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You can read the recommendations in the user guide, the technical guide or the installation guide for HARMAN KARDON AVR 154. You'll find the answers to all your questions on the HARMAN KARDON AVR 154 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 154

User guide HARMAN KARDON AVR 154

Operating instructions HARMAN KARDON AVR 154

Instructions for use HARMAN KARDON AVR 154

Instruction manual HARMAN KARDON AVR 154

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AVR 154
AUDIO/VIDEO RECEIVER
OWNER'S MANUAL



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Manual abstract:

3. 4. 5. 6. Read these instructions. Keep these instructions. 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 grounding type 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. Unplug this apparatus during lightning storms or when unused for long periods of time. 14. Refer all servicing to qualified service personnel.

Service is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped. Wet Location Marking Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus. Service

Instructions CAUTION These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions, unless you are qualified to do so. Outdoor Use Marking WARNING To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. 2 SAFETY INFORMATION Important Safety Information Verify Line Voltage Before

Use Your AVR 154 has been designed for use with 120-volt AC current. 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 Harman Kardon's 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. 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. 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. 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.



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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 154 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 10 12 15 16 16 16 16 17 17 17 17 18 18 19 20 20 20 20 25 25 25 26 27 28 28 29 29 29 30 31 31 33 34 34 34 34 34 35 35 35 35 36 36 37 37 38 39 39 39 39 40 40 41 41 44 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 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 Turn On the AVR 154 INITIAL SETUP Using the On-Screen Menu System Step One Determine Speaker Size Step Two Measure Speaker Distances Step Three Manual Setup Menu Speaker Size Menu Speaker Crossover Menu Delay Adjust Menu Step Four Output Level Calibration Step Five Configure Sources OPERATION Turning On the AVR 154 Sleep Timer Volume Control Mute Function Tone Controls Headphones Source Selection Audio Input Selection Video Input Selection 6-Channel Direct Inputs Using the Tuner Recording AUX Input Selecting a Surround Mode ADVANCED FUNCTIONS Audio Processing and Surround Sound Analog Audio Signals Digital Audio Signals Surround Modes Dolby Surround Settings Default Modes System Settings Dim Function 44 Advanced Remote Control Functions 44 Punch-Through Programming 45 Macros 45 Resetting the Remote 45 Processor Reset 45 Memory 46 TROUBLESHOOTING GUIDE 47 APPENDIX 58 TECHNICAL SPECIFICATIONS 58 Trademark Acknowledgements 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 polarisée: 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 product on our Web site at www.harmankardon.com.

Note: You'll need the product's serial number. At the same time, you can choose to be notified about our new products and/or special promotions. WWW.HARMANKARDON.COM Thank you for choosing Harman Kardon! In the years since Harman Kardon invented the high-fidelity receiver, we have taken to heart the philosophy of bringing the joy of home entertainment to as many people as automatic (seeks frequencies with acceptable signal strength) tuning mode.

It also toggles between stereo and mono modes when an FM station is tuned. Preset Stations: Press this button to select a preset radio station. Headphone Jack: Plug a 1/4" headphone plug into this jack for private listening. Standby/On Switch: This electrical switch turns the receiver on for playback, or leaves it in Standby mode for quick turn-on using this switch or the remote control. Power Indicator: This LED has four possible modes: · Main Power Off: When the AVR is unplugged or the Main Power Switch is off, this LED remains unlit.

· Standby: This LED turns amber, indicating that the AVR is ready to be turned on. · On: This LED turns white, and the AVR operates normally. · Protect: If this LED ever turns red, turn off the AVR and unplug it. Check all speaker wires for a possible short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again. When the main power is turned off, the LED is dark and the receiver won't respond to any button presses. When the main power is turned on, but before the Standby/On Switch is used, the LED turns amber to indicate that the receiver is in standby mode and is ready to be turned on. When the receiver is turned on, the LED turns white. Surround Mode: Press this button to select a surround sound (e.g.

, multichannel) mode group. Choose from the Dolby modes, DTS modes, Logic 7 modes, DSP modes or Stereo modes.



