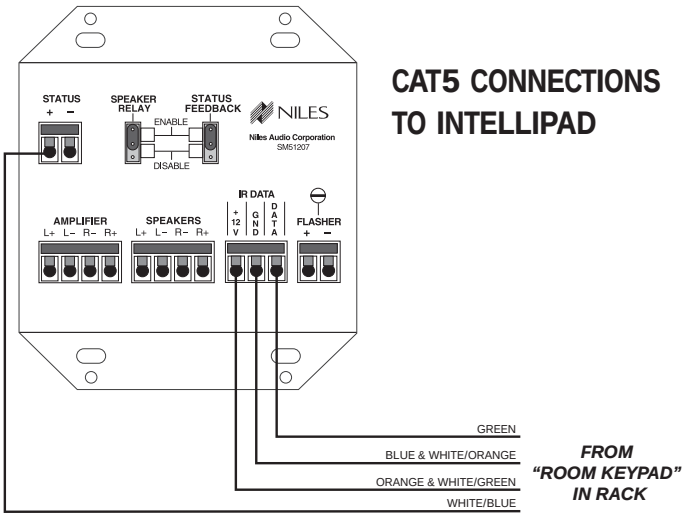
Amplifier Connection

1. Strip 1/4 inch of insulation off each conductor in the 4-conductor speaker cable that comes from the System Rack.
2. Neatly twist the conductor strands so that they won’t fray.
3. Detach the “Amplifier” connector from the in-wall remote control.
4. Loosen the screws on the Amplifier connector.
5. Insert the four speaker conductors, observing consistent polarity and Left/Right separation and tighten the screws on each conductor.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
6. Failure to wire consistently can result in no sound, switched Left and Right signals or poor bass sound.
7. Snap the Amplifier connector back into the in-wall remote control.

Remote Room: In-Wall Remote Controls and Volume Controls (NHS-703 and NHS-502)

Amplifier Connection

1. Strip 1/4 inch of insulation off each conductor in the 4-conductor speaker cable that comes from the System Rack.
2. Neatly twist the conductor strands so that they won't fray.
3. Detach the "Amplifier" connector from the in-wall remote control.
4. Loosen the screws on the Amplifier connector.
5. Insert the four speaker conductors, observing consistent polarity and Left/Right separation and tighten the screws on each conductor.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
6. Failure to wire consistently can result in no sound, switched Left and Right signals or poor bass sound.
7. Snap the Amplifier connector back into the in-wall remote control.



CAT5 CONNECTIONS TO INTELLIPAD

IR Data Connection

1. Detach the "IR Data" connector from the in-wall remote control.
2. Loosen the screws on the IR Data connector.
3. Connect the Cat 5 cable to the IR data connector. Start by using a cable stripping tool to strip off about two inches of the jacket insulation.
4. Strip 1/4 inch of insulation off six of the eight conductors (the Brown and White/Brown will not be used).
5. Twist the Orange and White/Green conductors together and connect them to the "+12V" terminal of the IR data input. Tighten with a small, straight screwdriver.
6. Twist the Blue and White/Orange conductors together and connect them to the "GND" terminal of the IR data input. Tighten with a small, straight screwdriver.
7. Connect the Green conductor to the "DATA" terminal of the IR data input. Tighten with a small, straight screwdriver.
8. Connect the White/Blue conductor to the "STATUS" terminal of the STATUS input. Tighten with a small, straight screwdriver.
9. Snap the IR Data connector back into the in-wall remote control.

