# Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for HARMAN KARDON AVR 254. You'll find the answers to all your questions on the HARMAN KARDON AVR 254 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

**User manual HARMAN KARDON AVR 254**
**User guide HARMAN KARDON AVR 254**
**Operating instructions HARMAN KARDON AVR 254**
**Instructions for use HARMAN KARDON AVR 254**
**Instruction manual HARMAN KARDON AVR 254**



harman/kardon
Designed to Entertain.

**AVR 254**
AUDIO/VIDEO RECEIVER
OWNER'S MANUAL

*Manual abstract:*

*Heed all warnings. Follow all instructions. Do not use this apparatus near water. @@Do not use water or any liquid cleaners. 7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions. 8. @@9. @@A polarized plug has two blades with one wider than the other. A groundingtype plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. 10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.*

*11. Only use the attachments/accessories specified by the manufacturer. 12. Use only with a cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 13. @@14. Refer all servicing to qualified service personnel. @@1. 2. 3. 4. 5. @@@@Connection to a line voltage other than that for which it is intended can create a safety and fire hazard and may damage the unit. If you have any questions about the voltage requirements for your specific model, or about the line voltage in your area, contact your selling dealer before plugging the unit into a wall outlet.*

*unit's feet may leave marks on certain wood or veneer materials. Use caution when placing the unit on soft woods or other materials that may be damaged by heat or heavy objects. Some surface finishes may be particularly sensitive to absorbing such marks, due to a variety of factors beyond our control, including the nature of the finish, cleaning materials used, and normal heat and vibration caused by the use of the product, or other factors. We recommend that caution be exercised in choosing an installation location for the component and in normal maintenance practices, as your warranty will not cover this type of damage to furniture. Cleaning When the unit gets dirty, wipe it with a clean, soft, dry cloth. If necessary, and only after unplugging the AC power cord, wipe it with a soft cloth dampened with mild soapy water, then a fresh cloth with clean water. Wipe it dry immediately with a dry cloth. NEVER use benzene, aerosol cleaners, thinner, alcohol or any other volatile cleaning agent. Do not use abrasive cleaners, as they may damage the finish of metal parts. Avoid spraying insecticide near the unit.*

*Do Not Use Extension Cords To avoid safety hazards, use only the power cord attached to your unit. We do not recommend that extension cords be used with this product. As with all electrical devices, do not run power cords under rugs or carpets or place heavy objects on them. Damaged power cords should be replaced immediately by an authorized service center with a cord meeting factory specifications. Handle the AC Power Cord Gently When disconnecting the power cord from an AC outlet, always pull the plug; never pull the cord.*

*If you do not intend to use the unit for any considerable length of time, disconnect the plug from the AC outlet. Moving the Unit Before moving the unit, be certain to disconnect any interconnection cords with other components, and make certain that you disconnect the unit from the AC outlet. Do Not Open the Cabinet There are no user-serviceable components inside this product. Opening the cabinet may present a shock hazard, and any modification to the product will void your guarantee. If water or any metal object such as a paper clip, wire or staple accidentally falls inside the unit, disconnect it from the AC power source immediately, and consult an authorized service center.*

*Important Information for the User This equipment has been tested and found to comply with the limits for a Class-B digital device, pursuant to Part 15 of the FCC Rules. The limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: · Reorient or relocate the receiving antenna. · Increase the separation between the equipment and receiver. · Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. · Consult the dealer or an experienced radio/TV technician for help. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.*

*NOTE: Changes or modifications may cause this unit to fail to comply with Part 15 of the FCC Rules and may void the user's authority to operate the equipment. CATV or Antenna Grounding If an outside antenna or cable system is connected to this product, be certain that it is grounded so as to provide some protection against voltage surges and static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements of the grounding electrode. NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call the CATV (cable TV) system installer's attention to article 820-40 of the NEC, which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as possible. Installation Location · To ensure proper operation and to avoid the potential for safety hazards, place the unit on a firm and level surface. When placing the unit on a shelf, be certain that the shelf and any mounting hardware can support the weight of the product. · Make certain that proper space is provided both above and below the unit for ventilation. If this product will be installed in a cabinet or other enclosed area, make certain that there is sufficient air movement within the cabinet. Under some circumstances, a fan may be required.*

*· Do not place the unit directly on a carpeted surface. · Avoid installation in extremely hot or cold locations, or in an area that is exposed to direct sunlight or heating equipment. · Avoid moist or humid locations.*

· Do not obstruct the ventilation slots on the top of the unit, or place objects directly over them. · Due to the weight of the AVR 254 and the heat generated by the amplifiers, there is the remote possibility that the rubber padding on the bottom of the Unpacking The carton and shipping materials used to protect your new receiver during shipment were specially designed to cushion it from shock and vibration.

We suggest that you save the carton and packing materials for use in shipping if you move, or should the unit ever need repair. To minimize the size of the carton in storage, you may wish to flatten it. This is done by carefully slitting the tape seams on the bottom and collapsing the carton. Other cardboard inserts may be stored in the same manner. Packing materials that cannot be collapsed should be saved along with the carton in a plastic bag.