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Surround Select: After you have selected the desired surround mode group, press this button to select a specific mode. **Analog Audio, Video and Digital Audio Inputs:** Connect a source component that will only be used temporarily, such as a camera or game console to these jacks. Use only one type of audio and one type of video connection. **Speaker/Channel Input Indicators:** The box icons indicate which speaker positions you have configured (see the Initial Setup section), and the size (frequency range) of each speaker. When a digital audio input is used, letters will light inside the boxes to indicate which channels are present in the incoming signal. **Source Select:** Press this button to select a source device, which is a component where a playback signal originates, e.g., DVD, CD, cable TV, satellite or HDTV tuner.

The source's name will appear in the Message Display. **Remote IR Sensor:** This sensor receives infrared (IR) commands from the remote control. It is important to ensure that it is not blocked. If covering the sensor is unavoidable, such as when the AVR 154 is placed inside a cabinet, you may use an optional Harman Kardon HE 1000, or other infrared receiver, with an IR emitter ("blaster") placed directly over this sensor. **Volume Knob:** Turn this knob to raise or lower the volume, which will be shown in decibels (dB) in the Message Display.

Message Display: Various messages appear in this two-line display in response to commands and changes in the incoming signal. In normal operation, the current source name and the analog or digital audio input assigned to it appear on the upper line, while the surround mode is displayed on the lower line.

When the on-screen display menu system (OSD) is in use, the message OSD ON will appear to remind you to check the video display. **8 Message Display Speaker/Channel Input Indicators Volume Remote IR Sensor Power Indicator Tuning Surround Select Surround Mode Preset Stations Tuner Band Source Select Headphone Jack Tuning Mode Standby/On Switch Main Power Switch Digital Audio Inputs (Optical 3 and Coaxial 3) Video 3 Video Inputs Video 3 Analog Audio 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 REAR-PANEL CONNECTIONS AM and FM Antenna Terminals: Connect the included AM and FM antennas to their respective terminals for radio reception. **Front, Center and Surround Speaker Outputs:** Use two-conductor 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. **Subwoofer Output:** If you have a powered subwoofer with a line-level input, connect it to this jack. **Coaxial Digital Audio Output:** If a source is also a digital audio recorder, connect the coaxial digital audio output to the recorder's coaxial digital input. **AUX Input:** 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-Channel Analog Audio 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. **Component Video Inputs:** If both your video source (e.g., DVD player or HDTV tuner) and your television or video display have analog component video (Y/Pb/Pr) capability, then you may connect the component video outputs of your source to one of the two component video inputs. Do not make any other video connections to that source. **Video 1, Video 2 and DVD Audio/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. **NOTE:** If a source is HDMI-capable, it is preferable to connect it to one of the AVR's HDMI Inputs.

If HDMI is not available on the source, then select one of the following types of video connection for each source device, in order of preference: component video, S-video or composite video. See the Connections section for more information on audio and video connection options. **Component Video Monitor Outputs:** If you are using either of the Component Video Inputs and your television or video display is component-video-capable, connect these jacks to the corresponding inputs on your video display. In addition, connect the composite and/or S-video monitor outputs to your video display to view the AVR 154's on-screen menu displays. **HDMI Inputs and Output:** HDMI (High-Definition Multimedia Interface) is a newer type of connection for transmitting digital audio and video signals between devices.

Although the AVR 154 is not capable of processing HDMI signals, if your video display is HDMI-capable, connect up to three HDMI sources here, and then connect the HDMI Output to your video display for improved video performance. Disable the HDMI audio function of your video display, and make a separate digital audio connection from the source device to one of the AVR's coaxial or optical digital audio inputs to benefit from the AVR 154's multichannel audio processing. **NOTE:** The AVR 154 does not convert other types of video to HDMI, and you will not be able to view the on-screen displays using the HDMI connection. **Video 1 Audio/Video Outputs:** These jacks may be used to connect your VCR or another recorder. **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.