Keypad-to-Volume Control Connection

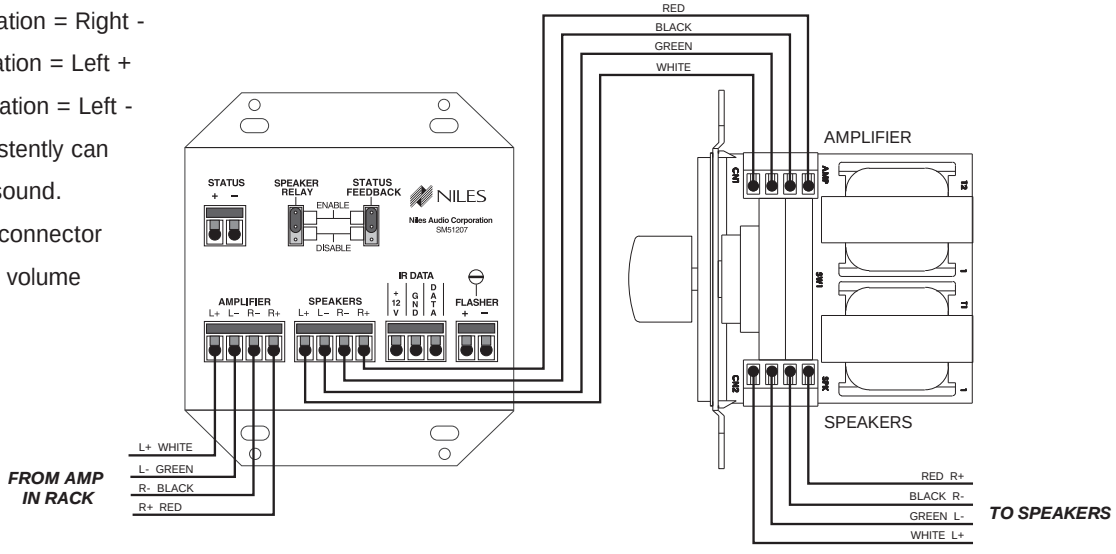
1. For your convenience, Sony supplies jumper cables for the short run from the "Speakers" output of the keypad to the "Amplifier" input of the volume control.
2. To connect the jumper cables to the "Speakers" output connector of the keypad, start by removing the connector from the keypad and loosening the connector screws.

3. Insert the four speaker conductors, observing consistent polarity and Left/Right separation and tighten the screws on each conductor.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
4. To connect the jumper cables to the “Amplifier” input connector of the volume control, start by removing the connector from the volume control and loosening the connector screws.
5. Insert the four speaker conductors, again observing consistent polarity and Left/Right separation, and tighten the screws on each conductor.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
6. Failure to wire consistently can result in no sound, switched Left and Right signals or poor bass sound.
7. Plug the “Speakers” output connector into the keypad.
8. Being careful not to loosen any connections. Plug the “Amplifier” input connector into the volume control.

Speakers Connection

1. Strip 1/4 inch of insulation off each conductor on both of the 2-conductor cables that run to the speakers in your remote room.
2. Neatly twist the conductor strands so that they won’t fray.
3. Detach the “Speakers” connector from the in-wall volume control.
4. Loosen the screws on the Speakers connector.
5. Insert the four speaker conductors, observing consistent polarity and Left/Right separation and tighten the screws on each conductor.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
6. Failure to wire consistently can result in poor bass sound.
7. Snap the Speakers connector back into the in-wall volume control.

