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You can read the recommendations in the user guide, the technical guide or the installation guide for HARMAN KARDON AVR 156. You'll find the answers to all your questions on the HARMAN KARDON AVR 156 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 156

User guide HARMAN KARDON AVR 156

Operating instructions HARMAN KARDON AVR 156

Instructions for use HARMAN KARDON AVR 156

Instruction manual HARMAN KARDON AVR 156

AVR 156
Audio/video receiver

Owner's Manual



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Manual abstract:

If you have any questions about this product, its installation or its operation, please contact your Harman Kardon retailer or custom installer, or visit our Web site at www.harmankardon.com. Introduction, Supplied Accessories, Important Safety Information and Place the AVR IMPORTANT SAFETY INFORMATION Verify Line Voltage Before Use The AVR 156 has been designed for use with 220 240-volt alternating current (AC). Connection to a line voltage other than that for which your AVR is intended can create a safety and fire hazard, and may damage the unit. @@@@ We do not recommend that extension cords be used with this product. @@@@ If you do not intend to use your AVR for any considerable length of time, disconnect the plug from the AC outlet. Supplied Accessories The following accessory items are supplied with your AVR. If any of these items are missing, please contact your Harman Kardon dealer, or Harman Kardon customer service at www.harmankardon.com.

System remote control AM loop aerial FM wire aerial Three AAA batteries AC power cord 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 warranty. 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 authorised service centre. Place the AVR Place the AVR on a firm and level surface.

Be certain that the surface and any mounting hardware can support the AVR's weight. Provide proper space above and below the AVR for ventilation. If you install the AVR in a cabinet or other enclosed area, provide cooling air within the cabinet. Under some circumstances, a fan may be required. Do not obstruct the ventilation slots on the top of the AVR or place objects directly over them.

Do not place the AVR directly on a carpeted surface. Do not place the AVR in moist or humid locations, in extremely hot or cold locations, in areas near heaters or heat registers, or in direct sunlight. AVR 156 Front-Panel Controls Front-Panel Controls Power Indicator IR Sensor Set Button Message Display Surround Mode Select Buttons Volume Knob Power Button Channel Level Control Button Left/Right Buttons Up/Down Buttons/ Tuning Buttons Headphone Jack USB Port Aux Analogue Audio Input Connector Tuning Mode Button Digital Input Button Surround-Mode Category Button Source Select Buttons 4 AVR 156 Front-Panel Controls, continued Power indicator: This LED has three possible modes: LED is off: Indicates that the AVR is unplugged or the rear-panel Main Power switch is off. LED glows amber: Indicates that the AVR is in the Standby mode. LED glows white: Indicates that the AVR is turned on.

IMPORTANT NOTE: If the PROTECT message ever appears on the AVR's front-panel Message display, turn off the AVR and unplug it from the AC outlet.

Check all speaker wires for a possible short circuit (the "+" and "" conductors touching each other or both touching the same piece of metal). If a short circuit is not found, bring the unit to an authorised Harman Kardon service centre for inspection and repair before using it again. IR sensor: This sensor receives infrared (IR) commands from the remote control. It is important to ensure that the sensor is not blocked.

Set button: Press this button to select the currently highlighted menu item. 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 appears 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 current menu settings appear. Surround-Mode Select buttons: After you have selected the desired surround-mode category, press these buttons to select a specific mode within the category, such as to change from Dolby® Pro Logic® II Movie mode to Logic 7® Movie mode. Surround-mode availability depends on the nature of the source input signal, i.e., digital versus analogue, and the number of channels encoded within the signal. Volume knob: Turn this knob to raise or lower the volume. Front-Panel Controls, continued Power button: Press this button to turn the AVR on or to place it in the Standby mode.

Tuning Mode button: 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 in. Channel Level Control button: Press this button to activate the channel-level adjustment feature. After pressing this button, use the Up/Down buttons to select the channel for adjustment and use the Left/Right buttons to adjust the channel's level. Digital Input button: Press this button to change the audio input for the current source.

Use the Left/Right buttons to cycle through the available inputs. Although you can assign any digital audio input to any source, the analogue audio inputs are all permanently dedicated to the source with which they are labeled. Left/Right buttons: Use these buttons to navigate the AVR's menus. Up/Down buttons/Tuning buttons: Use these buttons to navigate the AVR's menus. When the radio is the active source, use these buttons to tune stations according to the setting of the Tuning Mode button (see above).