If you do not wish to save the packaging materials, please note that the carton and other sections of the shipping protection are recyclable. Please respect the environment and discard those materials at a local recycling center. It is important that you remove the protective plastic film from the front-panel lens. Leaving the film in place will affect the performance of your remote control. 3 STAPLE INVOICE HERE 4 TABLE OF CONTENTS 2 6 8 11 14 17 18 18 18 18 19 19 19 20 20 20 20 21 22 24 24 24 24 24 28 29 29 29 30 31 31 33 33 33 35 38 38 38 38 38 38 38 38 39 39 40 40 41 41 SAFETY INFORMATION INTRODUCTION FRONT-PANEL CONTROLS REAR-PANEL CONNECTIONS REMOTE CONTROL FUNCTIONS INTRODUCTION TO HOME THEATER CONNECTIONS Speaker Connections Subwoofer Connecting Source Devices to the AVR Audio Connections Digital Audio Analog Audio Video Connections Digital Video Analog Video Antennas RS-232 Serial Port SPEAKER PLACEMENT INSTALLATION Step One  Connect the Speakers Step Two  Connect the Subwoofer Step Three  Connect the Antennas Step Four  Connect the Source Components Step Five  Connect the Video Display Step Six  Plug in AC Power Step Seven  Insert Batteries in Remote Step Eight  Program Sources Into the Remote Step Nine  Remote IR Inputs and Output (optional) Step Ten  Install a Multizone System (optional) Step Eleven  Turn On the AVR 254 INITIAL SETUP Using the On-Screen Menu System Configure the AVR 254 Using EzSet/EQ Technology Set Up Sources OPERATION Turning On the AVR 254 Volume Control Mute Function Sleep Timer Audio Effects Video Modes Headphones Source Selection Using the Tuner XM Radio Operation Recording Stereo Jack Input Selecting a Surround Mode 42 ADVANCED FUNCTIONS 42 Audio Processing and Surround Sound 42 Analog Audio Signals 42 Digital Audio Signals 43 Surround Modes 44 Dolby Surround Settings 44 Night Mode 45 Manual Setup 45 Step One  Determine Speaker Crossover 45 Step Two  Measure Speaker Distances 45 Step Three  Manual Setup Menu 46 Number of Speakers 46 Adjust Crossover Frequencies Menu 46 Sub Mode 47 Adjust Speaker Distance Menu 47 Step Four  Setting Channel Output Levels Manually 48 Audio Effects 49 Video Adjustments 49 Video Modes 50 How to Adjust the Custom Picture Settings 51 Multizone Operation 51 Installing a Multizone System 51 Operating the Multizone System 52 System Settings 53 Advanced Remote Control Functions 53 Punch-Through Programming 53 Activities (Macros) 53 Resetting the Remote 53 Processor Reset 54 Memory 55 TROUBLESHOOTING GUIDE 56 APPENDIX 63, 75 Trademark Acknowledgments 75 TECHNICAL SPECIFICATIONS WARNING To prevent fire or shock hazard, do not expose this appliance to rain or moisture. For Canadian model This Class B digital apparatus complies with Canadian ICES-003. For models having a power cord with a polarized plug: CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert. Modèle pour les Canadien Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada. Sur les modèles dont la fiche est polarisee: ATTENTION: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond. 5 INTRODUCTION Please register your AVR 254 on our Web site at www.

harmankardon.com. Note: You&#0 remote control · EzSet/EQ microphone · AM loop antenna · FM wire antenna · Four AAA batteries · Two covers for front-panel jacks *XM antenna module and subscription to XM service required. Hardware and service sold separately. XM service is not available in Alaska or Hawaii. Digital Audio Inputs · Coaxial: two rear-panel/one front-panel · Optical: two rear-panel/one front-panel is jack, place the microphone at the listening position, and follow the directions given in the Speaker Setup-Automatic Setup-EzSet/EQ on-screen menu. AVR Settings Button: Press this button to access the AVR's main menu. Surround Modes: Press this button to select a surround sound (e.g., multichannel) mode.

The Surround Modes menu will appear on screen, and the menu line will appear in the front-panel display. Use the front-panel or remote //¤ Buttons to highlight a different menu line: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Each line represents a type of audio signal, and is set to the preferred surround mode that you manually select. Press the OK Button when the menu line is highlighted, and the available surround mode options for the current signal will appear. Use the //¤ Buttons to select the desired mode, and press the OK Button to engage it.

Press the Back/Exit Button to exit the Surround Modes menu. Info Settings Button: Press this button to directly access the AVR's Source Info submenu, which contains the settings for the current source. Resolution: Each press of this button changes the AVR's video output resolution to these settings: 480i, 480p, 720p, 1080i or 1080p. IMPORTANT NOTE: If the AVR's video output resolution is set higher than the capabilities of the actual connection, you will not see a picture. If the best video connection from the AVR to the TV is either composite or S-video, press this button until the resolution is set to 480i.

8 AVR Message Display Speaker/Channel Input Indicators Volume Info Remote IR Sensor Power Indicator Video Modes Surround Modes OK Source List Audio Effects Resolution / Navigation Headphone Jack/EzSet/EQ Microphone Input Standby/On Switch Main Power Switch / Navigation Back/ Exit Digital Audio Inputs (Optical 3 and Coaxial 3) Video 4 Analog Audio Inputs Video 4 Video Inputs NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com. 9 FRONT-PANEL CONNECTIONS Audio Effects: Press this button to directly access the Audio Effects submenu, which allows adjustment of the tone and other controls.

See the Initial Setup section for more information. Video Modes: Press this button for direct access to the Video Modes submenu, which contains settings that may be used to improve the picture if necessary after you have adjusted the picture settings using the video display or TV. OK: Press this button to select the currently highlighted item. Back/Exit: Press this button to return to the previous menu, or to exit the menu system. 10 REAR-PANEL CONNECTIONS AM and FM Antenna Terminals: Connect the included AM and FM antennas to their respective terminals for radio reception. XM Antenna Jack: Plug in an XM Connect and Play or Mini Tuner antenna module here.

The XM antenna module is purchased separately, and should specify that it is for home use with an XM Ready® product. You will need to subscribe to the XM service, which is available separately, and activate the service for your antenna module. (XM service is not available in Alaska and Hawaii.) of video connection for each source. These inputs are assignable, which means they may be paired with any analog or digital audio inputs. This will be explained in more detail in subsequent sections of this manual. NOTE: The Video 2 inputs are associated with a set of outputs. Consider connecting a video recorder here. Composite and S-Video 2 Outputs: Connect one of these analog video outputs to the composite or S-video inputs of a recording device. A signal is available at these outputs whenever an analog video source is playing.

HDMI and component video signals are not available for recording. Front, Center and Surround Speaker Outputs: Use twoconductor speaker wire to connect each set of terminals to the correct speaker. Remember to observe the correct polarity (positive and negative connections). Always connect the positive lead to the colored terminal on the receiver and the red terminal on the speaker. Connect the negative lead to the black terminal on both the receiver and the speaker. See the Connections section for more information on connecting your speakers. Surround Back/Zone 2 Speaker Outputs: These speaker outputs are used for the surround back channels in a 7.1-channel home theater, or may be reassigned to a remote room for multizone operation. When these outputs are reassigned for multizone operation, only a 5.1-channel configuration will be available in the main listening room.