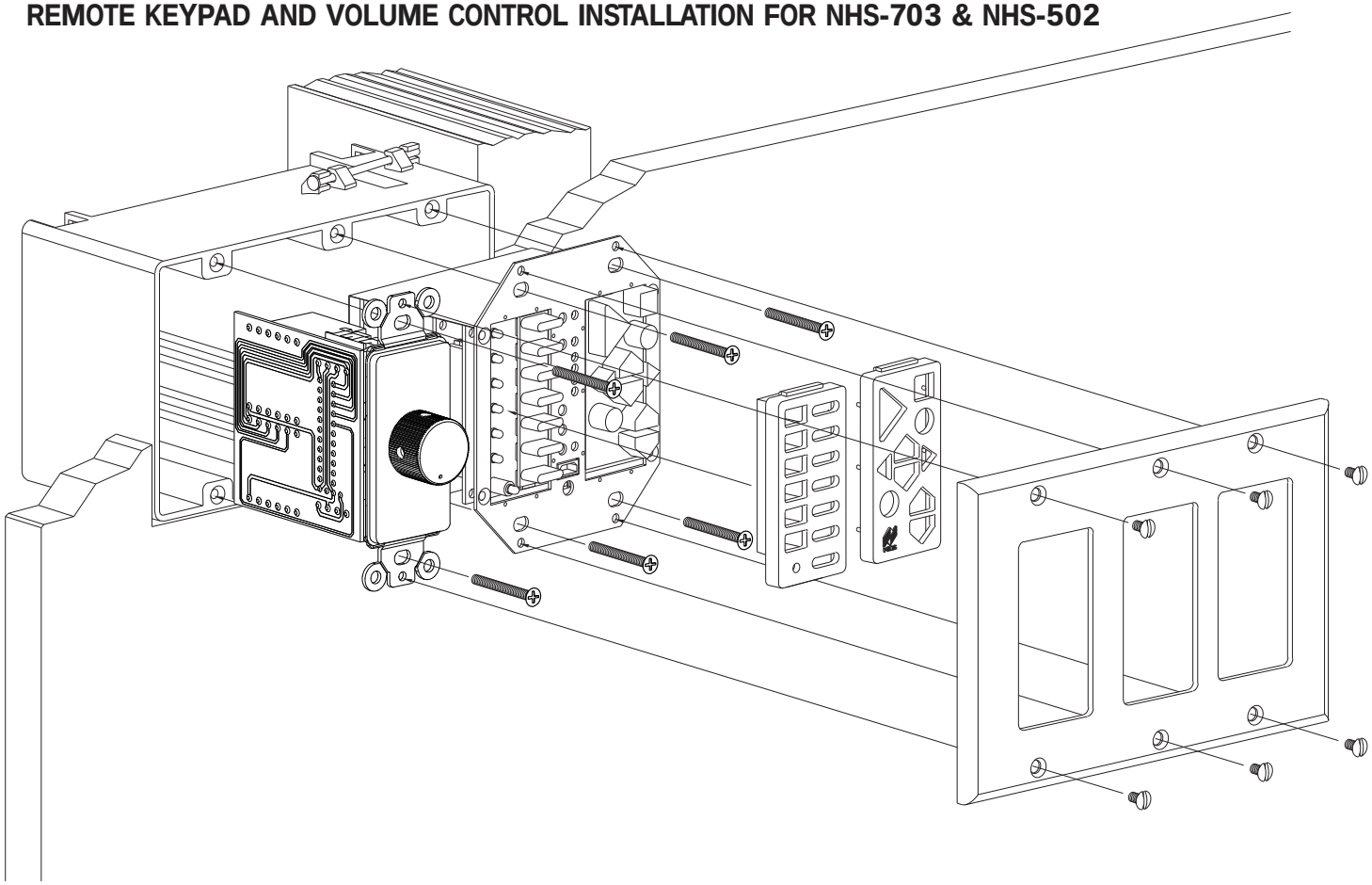
SPEAKER CONNECTIONS TO INTELLIPAD & VOLUME CONTROL



Installing the Controls

1. Carefully seat both the in-wall volume control and remote control into the three-gang junction box.
2. If necessary, work the loose cables back into the wall cavity.
3. Screw the controls into the junction box.
4. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.

REMOTE KEYPAD AND VOLUME CONTROL INSTALLATION FOR NHS-703 & NHS-502



Remote Room: In-Wall Remote Muting Volume Controls (NHS-301)