Surround-Mode Category button: Press this button to select a surround-sound category. Each press changes the surround-mode category: Auto Select, Virtual, Stereo, Movie, Music and Video Game. To change the specific surround-sound mode within the category, use the Surround Mode Select buttons. See Audio Processing and Surround Sound, on page 20, for more information on surround modes. Headphone jack: Connect a 1/4" stereo headphone plug to this jack for private listening. Source Select buttons: Press these buttons to select the active source. USB port: You can use this port to perform software upgrades that may be offered in the future. Do not connect a storage device, a peripheral product or a PC here, unless instructed to do so as part of an upgrade procedure. Aux Analogue Audio Input connector: Connect an auxiliary source component that will be used only temporarily, such as a camcorder, portable music player or game console, here. ENGLISH 5 AVR 156 Rear-Panel Connectors Composite Monitor Input Connector Video 2 Out Connector Rear-Panel Connectors HDMI® Monitor Out Connector DVD Component Video Input Connector Composite Video Input Connectors Radio Aerial Connectors HDMI Input Connectors Digital Audio Input Connectors Analogue Video Connectors Analogue Audio Input/Output Connectors Speaker Connectors Main Power Switch AC Input Connector Subwoofer Connector 12V Trigger Connector 6 AVR 156 Rear-Panel Connectors, continued Radio Aerial connectors: Connect the included AM and FM aerials to their respective terminals for radio reception.



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HDMI Monitor Out connector: If your TV has an HDMI connector and you have HDMI or component video source devices, use an HDMI cable (not included) to connect it to the AVR's HDMI Monitor Out connector. Notes on using the HDMI Monitor Out connector: When connecting a DVI-equipped display to the HDMI Monitor Out connector, use an HDMI-to-DVI adapter and make a separate audio connection. Make sure the HDMI-equipped display is HDCP-compliant. If it isn't, do not connect it via HDMI; use an analogue video connection instead and make a separate audio connection. **HDMI Input connectors:** The HDMI (High-Definition Multimedia Interface®) feature is a connection for transmitting digital audio and video signals between devices. If your source devices have HDMI connectors, using them will provide the best possible video and audio performance quality. Since the HDMI cable carries both digital video and digital audio signals, you do not have to make any additional audio connections for devices you connect via HDMI connections. See *Connect Your Source Devices*, on page 13, for more information. **Composite Video Monitor Out connector:** If your TV or video display does not have an HDMI connector, or if your TV does have an HDMI connector but you are connecting some source devices with only composite video connectors, use a composite video cable (not included) to connect the AVR's Composite Video Monitor Out connector to your TV's composite video input connector. **DVD Component Video Input connector:** If your Blu-ray Disc™ or DVD player does not have an HDMI connector but does have a component video connector, using the component video connector will provide superior video performance.

You will also need to make an audio connection from the player to the AVR. **Rear-Panel Connectors, continued Video 2 Out connector:** Connect an analogue video recorder's video input connector to the AVR's Video 2 Out connector. You can record any composite video input signal. **NOTE:** To record the audio and video from the source device, connect the AVR's Video 2 Out Analogue Output connectors to the analogue video recorder's audio inputs. **Composite Video Input connectors:** Use composite video connectors for video source devices that don't have HDMI or component video connectors.

You will also need to make an audio connection from the source device to the AVR. See *Connect Your Source Devices*, on page 13, for more information. **Subwoofer connector:** Connect this jack to a powtc. This action will also turn on the AVR and switch the remote's control mode to operate the selected source device. **NOTE:** The first press of the Radio Source Selector button switches the AVR to the last-used tuner band (AM or FM).

Each successive press changes the band. **Test Tone button:** Press this button to activate the test tone for calibrating channel volume levels by ear. **Sleep button/Channel Up/Down buttons:** Press the Sleep button to activate the sleep timer, which turns off the AVR after a programmed period of time of up to 90 minutes. The Channel Up/Down buttons have no effect on the AVR but are used to change channels on TVs and some video sources. **Volume Up/Down buttons:** Press these buttons to raise or lower the volume. **OSD button:** Press this button to activate the on-screen display menu system. **Channel Level Control button:** Press this button to activate the individual channel-level adjustment. It lets you easily change the channel balance to suit different programs or seating arrangements. See *Configure the AVR for Your Speakers*, on page 17, for more information. **Speaker Setup button:** Press this button to configure which speakers are included in your system.