Use the on-screen menu system to configure these channels as desired. As with the other speaker outputs, remember to observe proper polarity by connecting the positive and negative output terminals to the corresponding terminals on each speaker. Composite and S-Video Monitor Outputs: If any of your sources use composite or S-video connections, connect one or both of these monitor outputs to the corresponding inputs on your television or video display. If your video display is equipped with HDMI or component video inputs, these connections are unnecessary. Connect the HDMI Monitor Output (if available, otherwise use the Component Video Monitor Output) to your TV, and the AVR 254 will convert the composite or S-video source signal to the correct format for a single video cable connection to the TV. HDMI Inputs and Output: HDMI (High-Definition Multimedia Interface) is a connection for transmitting digital audio and video signals between devices. With the AVR 254's powerful processor, you may connect up to three HDMI-equipped source devices to the HDMI inputs using a single-cable connection, while benefiting from superior digital audio and video performance. If your video display is not HDMI-compatible, connect the device to one of the analog video inputs, then pair it with an analog or digital audio input. If your video display has an HDMI input, make just the HDMI video connection to your display; the AVR 254 will automatically transcode analog video signals to the HDMI format, upscaling to as high as 1080p. Subwoofer Output: If you have a powered subwoofer with a line-level input, connect it to this jack.

Preamp Outputs: Connect these jacks to an external amplifier if more power is desired. The Surround Back/Zone 2 Preamp Outputs may be used with an external amplifier to power the surround back channels, or to power the remote zone of a multizone system. Use the on-screen menu system to configure these channels as desired. Remote Infrared (IR) Input and Output: When the remote IR receiver on the front panel is blocked, such as when the AVR is placed inside a cabinet, connect an optional IR receiver to the Remote IR Input jack for use with the remote control. The Remote IR Output may be connected to the Remote IR Input of a compatible product to enable remote control through the AVR. This is particularly useful in multizone applications to control a source device from the remote room (when used with the Zone 2 IR Input). When several source devices are used, connect them in "daisy chain" fashion. Zone 2 Infrared (IR) Input: Connect a remote IR receiver located in the remote zone of a multizone system to this jack to control the AVR (and any source devices connected to the Remote IR Output) from the remote zone. Analog 1 5: Connect the left and right analog audio outputs of a source device to any of these inputs. These inputs are assignable, which means they may be paired with any video inputs, as explained in subsequent sections of this manual.

NOTES: · The Analog 3 through 5 connectors physically line up below the Video 1 through 3 (composite and S-video) connectors. For convenience, consider using Analog 3 with Video 1, Analog 4 with Video 2 and Analog 5 with Video 3, if appropriate for your system. · The Analog 1 and 2 connectors don't physically line up with any analog video inputs. Consider using them for audio-only devices, such as a CD player or cassette tape deck. · The Analog 2 and 4 inputs are each associated with a set of outputs.

Consider using the Analog 2 connectors for an audio recorder, and the Analog 4 connectors for a video recorder (along with the Video 2 connectors). · You may optionally connect a source to both an analog and digital audio input. This is useful for making recordings, for multizone applications or simply as a backup. 11 Composite and S-Video 1, 2 and 3 Video Inputs: These jacks may be used to connect your video-capable source components (e.g. , VCR, DVD player, cable TV box) to the receiver. Use only one type REAR-PANEL CONNECTIONS Analog 2 and 4 Outputs: Connect either of these analog audio outputs to the analog audio inputs of a recording device. A signal is available at these outputs whenever an analog audio source is playing. However, the AVR 254 does not convert digital audio sources to analog for recording. RS-232 Mode: Leave this switch popped out in the Operate position unless the AVR 254 is being upgraded. RS-232 Reset: This switch is only used during a software upgrade. A standard processor reset is performed by pressing and holding the front-panel OK Button.

*Coaxial 1/2 and Optical 1/2 Digital Audio Inputs: If a source has a compatible digital audio output, and if you are not using an HDMI connection for audio for the device, connect it to one of these jacks to hear digital audio formats, such as Dolby Digital, DTS and linear PCM. Use only one type of digital audio connection for each source. Switched AC Accessory Outlet: You may plug the AC power cord of one source device into this outlet, and it will turn on whenever you turn on the receiver.*

*Do not use a source that consumes more than 50 watts of power. AC Power Cord: After you have made all other connections, plug the AC power cord into an unswitched outlet. Coaxial Digital Audio Output: If a source is also an audio recorder, connect a coaxial digital audio output to the recorder's input for improved recording quality. Only PCM digital audio signals are available for recording. Stereo Jack: Enjoy audio from an iPod (not included), CD player or other portable player by connecting its headphone jack to this input using a 1/8" stereo mini-plug cable (not included). Video and still-image playback are not available at this input. 6-/8-Channel Inputs: Connect the multichannel analog audio , outputs of a DVD-Audio, SACDTM Blu-ray DiscTM or HD-DVDTM player (or any other external decoder) to these jacks to enjoy these formats. NOTE: When the multichannel player has an onboard digital decoder, it is not necessary to connect it to the 6-/8-Channel Analog Audio Inputs. Only a digital audio connection (HDMI, coaxial or optical) is needed. Component Video 1 and 2 Inputs: If a video source (e.*

*g., DVD player or HDTV tuner) has analog component video (Y/Pb/Pr) capability, and if you are not using an HDMI connection for the device, then connect the component video outputs of the source to one of the two component video inputs. Do not make any other video connections to that source. Component Video Monitor Outputs: If you are using one of the Component Video Inputs and your television or video display is component-video-capable, and if you are not connecting the HDMI Output to your display, connect these jacks to the corresponding inputs on your video display. NOTES: · Due to copy-protection restrictions, there is no output at the Component Video Monitor Outputs for copy-protected sources.*