CD and Tape Audio Inputs: These jacks may be used to connect audio-only source components (e.g., CD player, tape deck). Do not connect a turntable to these jacks unless you are using it with a phono preamp. **Tape Outputs:** These jacks may be used to connect a CDR or another audio-only recorder. **Coaxial and Optical Digital Audio Inputs:** If your source has a compatible digital audio output, connect it to one of these jacks for improved audio performance. Use only one type of digital audio connection for each source. **10 FM Antenna Video 1 A/V Outputs DVD A/V Inputs HDMI Monitor Output AC Power Cord AUX Input Component Video Inputs (1 and 2) Component Video Monitor Outputs Tape Outputs Video 2 A/V Inputs HDMI Inputs (1, 2 and 3) Video 1 A/V Inputs Video Monitor Outputs Tape AM Antenna Inputs CD Inputs Subwoofer Output Front Speaker Outputs Coaxial Digital Audio Output Surround 6-Channel Speaker Analog Audio Outputs Inputs Center Speaker Outputs Optical Digital Audio Inputs Coaxial Digital (1 and 2) Audio Inputs (1 and 2) 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.



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11 REMOTE CONTROL FUNCTIONS The AVR 154 remote is capable of controlling up to 11 devices, including the AVR itself and a device connected to the Auxiliary Input. 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 the Selector button for that component. This changes the button functions to the appropriate codes. Each Input 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 device types programmed into each selector, except the HDMI selectors, may not be changed. Input 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.

AM/FM Button: Press this button to select the tuner as the source, or to switch between the AM and FM bands. **6-Channel Input Selector:** Press this button to select the 6-Channel Inputs as the audio source. If a signal is present at the component video inputs assigned to this source, it will be used. If not, the receiver will use the video input and remote control codes for the last-selected analog video source. **DVD:** Controls DVD players and recorders.

CD: Controls CD players and recorders. **Tape:** Controls cassette decks. **Video 1:** Controls VCRs, TiVo devices and DVRs, and the Harman Kardon DMC 1000 digital media center. **Ⓢ Test Tone:** Press this button to activate the test tone for manual output-level calibration. **TV/Video:** This button has no effect on the receiver, but is used to switch video inputs on some video source components.

Sleep 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. **Video 2:** Controls cable and satellite television set-top boxes. **Video 3:** Controls televisions and other video displays. **HDMI 1, 2 and 3:** Each code set controls a source device (VCR/PVR/DVD player or cable/satellite set-top box) connected to one of these inputs. **Volume Controls:** Press these buttons to raise or lower the volume, which will be shown in decibels (dB) in the Message Display. **AUX:** Controls a device connected to the Auxiliary Input. Any given button may have different functions, depending on which component is being controlled. Some buttons are labeled with these functions. For example, the Sleep and DSP Surround Buttons are labeled for use as Channel Up/Down Buttons when controlling a television or cable box. See Table A8 in the appendix for listings of the different functions for each type of component.

DSP Surround: Press this button to select a DSP surround mode (Hall 1, Hall 2, Theater). **On-Screen Display (OSD):** Press this button to activate the on-screen menu system. **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. **Channel Level:** Press this button to adjust the output levels for each channel so that all speakers sound equally loud at the listening position. Usually this is done while playing an audio selection, such as a favorite CD, after you have configured the speakers, as described in the Initial Setup section. **Speaker Setup:** Press this button to configure speaker sizes, that is, the low-frequency capability of each speaker. Usually this is done using the on-screen menu system, as described in the Initial Setup section. **Navigation (⏪/⏩/⏴/⏵) and OK Buttons:** These buttons are used to make selections within the on-screen menu system, or when accessing the functions of the four buttons surrounding this area of the remote Channel Level, Speaker Setup, Digital Input or Delay. **Power On Button:** Press this button to turn on the AVR or another device.

The Main Power Switch on the AVR 154's front panel must first have been switched on. **Mute Button:** Press this button to mute the AVR 154'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. **Digital Input Select:** Press this button to select the specific digital audio input (or analog audio input) you used for the current source.

Program Indicator: This LED lights up or flashes in one of three colors as the remote is programmed with codes. **Delay:** Press this button to set delay times that compensate for placing the speakers at different distances from the listening position, or to resolve a "lip sync" issue that may be caused by digital video processing. This may also be done using the on-screen menu system, as described in the Initial Setup section. **Power Off Button:** Press this button to turn off the AVR 154 or another device. **AVR Selector:** Press this button to switch the remote to the codes that operate the receiver.