See *Configure the AVR for Your Speakers*, on page 17, for more information. **OK button:** This button is used to select items from the menu system. **Digital Input button:** Press this button to select the specific digital audio input (or analogue audio input) to which the current source is connected. **Delay button:** Pressing this button lets you adjust two different types of delay settings (use the Up/Down buttons to cycle through the settings); **A/V Sync:** This setting lets you resynchronise the audio and video signals from a source to eliminate a "lip sync" problem. Lip-sync issues can occur when the video portion of a signal undergoes additional processing in either the source device or the video display. Use the Left/Right buttons to delay the audio by up to 180ms. **Front L/Centre/Front R/Surr R/Surr L/Subwoofer:** These settings let you set the delay for each speaker to compensate for the different distances they may be from the listening position. Use the Up/Down buttons to cycle through each of the system's speakers, and use the Left/Right buttons to set the distance each speaker is from the listening position. See *Configure the AVR for Your Speakers*, on page 17, for more information. **le box, satellite dish AVR, HDTV tuner or aerial connected to the TV); a TV or video display; and multiple loudspeakers.**

Multichannel Audio The main benefit of a home theatre system is its ability to produce "surround sound." Surround sound uses multiple speakers and amplifier channels to immerse you in the audio/video presentation for a dramatically increased sense of realism. Your AVR can have up to five main speakers connected directly to it, plus a subwoofer. Each main speaker is powered by its own amplifier channel inside the AVR. A system with more than two speakers is called a multichannel system.

The different main speaker types in a home theatre system are: **Front Left and Right:** The front left and right speakers are used as in a 2-channel system. In many surround-sound modes, these speakers are secondary, while the main action, especially dialogue, is reproduced by the centre speaker. **Centre:** When you are watching movies and television programs, the centre speaker reproduces most of the dialogue and other soundtrack information that occurs on the screen, anchoring it with the picture. When you are listening to a musical program, the centre speaker helps to create a seamless front soundstage, creating a more realistic "you-are-there" listening experience. **Surround Left and Right:** The surround left and right speakers produce ambient sounds that help create a realistic and immersive surround-sound environment.

They also help recreate directional sound effects such as aircraft flyovers. Many people expect the surround speakers to play as loudly as the front speakers. Although you will calibrate all of the speakers in your system to sound equally loud at the listening position, most artists use the surround speakers for ambient effects only, and they create their programs to steer relatively little sound to these speakers. **Subwoofer:** A subwoofer is designed to play only the lowest frequencies (the deep bass). It augments smaller, limited-range main speakers that are usually used for the other channels. Many digital-format programs, such as movies recorded in Dolby Digital, contain a low-frequency effects (LFE) channel that is directed to the subwoofer.



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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 theatre. Some people use two subwoofers for additional power and for even distribution of the sound. **SL SR Placing the Left, Centre and Right Speakers** Place the centre speaker either on top of, below or mounted on the wall above or below the TV or video-display screen. Place the front left and right speakers along the circle, about 30 degrees from the centre speaker and angled toward the listener.

Place the front left, front right and centre speakers at the same height, preferably at about the same height as the listener's ears. The centre speaker should be no more than 2 feet (0.6m) above or below the left/right speakers. If you're using only two speakers with your AVR, place them in the front left and front right positions. **Placing the Surround Speakers** You should place the left and right surround speakers approximately 110 degrees from the centre speaker, slightly behind and angled toward the listener. Alternatively, you can place them behind the listener, with each surround speaker facing the opposite-side front speaker. You should place the surround speakers 2 feet 6 feet (0.6m 1.8m) higher than the listener's ears. **NOTE:** Your AVR will sound its best when the same model or brand of loudspeaker is used for all positions.

Surround Modes There are different theories as to the best way to present surround sound and to distribute the individual channel information to the surround-system's speakers. A variety of algorithms have been developed in an effort to recreate the way we hear sounds in the real world, resulting in a rich variety of options. Several companies have developed different surround-sound technologies, all of which can be accurately reproduced by your AVR: **Dolby Laboratories:** Dolby TrueHD, Dolby Digital Plus, Dolby Digital, Dolby Digital EX, Dolby Pro Logic II. **DTS:** DTS-HD High Resolution Audio, DTS-HD Master AudioTM, DTS, DTS 96/24TM. **HARMAN International:** Logic 7, HARMAN virtual speaker, HARMAN headphone.

Stereo Modes: 2-channel stereo and 5-channel stereo. Appendix Table A9, on page 30, contains detailed explanations of the different surroundsound options available on your AVR. Digital surround-sound modes, such as Dolby Digital and DTS systems, are available only with specially encoded programs, such as those available via HDTV, DVD and Blu-ray Disc media and digital cable or satellite television. Other surround modes may be used with digital and analogue signals to create a different surround presentation or to use a different number of speakers. Surroundmode selection depends upon the number of speakers in your system, the programs you are watching or listening to, and your personal tastes.