*· Composite and S-video signals are upscaled to as high as 1080i and available at these outputs. If your video display's best connection is component video, it is the only video connection required from the AVR to the display. RS-232 Serial Port: This specialized connector may be used with your personal computer in case we offer a software upgrade for the receiver at some time in the future. 12 12 12 13 FM Antenna Stereo Jack S-Video 1, 2 and 3 Composite 1, 2 and 3 HDMI 1, 2 and 3 AC Power Cord Component 1 and 2 AM Antenna Composite 2 Output S-Video 2 Output XM Antenna Component Video Monitor Outputs Video Monitor Outputs HDMI Monitor Output Analog 2 Outputs 6-/8Channel Inputs Remote IR Input Preamp Outputs Analog 4 Outputs Front Speaker Outputs Coaxial Digital Audio Output Coaxial 1 and 2 Digital Audio Switched AC Accessory Outlet RS-232 Reset RS-232 Mode Analog 1-5 Inputs Remote IR Output Surround Back/Zone 2 Speaker Outputs Zone 2 IR Input Subwoofer Output Surround Center Speaker Speaker Outputs Outputs Optical 1 and 2 Digital Audio RS-232 Serial Port NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.*

*com. All connectors are inputs except as indicated. 13 REMOTE CONTROL FUNCTIONS The AVR 254 remote is capable of controlling 7 devices, including the AVR itself. During the installation process, you may program the codes for each of your source components into the remote. Each time you wish to use the codes for any component, first press its Selector button. This changes the button functions to the appropriate codes. Each Source Selector has been preprogrammed to control certain types of components, with only the codes specific to each brand and model changing, depending on which product code is programmed. The AUX Source Selector may be used for any of five device types: a CD player, an HDTV set-top box, a PVD recorder used with cable or satellite television, a TiVO® set-top box or a VCR. The device mode will depend on the product code programmed into the AUX Source Selector as described in the Initial Setup section. CD players use codes beginning with a 0, 1 or 2; VCRs use codes beginning with a 3 or 4; HDTV set-top boxes use codes beginning with a 6; PVDs use codes beginning with a 7 and TiVO set-top boxes use codes beginning with an 8.*

*The remote automatically switches to the correct device mode, and it will operate the device as described in the function list in Table A13 in the appendix. Similarly, the CBL/SAT Source Selector automatically selects cable or satellite television operation depending on the first digit of the product code: 0, 1 or 2 for cable and 3 or 4 for satellite boxes. IMPORTANT NOTE: All of the AVR 254's audio and video inputs are independently assignable. As explained in the Initial Setup section, it is necessary to set up each source, which includes selecting the inputs to which the device is physically connected. Any device may be connected to any compatible input and given any name (e.g. DVD or Game). The Source Selectors' device types may be changed. For example, the TV Source Selector may be reprogrammed to operate a DVD player. Most of the buttons on the remote have dedicated functions, although the precise codes transmitted will vary depending on which source device has been selected for operation.*

*Due to the wide variety of functions unique to various source devices, we have included only a few of the mostoften used functions on the remote, including alphanumeric keys, transport controls, television-channel control, menu access and power on and off. Please refer to the descriptions below for more specific information. Some buttons are only used to operate the AVR, and their functions are available at any time, even if the remote has been switched to another device's mode: AVR Power On and Off, Audio Effects, Video Modes, Surround Modes, Volume and Mute. Press the AVR Settings button near the bottom of the remote to return it to AVR mode. Any given button may have different functions, depending on which component is being controlled.*

*Some buttons are labeled with these functions. For example, the Page Up/Down Buttons are labeled for use as Channel Up/Down Buttons when controlling a television or cable box. See Table A13 in the appendix for listings of the different functions for each type of component. AVR Power On Button: Press this button to turn on the AVR. The Master Power Switch on the AVR 254's front panel must first have been switched on.*

*Device Power Off Button: When the remote has been switched to a device's mode by pressing its Source Selector, press this button to turn off the device. Device Power On Button: When the remote has been switched to a device's mode by pressing its Source Selector, press this button to turn on the device. Mute Button: Press this button to mute the AVR 254's speaker and headphone outputs temporarily. To end the muting, press this button or adjust the volume. Muting is also canceled when the receiver is turned off. AVR Power Off Button: Press this button to turn off the AVR 254. Source Selectors: Press one of these buttons to select a source device, which is a component where a playback signal originates, e.g., DVD, CD, cable TV, satellite or HDTV tuner. This will also turn on the receiver and switch the remote's mode to operate the source device.*

*The first press of the Radio Selector switches the AVR to the last-used tuner band (AM, FM or XM). Each successive press changes the band. Audio Effects: This button is only used to operate the AVR. Press it to directly access the Audio Effects submenu, which allows adjustment of the tone and other controls. Each successive press scrolls to the next line in the menu. See the Initial Setup section for more information. Video Modes: This button is only used to operate the AVR. Press it for direct access to the Video Modes submenu, which contains settings that may be used to improve the picture if necessary after you have adjusted the picture settings using the video display or TV. Each successive press scrolls to the next line in the menu. See the Advanced Functions section for more information.*

*Surround Modes: This button is only used to operate the AVR. Press it to directly access the Surround Modes submenu. Each successive press scrolls to the next line in the menu, or use the //¤ Buttons to scroll to the next line: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Each menu line represents a type of audio signal, and is set to the preferred surround mode that you manually select. Press the OK Button when the menu line is highlighted, and the available surround mode options for the current signal will appear.*

*Use the //¤ Buttons to select the desired mode, and press the OK Button to engage it. Press the Back/Exit Button to exit the Surround Modes menu and display the next higher menu in the hierarchy. See the Advanced Functions section for more information on surround modes. Sleep Settings Button: Press this button to activate the sleep timer, which turns off the receiver after a programmed period of time of up to 90 minutes. Each successive press increases the timer by 10 minutes, ending with the "Sleep Off" message.*

*IR Transmitter Lens: As buttons are pressed on the remote, infrared codes are emitted through this lens. Make sure it is pointing toward the component being operated. 14 14 IR Transmitter Lens AVR Power Off AVR Power On Device Power On Device Power Off Source Selectors Video Modes Surround Modes Audio Effects Alphanumeric Keys Last Back/Exit Activity Menu Navigation OK Disc Menu Teletext Volume Mute Channel Transport Controls Record Info Settings AVR Settings Zone Selector Source Settings Sleep Settings NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com. 15 15 REMOTE CONTROL FUNCTIONS Volume Control: Press this button to raise or lower the volume. Navigation (//¤/ < / > ) and OK Buttons: These buttons are used to make selections within the menu system. These buttons are also used to operate the tuner. Zone Selector: Use this switch to select whether AVR commands will affect the main listening area (Zone 1) or the remote zone of a multizone system (Zone 2). For normal operation, leave the switch in the Zone 1 position.*