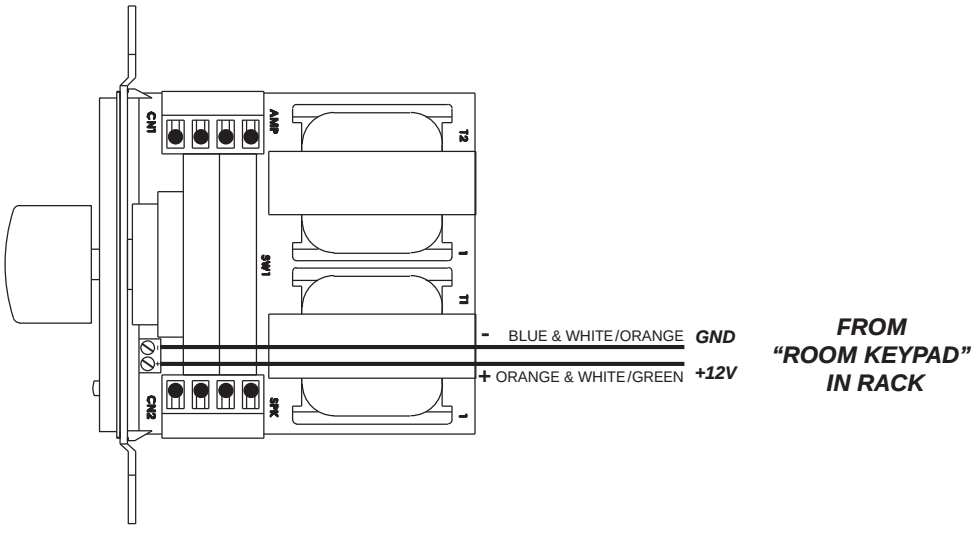
Amplifier Connection

1. Strip 1/4 inch of insulation off each conductor in the 4-conductor speaker cable that comes from the System Rack.
2. Neatly twist the conductor strands so that they won't fray.
3. Detach the "Amplifier" connector from the in-wall muting volume control.
4. With a screwdriver or thumbnail, raise the locking tabs.
5. Insert the four speaker conductors, observing consistent polarity and Left/Right separation and snap the locking tabs shut onto each conductor.
    A. RED insulation = Right +
    B. BLACK insulation = Right -
    C. WHITE insulation = Left +
    D. GREEN insulation = Left -
6. Failure to wire consistently can result in no sound, switched Left and Right signals or poor bass sound.
7. Snap the Amplifier connector back into the in-wall muting volume control.

Power Connection

1. Locate the two-pin voltage connector.
2. Loosen the screws on the voltage connector.
3. Connect the Cat 5 cable to the voltage connector. Start by using a cable stripping tool to strip off about two inches of the jacket insulation.
4. Strip 1/4 inch of insulation off four of the eight conductors (White/Green, White/Orange, Blue and Orange). The other four conductors will not be used.
5. Twist the Orange and White/Green conductors together and connect them to the "+12V" terminal of the voltage connector. Tighten with a small, straight screwdriver.
6. Twist the Blue and White/Orange conductors together and connect them to the "GND" terminal of the voltage connector. Tighten with a small, straight screwdriver.

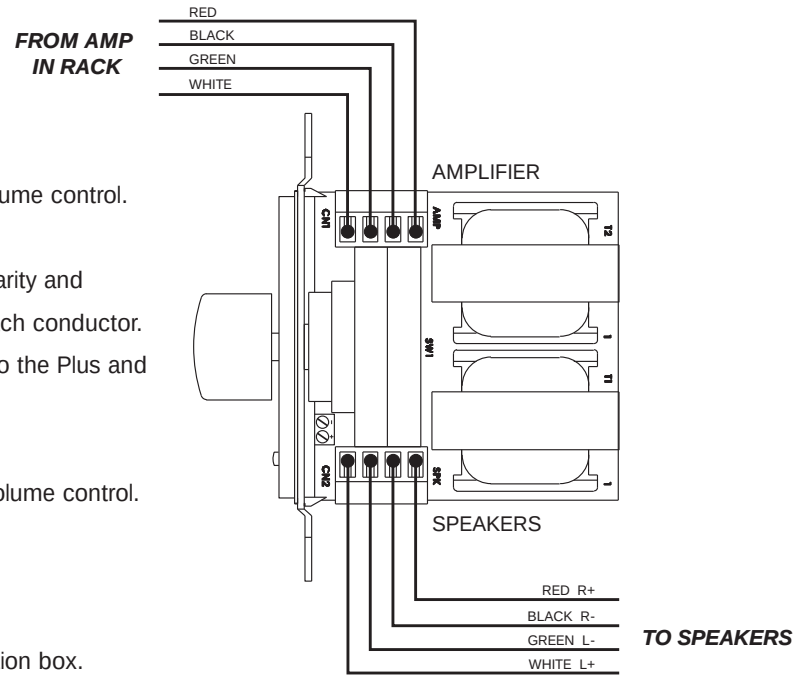
CAT5 CONNECTIONS TO MUTING VOLUME CONTROL



Speakers Connection

1. Strip 1/4 inch of insulation off each conductor on both of the 2-conductor cables that run to the speakers in your remote room.
2. Neatly twist the conductor strands so that they won't fray.
3. Detach the "Speakers" connector from the in-wall muting volume control.
4. With a screwdriver or thumbnail, raise the locking tabs.
5. Insert the four speaker conductors, observing consistent polarity and Left/Right separation and snap the locking tabs shut onto each conductor.
6. IMPORTANT: Connect EXACTLY THE SAME insulator color to the Plus and Minus terminals as you did on the speakers.
7. Failure to wire consistently can result in poor bass sound.
8. Snap the Speakers connector back into the in-wall muting volume control.