Numeric Keys: Use these buttons to enter radio station frequencies or to select station presets. Press the Direct Button before entering the station frequency.

12 IR Transmitter Lens Power On Program Indicator AVR Selector AM/FM Test Tone Sleep DSP Surround On-Screen Display Channel Level 6-Channel Input Selector Volume Controls TV/Video Speaker Setup Navigation Digital Input OK Delay Mute Power Off Input Selectors Numeric Keys Tuning Mode Direct Station Entry Tuning Tone Mode Memory Clear Preset Stations Selectors Disc Skip Macros Surround Mode Selectors Dim Night Mode Track Skip Transport Controls 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. **13 REMOTE CONTROL FUNCTIONS Tuning Mode:** This button toggles between manual (one frequency step at a time) and automatic (seeks frequencies with acceptable signal strength) tuning mode. It also toggles between stereo and mono modes when an FM station is tuned. **Memory:** After you have tuned a particular radio station, press this button, then the numeric keys, to save that station as a radio preset. **Macros:** These buttons may be programmed to execute long command sequences with a single button press. They are useful for programming the command to turn on or off all of your components, or for accessing specialized functions for a different component than you are currently operating.

Surround Mode Selectors: Press any of these buttons to select a type of surround sound (e.g., multichannel) mode. Choose from the Dolby modes, DTS modes, Logic 7 modes or Stereo modes. Each press of a button will cycle to the next available variant of that mode. Not all modes or mode groups are available with all sources. **Tuning:** Press these buttons to tune a radio station.



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Depending on whether the tuning mode has been set to manual or automatic, each press will either change one frequency step at a time, or seek the next frequency with acceptable signal strength. Direct: Press this button before using the Numeric Keys to directly enter a radio station frequency. Night Mode: Press this button to activate Night mode with specially encoded Dolby Digital discs or broadcasts.

Night mode compresses the audio so that louder passages are reduced in volume to avoid disturbing others, while dialogue remains intelligible. Clear: Press this button to clear a radio station frequency you have started to enter. Track Skip: These buttons have no effect on the receiver, but are used with many source components to change tracks or chapters. Preset Stations Selector: Press these buttons to select a preset radio station. Dim: Press this button to partially or fully dim the front-panel display.

Transport Controls: These buttons have no effect on the receiver, but are used to control many source components. By default, when the remote is operating the receiver, these buttons will control a DVD player. Tone Mode: Press this button to access the tone controls (bass and treble). Use the Navigation Buttons to make your selections. Disc Skip: This button has no effect on the receiver, but is used with some optical disc changers to skip to the next disc.

14 14 INTRODUCTION TO HOME THEATER The AVR 154 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 16. (LFE) channel which is directed only to the subwoofer. The LFE channel packs the punch of an explosion or the power of a rumbling train or airplane, 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. 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 either by their brand name, or by using a generic name: · Dolby Laboratories, Inc., Modes Dolby Digital, Dolby Pro Logic II, Dolby Virtual Speaker, Dolby Headphone · DTS Modes DTS, DTS Neo:6, DTS 96/24 · Harman International (Harman Kardon's Parent Company) Logic 7 · DSP Modes Generic modes that include Hall 1, Hall 2 and Theater · Stereo Modes Generic modes that expand upon conventional 2-channel stereo, including DSP Surround Off, Analog Bypass Surround Off and 5-Channel Stereo Table 2 on pages 42 43 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 DVDs and digital 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. Typical Home Theater System A home theater typically includes your 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 by 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 154 may have up to five 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. Many people expect the surround speakers to play as loud 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, contain a special low-frequency effects 15 15 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) 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.



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2. Insert the bare end of the wire into the hole. 3. Screw the cap back into place until the wire is held snugly. Digital Audio Connections Coaxial Optical Input 1 2 3 Figure 2 Binding-Post Speaker Terminals With Bare Wires Video Connections Component Composite S-Video Y Pb Pr 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, 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 your other devices.