Placing the Subwoofer Because a room's shape and volume can have a dramatic effect on a subwoofer's performance, it is best to experiment with placement so that you will find the location that produces the best results in your particular listening room. With that in mind, these rules will help you get started:

Placing the subwoofer next to a wall generally will increase the amount of bass in the room. Placing the subwoofer in a corner generally will maximise the amount of bass in the room. In many rooms, placing the subwoofer along the same plane as the left and right speakers can produce the best integration between the sound of the subwoofer and that of the left and right speakers. In some rooms, the best performance could even result from placing the subwoofer behind the listening position. A good way to determine the best location for the subwoofer is by temporarily placing it in the listening position and playing music with strong bass content. Move around to various locations in the room while the system is playing (putting your ears where the subwoofer would be placed), and listen until you find the location where the bass performance is best. Place the subwoofer in that location. **10 AVR 156 Types of Home Theatre**

System Connections There are different types of audio and video connections used to connect the AVR to your speakers, your TV or video display, and your source devices. The Consumer Electronics Association has established the CEA® colour-coding standard.

Connection Colour Guide Table Types of Home Theatre System Connections Subwoofer Connections The subwoofer is a speaker dedicated to reproducing only the low (bass) frequencies, which require more power. To obtain the best results, most speaker manufacturers offer powered subwoofers that contain their own amplifiers. Use a single RCA audio cable (not included) to make a line-level (non-amplified) connection from the AVR's Subwoofer connector to a corresponding input jack on the subwoofer. **ENGLISH Analogue Audio Connection Front Left/Right Centre Surround Left/Right Subwoofer Colour White/Red**

Green Blue/Gray Purple Although the AVR's purple subwoofer output looks similar to a full-range analogue audio jack, it is filtered so that only the low frequencies pass through it. Don't connect this output to any device other than a subwoofer. **Digital Audio Connection Coaxial (input or output) Optical Input Colour Orange Black Source Device Connections** Audio and video signals originate in source devices (components where a playback signal originates) such as your Blu-ray Disc or DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television tuner or MP3 player. The AVR's FM/AM tuner also counts as a source, even though no external connectors are needed other than the AVR's FM and AM aerials. Separate connectors are required for the audio and video portions of the source device's signal, except for digital HDMI connectors. The types of connectors you use will depend upon the capabilities of the source device and of your TV or video display. **Digital Audio Connections HDMI** There are two types of audio connections digital and analogue.

Digital audio signals are required for listening to sources encoded with digital surround modes, such as Dolby Digital and DTS, or for uncompressed PCM digital audio. Your AVR has three types of digital audio connectors: HDMI, coaxial and optical. Do not use more than one type of digital audio connector for each source device. However, it's okay to make both analogue and digital audio connections to the same source. Your AVR is equipped with four rear-panel HDMI input connectors and one HDMI monitor output connector.

HDMI technology enables digital audio and video information to be carried using a single cable, delivering the highest quality picture and sound. If your TV or video-display device has an HDMI input connector, make a single HDMI connection from each source device to the AVR. Usually, a separate digital audio connection is not required. The HDMI connector is shaped for easy plug-in (see illustration, below), and HDMI cable runs are limited to about 10 feet (3m).



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If your video display has a DVI input and is HDCP-compliant, use an HDMI-to-DVI adapter (not included), and make a separate audio connection. Analogue Video Connection Component Video Composite Video Colour Red/Green/Blue Yellow Speaker Connections Speaker cables carry an amplified signal from the AVR's speaker terminals to each loudspeaker. Each cable contains two wire conductors, or leads, that are differentiated in some way, such as with colours or stripes. The differentiation helps you maintain proper polarity, without which your system's low-frequency performance can suffer. Each speaker is connected to the AVR's speaker output terminals using two wires, one positive (+) and one negative (-). Always connect the positive terminal on the speaker, which is usually coloured red, to the positive terminal on the AVR, which is coloured as indicated in the Connection Colour Guide Table, above. The negative terminals on the speakers and the AVR are black. Your AVR uses binding-post speaker terminals that can accept bare-wire cables or banana plugs. Bare-wire cables are installed as shown below: 1. Unscrew Cap 2. Insert Bare Wire 3.