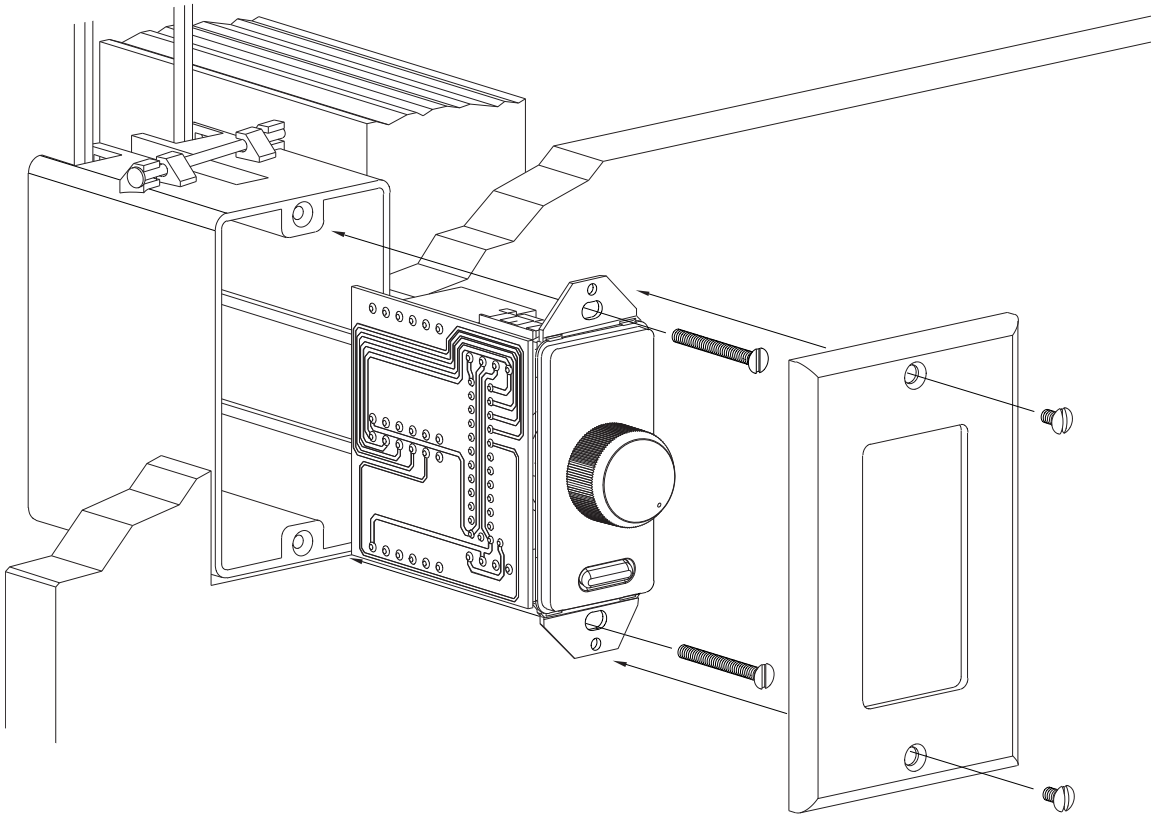
SPEAKER CONNECTIONS TO MUTING VOLUME CONTROL



Installing the Control

1. Carefully seat the in-wall muting volume control into the junction box.
2. If necessary, work the loose cables back into the wall cavity.
3. Screw the controls into the junction box.
4. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.

MUTING VOLUME CONTROL INSTALLATION FOR NHS-301



Remote Room: Speakers

Free-Standing Speakers

1. For all free-standing speakers, connect the speaker wire to a wall plate.
2. If you need to shorten the service loop, remember to re-label each cable end.
3. Strip 1/2 inch of insulation from the speaker wire.
4. Neatly twist the conductor strands so that they won't fray.
5. To help ensure proper sound, connect speaker wires observing consistent polarity. For every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.
6. Connect the speaker wires to the inside terminals of the wall plates.
7. Screw the wall plate into the junction box.
8. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.
9. Using short lengths of 14-gauge, 2-conductor cable, connect all free-standing speakers to their wall plates. Again, for every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.

In-Wall and In-Ceiling Speakers

1. If you need to shorten the service loop, remember to re-label each cable end.
2. Strip 1/2 inch of insulation from the speaker wire.
3. Neatly twist the conductor strands so that they won't fray.
4. To help ensure proper sound, connect speaker wires observing consistent polarity. For every speaker, connect THE SAME insulator color to the Red (+) terminal and the opposite insulator color to the Black (-) terminal.
5. Install the speakers and grilles according to the instructions that came with the speakers.