Although doing so won't cause any harm, performance will suffer. HDMI Connections (switching only) 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 generally 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 (-). This is called 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 154 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. Pre-out Figure 3 Subwoofer Subwoofer Connecting Source Devices to the AVR The AVR 154 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. Separate connections are required for the audio and video portions of the signal.

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 16 16 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. The AVR 154 uses two types of digital audio connections: coaxial and optical. Either type of digital audio connection may be used for each source device, but never both simultaneously for the same source. However, it's okay to make both analog and digital audio connections to the same source. NOTE: Although HDMI cables are capable of carrying digital audio signals, the AVR 154 is not designed to process those signals. Therefore, if your source and video display are both HDMI-capable, use the HDMI connections for video only. Make a separate audio connection from the source device to the AVR 154, and consult the owner's manual for the source device for instructions on muting the device's HDMI audio output. the source.

These types of connections are usually used with DVDAudio, SACD, Blu-ray Disc, HD-DVD and other multichannel players. See Figure 7. Front Surround Center Multichannel analog audio cable (RCA) Subwoofer Figure 7 Multichannel Analog Audio Digital Audio 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 4.

Coaxial digital audio cable Figure 4 Coaxial Digital Audio Coaxial NOTE: When using the 6-Channel Analog Audio Inputs, make an analog video connection for the device. To enjoy a multichannel disc, select the source input for the video connection, e.g., DVD, or simply use the component video inputs assigned to the 6-Channel Analog Audio Inputs (see Initial Setup section for an explanation on assigning video inputs), then select the 6-Channel Analog Audio Inputs as the source. If no signal is present at the component video inputs assigned to the 6-Channel Analog Audio Inputs, the AVR 154 will use the last-selected analog video input, which is DVD in this example.

It is not possible to select an HDMI input for video while using the 6-Channel Analog Audio Inputs for audio. The AVR 154 also offers an Auxiliary 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 Auxiliary Audio Input. See Figure 8. 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 5. Optical digital audio cable Figure 5 Optical Digital Audio Figure 8 Auxiliary Audio Input Optical Video Connections Although some sources produce an audio signal only (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 (but only one at a time for any source). 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.



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See Figure 6. Most sources that have digital audio jacks also have analog audio jacks, although some older types of sources, such as tape decks, have only analog jacks. For sources that are capable of both digital and analog audio, you may wish to make both connections. If you wish to record materials from DVDs or other copy-protected sources, you may only be able to do so 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) Figure 6 Analog Audio Digital Video The AVR 154 is equipped with three HDMI (High-Definition Multimedia Interface) inputs, and one output. HDMI is capable of carrying digital audio and video information using a single cable, thus delivering the highest possible quality picture and sound. The AVR 154 is capable of switching the HDMI data, passing the incoming audio and video data (including 1080i and 1080p video), directly to your HDMI-capable video display, without processing any of the data. Although the AVR 154 is compatible with virtually any HDMI-capable source device and video display, a separate audio connection is required for each source, since the AVR 154 doesn't have access to the audio data in the HDMI stream.

17 L R Multichannel analog connections are used with some high-definition sources where the copy-protected digital content is decoded inside 17 CONNECTIONS The AVR 154 will not convert analog video signals to the HDMI format, and the on-screen displays are not visible when using an HDMI source. Connect the composite or S-video monitor output (or both, depending on which video connections your sources use) to your video display to view the on-screen menus. The physical HDMI connection is simple. The connector is shaped for easy plug-in (see Figure 9). If your video display has a DVI input, you may use an HDMI-to-DVI adapter (not included) to connect it to the AVR's HDMI Output, but the HDMI-to-DVI connection will not carry audio.

In addition, your DVI-equipped display should be HDCP (HighDefinition Copy Protection)-compliant. Component video cable Figure 12 Component Video If it's available on your video display, HDMI is recommended as the best quality connection, followed by component video, S-video and then composite video.

NOTES: · A composite or S-video connection to your TV is required to view the AVR's on-screen displays. · Copy-protected sources are not available at the Component Video Monitor Outputs. Figure 9 HDMI Connection 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.