*Alphanumeric Keys: Use these buttons to enter numbers for radio station frequencies or to select station presets. Use the alphabetic keys with other products as required. When prompted for a text entry, the first press of the key displays the first letter printed above the key. Each additional press displays the other letters. When the desired letter appears, wait a moment for it to be entered before moving to the next character. Track Skip: These buttons have no effect on the receiver, but are used with source components to change tracks or chapters. Transport Controls: These buttons have no effect on the receiver, but are used to control many source components. Last Channel: When controlling a cable, satellite or HDTV set-top box or a TV, press this button to return to the previous television channel. Activity: This button may be programmed to transmit a series of commands with a single press, which is useful for powering on all devices and selecting the correct settings on each device, or for selecting multi-digit channels with a single press. See the Advanced Functions section for more information on Activities.*

*Back/Exit: Press this button to return to the previous menu or to exit the menu system. This button may have the same effect with some source devices. Menu Button: This button is used to display the main menu on some source devices. To display the AVR 254's main menu, press the AVR Settings Button. Disc Menu: While a DVD is playing, press the DVD Source Selector, then this button, to display the disc's menu.*

*Teletext Buttons: Use these buttons with a Teletext-capable television if your broadcast, cable or satellite provider offers Teletext service. They are normally not used in North America. These buttons are also used to operate some source devices. See Table A13 in the appendix for details. Channel/Page Control: When the tuner has been selected, this control selects a preset radio station.*

*Press these buttons while operating a cable, satellite or HDTV set-top box or a television to change channels. The Page control may be available with some DVD players when playing a DVD Audio disc containing pages of images associated with a track. Record Button: Use this button to make recordings when an audio or video recorder is in use. AVR Settings Button: Press this button to display the AVR's Main Menu. It is also used to switch the remote's device mode from a source device to the AVR. Info Settings Button: Press this button to display the AVR's Info Menu, which contains the settings for the current source. Source Settings Button: Press a Source Selector and then this button to display a source device's settings menu. 16 16 INTRODUCTION TO HOME THEATER The AVR 254 may be the first multichannel surround sound receiver you have owned. Although it has more connections and features than 2-channel receivers, many of the principles are similar and the new concepts are easy to understand. This introductory section will help you to familiarize yourself with the basic concepts, which will make setup and operation smoother.*

If you are already familiar with home theater, you may skip this section and proceed to the Connections section on page 18. are optional. In fact, the AVR 254 enables you to set up a 5.1-channel system in your main listening area, and reassign the surround back channels for use with a multizone system, in which you use the surround back channels to power a pair of loudspeakers located in another room. Many people expect the surround speakers to play as loudly as the front speakers. Although all of the speakers in the system will be calibrated to sound equally loud at the listening position, most artists use the surround speakers for ambient effects only, and they program their materials to steer very little sound to these speakers. · Subwoofer A subwoofer is a special-purpose speaker designed to play only the lowest frequencies (the bass). It may be used to augment smaller, limited-range satellite speakers used for the other channels. In addition, many digital-format programs, such as movies recorded in Dolby Digital and other digital formats, may contain a special low-frequency effects (LFE) channel which is directed only to the subwoofer. The LFE channel packs the punch of a rumbling train or airplane, or the power of an explosion, adding realism and excitement to your home theater.

Many people use two subwoofers, placed on the left and right sides of the room, for additional power and even distribution of the sound. Typical Home Theater System A home theater typically includes an audio/video receiver, which controls the system; a DVD player; a source component for television broadcasts, which may be a cable box, a satellite dish receiver, an HDTV tuner or simply an antenna connected to the TV; a video display (television); and loudspeakers. All of these components are connected using various types of cables for audio and video signals. Multichannel Audio The main benefit of a home theater system is that several loudspeakers are used in various locations around the room to produce "surround sound." Surround sound immerses you in the musical or film presentation for increased realism.

The AVR 254 may have up to seven speakers connected directly to it (plus a subwoofer). Each main speaker is powered by its own amplifier channel inside the receiver. When more than two speakers are used, it is called a multichannel system. · Front Left and Right The main speakers are used the same way as in a 2-channel system. However, you may notice that in many surround modes, these speakers are used more for ambient sound while the main action, especially dialogue, is moved to the center speaker.

· Center The center speaker is usually placed above or below the video screen, and is used mostly for dialogue in movies and television programs. This placement allows the dialogue to originate near the actors' faces, for a more natural sound. · Surround Left and Right The surround speakers are used to improve directionality of ambient sounds. In addition, by using more loudspeakers in the system, more dynamic soundtracks may be played without risk of overloading any one speaker. · Surround Back Left and Right Additional surround speakers may be placed behind the listening position, improving the precision with which ambient sounds may be placed and allowing for more realistic-sounding pans. By using more speakers in the system, the same sound levels may be attained with less burden placed on any individual speaker. The surround back speakers may also be used with specialized surround modes that are designed for use with 7.1-channel systems, such as Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, DTS-ES (Discrete and Matrix), DTS-HD High Resolution Audio, DTS-HD Master Audio and Logic 7 (7.1 modes). However, the surround back speakers 17 Surround Modes There are different theories as to the best way to present surround sound and to distribute soundtrack information among the various speakers.

A variety of algorithms have been developed in an effort to accurately reproduce the way we hear sounds in the real world. The result is a rich variety of surround mode options. Some modes are selected automatically, depending on the signal being received from the source. In many cases, you may select a surround mode manually. Several companies have taken surround sound in slightly differing directions. It is helpful to group the numerous surround modes: · Dolby Laboratories, Inc. Modes Dolby TrueHD, Dolby Digital Plus, Dolby Digital, Dolby Digital EX, Dolby Pro Logic II and IIx, Dolby Virtual Speaker, Dolby Headphone · DTS Modes DTS-HD, DTS-HD Master Audio, DTS, DTS-ES (Discrete and Matrix), DTS Neo:6, DTS 96/24 · Harman International (the Harman Kardon parent company) Logic 7 · Stereo Modes Generic modes that expand upon conventional 2-channel stereo, including 5- and 7-Channel Stereo Table A12 in the appendix contains detailed explanations of the differences between the various mode groups, and the mode options available within each group. Digital modes, such as Dolby Digital and DTS, are only available with specially encoded programs, such as HDTV, DVDs and digital cable or satellite television. Other modes may be used with various digital and analog signals to create a different surround presentation, or to use a different number of speakers. Surround mode selection depends upon the number of speakers in your system, the materials you are watching or listening to, and your personal tastes.