Remote Room: Television

1. Connect the Composite Video cable to a wall plate connector that has an RCA jack inside and outside.
2. Label the wall plate video output.
3. If you are performing cable and satellite distribution, connect the RF cable to a wall plate connector that has an F-connector female inside and outside.
4. Label the RF wall plate output.
5. Screw the wall plate into the junction box.
6. Affix the face plate, if necessary loosening the wall plate screws for a snug fit to the wall.
7. Use an RCA cable to connect the Composite Video wall plate connector to the "Video 1" composite video input of the television.
8. Use an F-connector coaxial cable to connect the RF wall plate connector to the "RF input" of the television.

System Test

1. Confirm that the receiver volume control is all the way down. Turn it down manually, if necessary.
2. Locate the stereo power amplifiers at the bottom of the rack. Confirm that all stereo power amplifier power switches are set to "On" (depressed).
3. Confirm that the subwoofer power switch is set to "On."
4. Turn on the DVD changer and load a DVD into it.
5. Power up the main system by pressing the DVD button on the supplied wireless system remote control.
6. Slowly turn the receiver volume up.
7. Press Play on the remote control to commence DVD playback.
8. You should get picture and sound in the main room.
9. Repeat the test for VHS tapes and CDs, as well as AM/FM stations.
10. Confirm that each remote room is receiving the appropriate signals from the main room.
11. Confirm that the remote room volume controls are working properly and that all speakers are playing.
12. If you are distributing RF to televisions that will be installed later, be sure to provide each "open" F-connector with a 75-ohm terminator plug.
13. If you have handled cable or satellite TV distribution and if the service is running, confirm that the distribution is working to all connected televisions. *NOTE:* The remote room keypads will not control the channel on a single, centralized cable, satellite or HD set-top box channels. The only control is Volume.
14. After testing, carefully set the System Rack into the wall, sliding the rack onto the plywood box.

Finishing Touches

1. *Walk-through.* Train the home owner on how to use the system. Walk the owner through the Sony Operating Instructions that we provide for these New Home Entertainment Solutions.
2. *Manuals and handheld remote.* Assemble all user manuals and the handheld wireless remote in an envelope. Leave the envelope with the homebuyer
3. *Sign your work.* Place a small sticker on the bottom front of the system rack with your company name, telephone number and website URL. Let them know how to get in touch with you. You may also choose to leave a welcome letter, business card or capabilities brochure in the envelope with the wireless remote. This will serve not only for tech help, but also for future upgrade opportunities.
4. *Documentation.* Leave a copy of the wiring plan (which includes the layout of each zone) and wire list in a plastic Zip-Loc™ style bag behind the System Rack. Retain copies of the same documents on file in your office. This documentation will save countless hours of tracing connections during future upgrades and service calls. Your repair technician will appreciate the foresight. And the homebuyer will love your service and support.

Troubleshooting

If, after reading this manual, you have additional questions related to the installation of this System, please call our Installer Support Hotline:

1-866-924-7669 or email: sonynewhome@info.sel.sony.com

Appendix A: Component Replacement

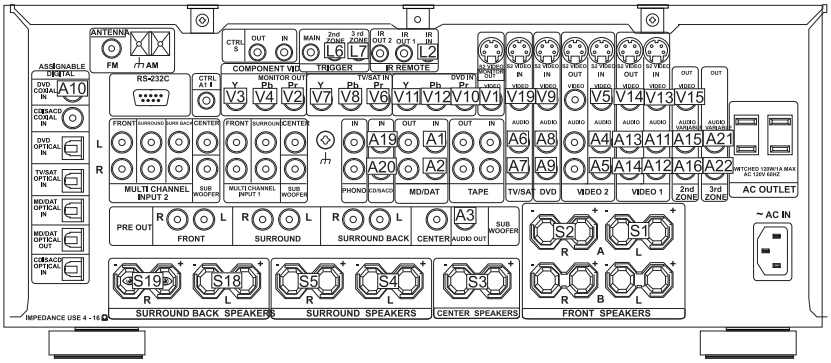
All systems come with a one-year warranty for parts and labor and a 48-hour hot swap program. As the installer and dealer, it's in your own best interests to service the customer's needs after the installation.

If a component in the system rack fails, you can remove it as follows.