Composite video cable Figure 10 Composite Video Antennas The AVR 154 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. Figure 13 FM Antenna The AM loop antenna needs to be assembled. Then connect the two leads to the push-type terminals on the receiver. Although the terminals are color-coded, you may connect either antenna lead to either terminal. See Figure 14. 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 14 AM Antenna Figure 11 S-Video Component video separates the video signal into three components one luminance ("Y") and two subsampled color signals ("Pb" and "Pr") that are transmitted using three separate cables. The "Y" cable is color-coded green, the "Pb" cable is colored blue and the "Pr" cable is colored red. See Figure 12. 18 18 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. See Figure 15. The speakers should be angled so that they directly face the listening position. 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. 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. The surround speakers may be placed a little higher than the listener's ears. 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. You may wish to experiment over time by placing the subwoofer where the listener normally sits and then walking around the room until the low frequencies sound best. Place the subwoofer in that spot.

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. Video Display Center Front Left Speaker 30° 30° Subwoofer Front Right Speaker 110° 110° 150° 150° Surround Left Speaker Surround Right Speaker Alternate Placement for Surround Left Speaker Figure 15 Speaker Placement Alternate Placement for Surround Right Speaker 19 19 INSTALLATION You are now ready to connect your various components to your receiver. Before beginning, turn off all components, including the AVR 154, and unplug their power cords. Don't plug any of the power cords back in until you have finished making all of your connections. Remember that your receiver generates heat while it is on.



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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. Step Three Connect the Antennas Connect the FM and AM antennas to their terminals. See Figure 18. AVR 154 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 and surround right loudspeakers to the corresponding speaker terminals on the AVR 154. See Figure 16. 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 16 as a reference. FM AM Figure 18 Antenna Connections Step Four Connect the Source Components Use the Table A5 worksheet in the Appendix to note which connections you will use for each of your source devices. 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 154 remote control on page 13, there is a section of 12 buttons near the top of the remote designated "Input Selectors": DVD, AM/FM, CD, AUX, TAPE, VID1, VID2, VID3, HDMI1, HDMI2, HDMI3 and 6CH. Each of these buttons corresponds to a set of input connectors on the AVR. The set of connectors is referred to as a "source input". 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 154. We recommend that you refer to Table A1 in the appendix when making these connections. Although you may connect a source to any source input with the matching types of connectors, by selecting the source input dedicated to the same type of component, you will be able to program the AVR's universal remote to control it, simplifying operation. 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: AVR 154 C FR FL SR SL Figure 16 Speaker Connections Step Two Connect the Subwoofer Connect the Subwoofer Output on the AVR 154 to the line-level input on your subwoofer. See Figure 17. Consult the manufacturer's guide for the subwoofer for additional information. AVR 154 Audio Connections SUB Figure 17 Subwoofer Connection · Choose one digital audio connection: Optical or Coaxial · Optional, or where digital audio is not available: Analog audio for making recordings for personal use or as a backup. Analog audio is required for older analog sources that don't have digital audio outputs, such as cassette decks. 20 20 INSTALLATION Video Connections: (choose only one, and make sure that type is available on your TV) · HDMI · Component video · S-video · Composite video AVR 154 NOTES: · Digital audio, HDMI and component video connections are not dedicated to any source input. When any of these physical connections are used, they must be assigned to the desired source input as described in the Initial Setup section. It's possible for a source input to use none of the connectors named for it; e.g.

, the DVD source may use the Component Video 1 inputs for video and the Coaxial Digital Audio Input 1 for audio, both of which require assignment. · If the video display is equipped with an HDMI or DVI digital video input, make sure it is also HDCP-compliant (HighBandwith Digital Content Protection) to display copy-protected materials. · If the source or video display has a DVI input, use an HDMIto-DVI adapter (not included), and make separate audio connections. · Although the 6-Channel Analog Audio Inputs are designated as a separate source input, the 6CH button on the remote may not be programmed to operate a source device. The 6-Channel Analog Audio Inputs are used with an analog video input (component video, S-video or composite video, but not HDMI) that may also be assigned to another source input, such as DVD.