Feel free to experiment. 17 CONNECTIONS There are different types of audio and video connections used to connect the receiver to the speakers and video display, and to connect the source devices to the receiver. To make it easier to keep them all straight, the Consumer Electronics Association (CEA®) has established a color-coding standard. See Table 1. Table 1 Connection Color Guide Audio Connections Left Front (FL/FR) Center (C) Surround (SL/SR) Surround Back (SBL/SBR) Subwoofer (SUB) Right Bare wire cables are installed as follows (see Figure 2): 1. Unscrew the terminal cap until the pass-through hole in the collar is revealed. 2. Insert the bare end of the wire into the hole. 3. Hand-tighten the cap until the wire is held snugly.

Digital Audio Connections Coaxial Optical Input 1 2 3 Figure 2 Binding-Post Speaker Terminals With Bare Wires Pr Video Connections Component Composite S-Video Y Pb Subwoofer The subwoofer is a specialized type of loudspeaker used to play only the low frequencies (bass), which require much more power than the other speaker channels. In order to obtain the best results, most speaker manufacturers offer powered subwoofers, in which the speaker contains its own amplifier on board. Usually, a line-level (nonamplified) connection is made from the receiver's Subwoofer Output to a corresponding jack on the subwoofer, as shown in Figure 3, but sometimes the subwoofer is connected to the receiver using the front left and right speaker outputs, as with passive in-wall subwoofers, and then the front left and right speakers are connected to terminals on the subwoofer.

*Although the subwoofer output looks similar to the analog audio jacks used for the various components, it is filtered and only allows the low frequencies to pass. Don't connect this output to any other devices. Although doing so won't cause any harm, performance will suffer. HDMI Connections (digital audio/video) TM HDMI Types of Connections This section will briefly review different types of cables and connections. Speaker Connections Speaker cables carry an amplified signal from the receiver's speaker terminals to each loudspeaker. Speaker cables contain two wire conductors, or leads, inside plastic insulation. The two conductors are usually differentiated in some way, by using different colors, or stripes, or by adding a ridge to the insulation.*

*Sometimes the wires are different, colors e.g. copper-colored and silver. The differentiation is important because each speaker must be connected to the receiver's speaker-output terminals using two wires, one positive (+) and one negative (), referred to as speaker polarity. It's important to maintain the proper polarity for all speakers in the system, or performance can suffer, especially for the low frequencies. Always connect the positive terminal on the loudspeaker, which is usually colored red, to the positive terminal on the receiver, which is colored as shown in the Connection Color Guide (Table 1). Similarly, always connect the black negative terminal on the speaker to the black negative terminal on the receiver. The AVR 254 uses binding-post speaker terminals that can accept banana plugs or bare-wire cables. Banana plugs are simply plugged into the hole in the middle of the terminal cap. See Figure 1.*

*Preout Figure 3 Subwoofer Subwoofer Connecting Source Devices to the AVR The AVR 254 is designed to process audio and video input signals, playing back the audio and displaying the video on a television or monitor connected to the AVR. These signals originate in what are known as "source devices," including your DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television box or MP3 player. Although the tuner is built into the AVR, it also counts as a source, even though no external connections are needed, other than the FM and AM antennas and the XM antenna module. Separate connections are required for the audio and video portions of the signal, except for digital HDMI connections. The types of connections used depend upon what's available on the source device, and for video signals, the capabilities of your video display.*

*+ Figure 1 Binding-Post Speaker Terminals With Banana Plugs 18 18 CONNECTIONS Audio Connections There are two formats for audio connections: digital and analog. Digital audio signals are required for listening to sources encoded with digital surround modes, such as Dolby Digital and DTS, or for non-compressed PCM digital audio. There are three types of digital audio connections: HDMI, coaxial and optical. Any type of digital audio connection may be used for each source device, but never more than one for the same source. However, it's okay to make both analog and digital audio connections to the same source.*

*NOTE: Since HDMI signals may carry both audio and video, if your video display device has an HDMI input, make a single HDMI connection from your source device (such as a DVD player) to the AVR. No separate digital audio connection is usually required. Make sure to turn the volume on your television all the way down. If your video display or source device is not HDMI-capable, use one of the analog video connections (composite, S- or component video) and, if available on your source device, either a coaxial or optical digital audio connection. Coaxial digital audio jacks are usually color-coded in orange. Although they look similar to analog jacks, they should not be confused, and you should not connect coaxial digital audio outputs to analog inputs or vice versa. See Figure 5. Coaxial digital audio cable Figure 5 Coaxial Digital Audio Coaxial Digital Audio The AVR 254 is equipped with three HDMI (High-Definition Multimedia Interface) inputs, and one output. HDMI technology enables digital audio and video information to be carried using a single cable, thus delivering the highest quality picture and sound. There are different HDMI versions, depending on the capability of the source device and the type of signal it is capable of transmitting.*

*In addition, receivers and processors such as the AVR 254 may handle the incoming signal in several different ways, depending on their capability as well. The AVR 254 uses HDMI version 1.3a, and is capable of processing both the audio and video components of the HDMI data, minimizing the number of cable connections in your system. Thanks to the higher bandwidth and speed of HDMI version 1.3a, the AVR 254 implements Deep Color, which increases by an order of magnitude the shades of color that can be displayed; and the latest lossless multichannel audio formats, including Dolby TrueHD and DTS-HD Master Audio. NOTE: Some DVD-Audio, SACD, HD-DVD and Blu-ray Disc players, output mulitchannel audio only through the source's multichannel analog outputs. For those devices, make a separate analog audio connection in addition to the HDMI connection, which is still used for video and to listen to Dolby Digital, DTS or PCM materials that may be stored on the disc. In addition, the AVR 254 will convert analog video signals to the HDMI format, upscaling to high-definition 1080p resolution. You may view the AVR 254's own on-screen display menus using the HDMI output. The physical HDMI connection is simple.*