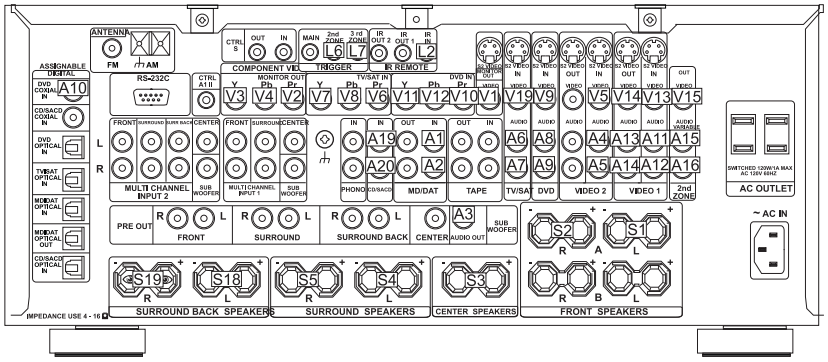
1. To access the back, carefully remove the rack from the soffit or cabinet.
2. Stage the System Rack close to the wall opening, on a stable platform off the floor.
3. Loosen the mounting clips at the bottom rear of the component.
4. Loosen mounting bar at the top rear of the component.
5. Unplug the signal cables and power cables.
6. Carefully slide the component out of the rack.

To install a repaired or replacement component, take the following steps:

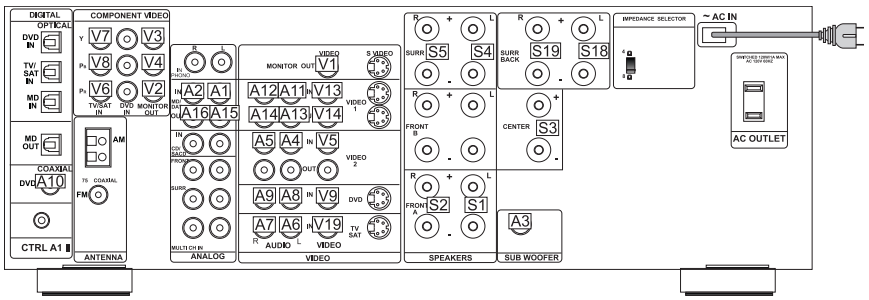
1. To access the back, carefully remove the rack from the soffit or cabinet.
2. Stage the System Rack close to the wall opening, on a stable platform off the floor.
3. Carefully slide the new component in.
4. Replace the mounting bar and clips so that the component faceplate fits flush with the face of the rack.
5. Tighten the mounting bar and clips so the component doesn't move.
6. Reconnect all signal cables and the component's AC power cord.
7. For your convenience, every one of the rack's internal connecting cables is labeled on both ends.
8. If you are installing an A/V receiver, please refer to the cable labels and observe the following wiring diagrams.



Follow this diagram when connecting a replacement A/V receiver in the NHS-703 system.



Follow this diagram when connecting a replacement A/V receiver in the NHS-502 system.



Follow this diagram when connecting a replacement A/V receiver in the NHS-301 system.

APPENDIX B:

SETUP CODES FOR CABLE

ABC 0003, 0017
Americast 0899
Bell South 0899
General Instrument 0276, 0476, 0810
GoldStar 0144
Hamlin.....0009, 0273
Jerrold.....0003, 0276, 0476, 0810
Memorex.....0000
Motorola 1106
Pace 0237
Panasonic 0107, 0000
Paragon 0000
Philips 0305, 0317
Pioneer 0144, 0533, 0877
Pulsar 0000
Quasar 0000
Regal 0273, 0279
Runco 0000
Samsung.....0144
Scientific Atlanta 0017, 0477, 0877
Starcom 0003
Toshiba 0000
Zenith 0000, 0525, 0899

SETUP CODES FOR SATELLITE

AlphaStar 0772
Chaparral 0216
Echostar 0775, 1005
Expressvu 0775
GE 0566
General Instrument 0869
HTS 0775
Hitachi.....0819
Hughes Network Systems.....0749, 1142, 1749
JVC.....0775
Magnavox 0722, 0724
Memorex.....0724
Mitsubishi 0749
Next Level.....0869
Panasonic 0247, 0701
Philips 1076, 1142, 0722, 0724, 0749
Proscan.....0392
RCA 0566, 0392, 0143, 0855
Radio Shack 0869
Samsung.....1109
Sony 0639
Star Choice.....0869
Toshiba 0749, 0790
Uniden 0724, 0722
Zenith 0856

SONY

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