Program the corresponding Input Selector on the remote, e.g., DVD, with the device's product code. To enjoy audio from the 6-Channel Analog Audio Inputs, first select the source for the video input (DVD, in this example), and then switch the source to the 6-Channel Analog Audio Inputs. The AVR 154 will use the last-selected analog video input while obtaining audio from the 6-Channel Analog Audio Inputs.

Figure 19 Connecting an HDMI-Equipped Disc Player If the player is capable of playing multichannel discs, including DVDAudio, SACD, HD-DVD and Blu-ray Disc, make the following additional connections (see Figure 20): · Connect the DVD player's component video output to the Component Video 1 Input on the AVR. · Connect the DVD player's 6-channel analog audio outputs to the 6-Channel Analog Audio Inputs on the AVR. AVR 154 Figure 20 Connecting a Multichannel Audio Player Connect a DVD, SACD, HD-DVD or Blu-ray Disc Player HDMI Video: If the DVD player and the TV both have an HDMI connector, connect the player as follows (see Figure 19): · Connect the DVD player's HDMI output to the HDMI 1 Input on the AVR. · Connect the DVD player's coaxial digital audio output to the Coaxial 2 input on the AVR. Component Video: If the DVD player or the TV does not have an HDMI connector, but they both have component video connectors, connect the player as follows (see Figure 21): · Connect the DVD player's component video output to the Component Video 1 Input on the AVR. · Connect the DVD player's coaxial digital audio output to the Coaxial 1 input on the AVR. 21 INSTALLATION NOTES: · Where a given type of connection is called for, e.g., HDMI, component video or digital audio, you may use any available input of that type. We recommend connections solely because they are assigned by default to certain source inputs.

· If you wish to make recordings from a DVD, use the DVD S-video or composite video input, and the DVD Analog Audio inputs in addition to any other connections. The AVR cannot make recordings from HDMI or component video sources, and digital audio sources may only be recorded in two channels. · You may connect the DVD player to the Video 1, Video 2 or Video 3 source inputs, but you will then be unable to program the AVR remote to operate the player.



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· Connect a Harman Kardon DMC 1000 digital media center to any available HDMI Input for digital video and any available input for digital audio, or to the Video 1 Audio/Video Inputs for analog audio and video. You may make both the analog and digital audio and video connections, depending on your system requirements. AVR 154 Figure 21 Connecting a Component-Video-Equipped Disc Player If the player is capable of playing multichannel discs, including DVD-Audio, SACD, HD-DVD and Blu-ray Disc, make the following additional connection (see Figure 20): · Connect the DVD player's 6-channel analog audio outputs to the 6-Channel Analog Audio Inputs on the AVR. Composite/S-Video: If the best video connection common to both the DVD player and the TV is either S-video or composite video, follow these steps (see Figure 22): · Connect the DVD player's S-video or composite video output (use one connection only) to the corresponding DVD Video Input on the AVR. · Connect the DVD player's coaxial digital audio output to the Coaxial 1 input on the AVR. If the player is capable of playing multichannel discs, including DVD-Audio, SACD, HD-DVD and Blu-ray Disc, make the following additional connection (see Figure 22): · Connect the DVD player's 6-channel analog audio outputs to the 6-Channel Analog Audio Inputs on the AVR. Connect an Audio/Video Recorder (PVR, DVR or TiVo) HDMI Video: If the recorder and the TV both have an HDMI connector, connect the recorder as follows (see Figure 23): · Connect the recorder's HDMI output to the HDMI 2 Input on the AVR.

· Connect the recorder's optical digital audio output to the Optical 2 input on the AVR. · Then go to "Composite/S-Video" on page 23 to make recordings, as the AVR 154 cannot make recordings from digital audio (except 2-channel) and video sources. AVR 154 AVR 154 Figure 23 Connecting an HDMI-Equipped Recorder Figure 22 Connecting a Composite- or S-Video-Equipped Disc Player Component Video: If the recorder or the TV does not have an HDMI connector, but they both have component video connectors, connect the recorder as follows (see Figure 24): · Connect the recorder's component video output to the Component Video 2 Input on the AVR. 22 INSTALLATION · Connect the recorder's optical digital audio output to the Optical 2 Input on the AVR (if available). · Then go to "Composite/S-Video" below to make recordings, as the AVR 154 cannot make recordings from copy-protected component video sources or digital audio (except 2-channel) sources.