*The connector is shaped for easy plug-in (see Figure 4). If your video display has a DVI input and is HDCP-compliant, you may use an HDMI-to-DVI adapter (not included) to connect it to the AVR's HDMI Output, but a separate audio connection is required. HDMI cable runs are usually limited to about 10 feet, depending on the type of cable used. Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted.*

*Input connectors are color-coded using a black shutter, while outputs use a gray shutter. See Figure 6. Optical digital audio cable Figure 6 Optical Digital Audio Optical Analog Audio Analog connections require two cables, one for the left channel (white) and one for the right channel (red). These two cables are often attached to each other for most of their length. See Figure 7.*

*Most sources that have digital audio jacks also have analog audio jacks, although some older types of sources, such as tape decks, only have analog jacks. For sources that are capable of both digital and analog audio, you may make both connections. The analog audio connection is strongly recommended if you intend to use the source with the multizone system. It's required if you will be using the multizone preamp outputs with an external amplifier to power your remote speakers, as the AVR 254's multizone system is not capable of converting the digital signal to analog format.*

It's suggested that you also use the analog audio connections when using the Surround Back/Zone 2 speaker outputs, in case another two-channel digital audio source is in use in the main listening area. The AVR 254 is only capable of processing one PCM source at a time. You may only record materials from DVDs or other copy-protected sources, using analog connections. Remember to comply with all copyright laws, if you choose to make a copy for your own personal use. Analog audio cable (RCA) L R Figure 7 Analog Audio Figure 4 HDMI Connection Multichannel analog connections are used with some high-definition sources where the copy-protected digital content is decoded inside the source. These types of connections are usually used with DVD-Audio, SACD, Blu-ray Disc, HD-DVD and other multichannel players.

See Figure 8. However, the multichannel analog audio connection is not 19 19 CONNECTIONS required for DVD-Audio players compliant with HDMI version 1.1 or better, or HD-DVD and Blu-ray Disc players that decode the digital audio internally and output linear PCM signals in digital format. Consult the owner's guide for your disc player for more information. Composite video cable Figure 10 Composite Video Front Surround Center Multichannel analog audio cable (RCA) Subwoofer S-video, or "separate" video, transmits the chrominance and luminance components using separate wires contained within a single cable. The plug on an S-video cable contains four metal pins, plus a plastic guide pin. Be careful to line up the plug correctly when you insert it into the jack on the receiver, source or video display. See Figure 11. S-video cable Figure 11 S-Video Figure 8 Multichannel Analog Audio The AVR 254 also offers an analog audio input on the rear panel in the form of a stereo 1/8" mini jack. Connect the headphone output of any audio source, such as an MP3 player or portable CD player, to the Stereo Jack input.

See Figure 9. Component video separates the video signal into three components  one luminance ("Y") and two sub-sampled color signals ("Pb" and "Pr") that are transmitted using three separate cables. The "Y" cable is colorcoded green, the "Pb" cable is colored blue and the "Pr" cable is colored red. See Figure 12. Figure 9 Stereo Jack Component video cable Video Connections Although some sources only produce an audio signal (e. g., CD player, tape deck), many sources output both audio and video signals (e.g., DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to the audio connection, make one type of video connection for each of these sources (only one at a time for any source).

Figure 12 Component Video If it's available on your video display, an HDMI connection is recommended as the best quality connection, followed by component video, S-video and then composite video. NOTES: · Copy-protected sources are not available at the Component Video Monitor Outputs. · Standard and high-definition analog video signals are upscaled to 1080i resolution for the Component Video Monitor Outputs. For improved video performance, consider upgrading to an HDMI-capable video display with 1080p resolution. Digital Video If you have already connected a source device to one of the HDMI inputs as explained in the Digital Audio Connections section, you have automatically made a video connection at the same time, as the HDMI signal includes both digital audio and video components. If the source device is not capable of transmitting its digital audio signal through the HDMI connection, use one of the coaxial or optical digital audio inputs for the source. If a multichannel analog audio connection is required for certain lossless formats (e.g., DVD-Audio, SACD, HD-DVD or Blu-ray Disc), you may make both audio connections. To listen to the multichannel disc, set the Audio Auto Polling setting to the 6/8CH inputs, and the AVR will automatically select it when no digital signal is output by the player.

Antennas The AVR 254 uses separate terminals for the included FM and AM antennas that provide proper reception for the tuner. The FM antenna uses a 75-ohm F-connector. See Figure 13. Analog Video There are three types of analog video connections: composite video, S-video and component video. Composite video is the basic connection most commonly available. The jack is usually color-coded yellow, and looks like an analog audio jack, although it is important never to confuse the two. Do not plug a composite video cable into an analog or coaxial digital audio jack, or vice versa. Both the chrominance (color) and luminance (intensity) components of the video signal are transmitted using a single cable. See Figure 10. 20 Figure 13 FM Antenna The AM loop antenna needs to be assembled.

Connect the two leads to the spring terminals on the receiver. As AM antenna leads have no polarity, it doesn't matter which of the two terminals is used for either lead. See Figure 14. 20 CONNECTIONS Figure 14 AM Antenna To enjoy XM satellite radio, purchase an XM antenna module designed for use with XM Ready devices and a subscription to the XM service. We recommend the XM Mini Tuner and Home Dock Bundle, available at www. xmradio.com. The older Connect and Play module is also compatible with the AVR 254, but it may no longer be available in your area. An XM Ready-compatible module uses the special connector on the AVR 254's rear panel that allows you to use the AVR's tuner, including its 40 preset station locations and remote control. Although you may use a module with standard audio connections, which may be indicated for "car and home use," you will not be able to enjoy the AVR 254's ease of control.