Connect a Cable TV, Satellite, HDTV or Other Set-Top Box for Broadcast Television NOTE: If you receive your television programming using your TV with an antenna or direct cable connection, connect the TV's analog audio outputs to the Video 3 Analog Audio Inputs. If the TV has a digital audio output, connect it to one of the frontpanel digital audio inputs. Do not connect any video output on the television set to any video input on the receiver. See Step Five for information on connecting the receiver's video monitor outputs to the television. AVR 154 HDMI Video: If the set-top box and the TV both have an HDMI connector, connect the set-top box as follows (see Figure 26): · Connect the set-top's HDMI output to the HDMI 3 Input on the AVR.

Figure 24 Connecting a Component-Video-Equipped Recorder · Connect the set-top's optical digital audio output to the Optical 1 Input on the AVR (if available). Composite/S-Video: If the best video connection common to both the recorder and the TV is either S-video or composite video, or to make recordings, follow these steps, using only one type of video connection throughout (see Figure 25): · Connect the recorder's S-video/composite video output to the Video 1 S-Video/Composite Video Input on the AVR. · Connect the recorder's S-video/composite video input to the Video 1 S-Video/Composite Video Output on the AVR. · Connect the recorder's analog audio outputs to the Video 1 Audio Inputs on the AVR. · Connect the recorder's analog audio inputs to the Video 1 Audio Outputs on the AVR. AVR 154 Figure 26 Connecting an HDMI-Equipped Set-Top Box Component Video: If the set-top box or the TV does not have an HDMI connector, but they both have component video connectors, connect the set-top box as follows (see Figure 27): · Connect the set-top's component video output to the Component Video 2 Input on the AVR (if available). AVR 154 · Connect the set-top's optical digital audio output to the Optical 1 Input on the AVR (if available). AVR 154 Figure 25 Connecting a Video Recorder NOTE: If S-video or composite video is the only video connection, you may also use any available digital audio connection. Figure 27 Connecting a Component-Video-Equipped Set-Top Box 23 INSTALLATION Composite/S-Video: If the best video connection common to both the set-top box and the TV is either S-video or composite video, follow these steps (see Figure 28): · Connect the set-top's S-video or composite video output (use one connection only) to the corresponding Video 2 Input on the AVR. · Connect the set-top's optical digital audio output to the Optical 1 Input on the AVR (if available).

For fully analog set-top boxes, connect the box's analog audio outputs to the AVR's Video 2 Audio Inputs. AVR 154 To make analog audio recordings, connect the recorder's left and right analog audio outputs to the Tape Inputs on the AVR, and the recorder's analog audio inputs to the AVR's Tape Outputs. No video connection is required, although the AVR will display the lastselected analog video source when the Tape source is selected. See Figure 30. AVR 154 Figure 30 Connecting an Audio Recorder Connect a Portable Audio Player For audio-only playback from a portable CD player, cassette deck, MP3 player or other device equipped with a 1/8-inch headphone jack, use a stereo 1/8-inch mini-plug interconnect (not included) to connect the device's headphone jack to the AUX Input on the AVR. Use the device's own controls to operate it. See Figure 31. Figure 28 Connecting a Set-Top Box Connect a CD Player or Any Audio-Only Device If the CD player or other component has a digital audio output, connect it to any available digital audio input on the AVR. If not, connect the CD player's left and right analog audio outputs to the CD Audio Inputs. No video connection is required, but the AVR will display the last-selected analog video source when the CD source is selected.

See Figure 29. AVR 154 Figure 31 Connecting a Portable Audio Player AVR 154 Alternatively, use an interconnect with a stereo 1/8-inch mini-plug at one end and two RCA plugs at the other end to connect the player to the Video 3 Audio Inputs on the AVR's front panel (see Figure 32).



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