RS-232 Serial Port The RS-232 serial port on the AVR 254 is used only for software upgrades. If we release an upgrade for the receiver's operating system at some time in the future, it may be downloaded to the AVR using this port. Complete instructions will be provided at that time. 21 SPEAKER PLACEMENT Before you begin to connect cables, it is important to place your speakers in their correct locations in the room. Optimally, the speakers should be placed in a circle with the listening position at its center. The distance from the listening position to the video display forms the radius of the circle. The speakers should be angled so that they directly face the listening position. Placement of Surround Speakers in a 5.1-Channel System The side surround speakers should be placed 110 degrees from the center speaker, that is, slightly behind and angled toward the listener. If this isn't feasible, place them behind the listener, with each surround speaker facing the opposite-side front speaker.

See Figure 15. The surround speakers may be placed a little higher than the listener's ears.

*Front Speaker Placement The center speaker is placed either on top of, below or mounted on the wall above or below the video display screen. The front left and right speakers are placed along the circle, about 30 degrees from the center speaker and angled toward the listener. It is best to place the front left/right and center speakers as close to the same height as possible, preferably at about the same height as the listener's ears. In any event, the center speaker should be no more than two feet above or below the left/right speakers. Placement of the surround speakers depends on the number of speakers in your system. If you're using only two speakers with the AVR 254, place them in the front left and right positions, and skip to the Installation section. However, we recommend using the AVR 254 in a 5.1- or 7.*

*1-channel configuration for optimal surround sound performance. SUB C FL 30° 30° Placement of Surround Speakers in a 7.1-Channel System In a 7.1-channel system, the side surround speakers are placed 90 degrees from the center speaker, directly to either side of the listening position. The surround back left and right speakers are placed 150 degrees from the center speaker, or directly facing the opposite-side front speaker.*

*See Figure 16. SUB C FL 30° 30° FR SL 90° 150° 150° 90° SR FR SBL SBR 110° 150° 150° 110° Figure 16  Speaker Placement (7.1-Channel System) SL SR Alternate placement for Side Surround Left Speaker Alternate placement for Side Surround Right Speaker NOTE: Some speaker manufacturers offer 6.1-channel speaker systems, which are compatible with 6.1-channel surround sound formats, such as Dolby Digital EX, DTS-ES Discrete and Matrix modes and DTS Neo:6 mode.*

*We do not recommend using the AVR 254 in a 6.1-channel configuration. In fact, the 6.1-channel formats will sound better when played through a 7.1-channel system. The same surround back channel information is played through both surround back speakers, but with twice the power and clarity. If you wish to use the AVR 254 with a 6.1-channel speaker system, place the single surround back speaker directly behind the listener, but do not connect it until after you have run the EzSet/EQ procedure for a 5.1-channel system. After the EzSet/EQ process finishes, connect the surround back speaker to the Surround Back Left Speaker Output.*

*Then follow the directions in the Advanced Features section for manual setup of the surround back speaker. Figure 15  Speaker Placement (5.1-Channel System) 22 SPEAKER PLACEMENT Subwoofer Placement The subwoofer's location is less critical, since low-frequency sounds are omnidirectional. Placing the subwoofer close to a wall or in a corner will reinforce the low frequencies, and may create a "boomy" sound. Experiment by placing the subwoofer where the listener normally sits and then walk around the room until the low frequencies sound best. Place the subwoofer in that spot. In some installations it may be desirable to use two subwoofers for a 7.2-channel system. This is easily done by purchasing an optional Y-Adapter with one male RCA plug and two female RCA jacks. Connect the male jack to the Subwoofer output on the AVR's rear panel, and then run a standard interconnect cable from the Y-Adapter to the Line Input of each subwoofer.*

*You may then place the two speakers as best suits the requirements of the room and your listening preferences. NOTE: Your receiver will sound its best when the same model loudspeaker is used for all positions (other than the subwoofer). If that isn't possible, try to use speakers made by the same manufacturer. 23 INSTALLATION You are now ready to connect the various components to the receiver. Before beginning, turn off all components, including the AVR 254, and unplug their power cords.*

*Don't plug in any of the power cords until you have finished making all of your connections. Remember that the receiver generates heat while it is on. Select a location that leaves several inches of space on all sides of the receiver. Avoid completely enclosing the receiver inside an unventilated cabinet. It is preferable to place components on separate shelves rather than stacking them directly on top of the receiver.*

*Some surface finishes are delicate. Try to select a location with a sturdy surface finish. AVR 254 SUB Figure 18  Subwoofer Connection Step Three  Connect the Antennas Connect the FM and AM antennas to their terminals. If you have purchased an XM antenna module designed for connection to an XM Ready device, connect it now. To enjoy XM Radio, remember to purchase a subscription and activate your antenna module. More information is available at www.xmradio.com. See Figure 19. Step One  Connect the Speakers If you have not yet done so, place your speakers in the listening room, as described in the Speaker Placement section above.*

*Connect the center, front left, front right, surround left, surround right, surround back left and surround back right loudspeakers to the corresponding speaker terminals on the AVR 254. See Figure 17. Maintain the proper polarity by always connecting the positive and negative terminals on each speaker to the positive and negative terminals on the receiver. Use the Connection Color Guide on page 18 as a reference. AVR 254 AM FM C AVR 254 Figure 19  Antenna Connections Step Four  Connect the Source Components A source is a device where the audio and video signals originate. Some sources, such as CD players, only offer audio, while sources used for watching movies or broadcast-television programming deliver a video signal as well. Referring to the photograph of the AVR 254 remote control on page 15, there is a section of 7 buttons near the top of the remote designated "Source Selectors": Cable/Sat, DVD, Media Server, Radio, TV, Game and AUX. Each of these buttons corresponds to a "source input". The AVR 254's flexible design allows you to use almost any combination of audio and video connections for each source device. The goal of Step Four of the Installation is to match up each of your source devices, e. g., DVD player and cable television box, with the correct connectors on the AVR 254. You may connect a source device to any appropriate input connectors. Note which audio and video inputs are used for each device in Table A5 in the appendix. Table A2 indicates the default input-connection assignments, any of which may be changed to match the actual connections in your system.*

*The precise connections to be made depend on the capabilities of the source device and your video display (TV). Select the best audio and video connections for each source. The types of connections are listed in order of preference: FR FL SBR SBL SR SL Figure 17  Speaker Connections NOTE: If you only have one surround back speaker, wait until after you have run the EzSet/EQ process in the Initial Setup section before connecting it to the Surround Back Left speaker outputs.*