Tighten Cap Banana plugs are inserted into the hole in the middle of the terminal cap, as shown below: A. Tighten Cap B. Insert Banana Connector into Hole in Cap Digital Audio Connections Coaxial Coaxial digital audio jacks are usually colour-coded orange. Although they look like standard RCA-type analogue jacks, you should not connect coaxial digital audio outputs to analogue inputs or vice versa. Always connect the coloured (+) terminal on the AVR to the (+) terminal on the speaker (usually red), and the black (-) terminal on the AVR to the (-) terminal on the speaker (usually black). IMPORTANT: Make sure the (+) and (-) bare wires do not touch each other or the other terminal. Touching wires can cause a short circuit that can damage your AVR or amplifier. 11 AVR 156 Digital Audio Connections Optical Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted. Types of Home Theatre System Connections, continued Analogue Video Connections Component Video Component video separates the video signal into three components one luminance ("Y") and two sub-sampled colour signals ("Pb" and "Pr") that are transmitted using three separate cables that are colour-coded green (Y), blue (Pb) and red (Pr).

Component video cables that join three separate green, blue and red connectors into a single cable are sold separately. Analogue Audio Connections Two-channel analogue connections require a stereo audio cable, with one connector for the left channel (white) and one for the right channel (red). These two connectors are attached to each other. If your TV or video display has an HDMI connector, we recommend it for the best quality connection. Your AVR converts component analogue video input signals to the HDMI format, upscaling them to high-definition 1080p resolution.

Radio Connections For source devices that have both digital and analogue audio outputs, you may make both connections. The analogue connections also feed the Analogue Record Output connectors. You may record materials from Blu-ray Disc recordings, DVDs or other copy-protected sources using only analogue connections. Remember to comply with all copyright laws if you choose to make a copy for your own personal use. Your AVR uses separate terminals for the included FM and AM aerials.

The FM aerial uses a 75-ohm F-connector. Video Connections Many source devices output both audio and video signals (e.g., Blu-ray Disc, DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to an audio connection as described above, make a video connection for each of these source devices. Make only one type of video connection for each device. Digital Video Connections If you have already connected a source device to one of the AVR's HDMI input connectors, you have automatically made a video connection for that device, since the HDMI cable carries both digital audio and digital video signals. Analogue Video Connections Composite Video Your AVR uses two types of analogue video connections: composite video and component video. Composite video is the basic connection most commonly available. Both the chrominance (colour) and the luminance (intensity) components of the video signal are transmitted using a single cable.

The jack is usually colour-coded yellow and looks like an analogue audio jack. Do not connect a composite video jack to an analogue audio or coaxial digital audio jack, or vice versa. The AM aerial connector uses spring-clip terminals. After assembling the aerial as shown below, press the levers to open the connectors, insert the bare wires into the openings, and release the levers to secure the wires. The aerial wires are not polarised, so you can insert either wire into either connector. USB Port The USB port on your AVR is used for firmware upgrades. If an upgrade for the AVR's operating system is released in the future, you will be able to download it to the AVR using this port. Complete instructions will be provided at that time. IMPORTANT: Do not connect a PC or other USB host/controller to the AVR's USB port, or you may damage both the AVR and the other device. 12 AVR 156 Making Connections CAUTION:

Before making any connections to the AVR, ensure that the AVR's AC cord is unplugged from the AVR and the AC outlet.

Making connections with the AVR plugged in and turned on could damage the speakers. Making Connections Connect Your TV or Video Display If your TV has an HDMI connector and you have HDMI or component video source devices, use an HDMI cable (not included) to connect your TV to the AVR's HDMI Monitor Out connector. It will provide the best possible picture quality. AVR HDMI Monitor Out Connector HDMI Cable (not supplied) Composite Video Monitor Out connector If your TV does not have an HDMI connector, or if your TV does have an HDMI connector but you are connecting some source devices with only composite video connectors, use a composite video cable (not included) to connect the AVR's Composite Monitor Out connector to your TV's composite video connector. AVR Composite Monitor Out Connector TV TV ENGLISH HDMI Monitor Out connector Connect Your Speakers After you have placed your loudspeakers in the room as explained in Place Your Speakers, on page 10, connect each speaker to its colour-coded terminal on the AVR as explained in Speaker Connections, on page 11.

Connect the speakers as shown in the illustration. C FL FR Composite Video Cable (not supplied) Connect Your Source Devices Source devices are components where a playback signal originates, such as a Blu-ray Disc or DVD player, or a cable, satellite or HDTV tuner. Your AVR has several different types of input connectors for your audio and video source devices: HDMI, component video, composite video, optical digital audio, coaxial digital audio and analogue audio.



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The connectors are labeled for the types of source devices you are most likely to connect. SL SR Each of your AVR's source buttons is assigned to an HDMI connector or an analogue audio input connector (listed in the "AVR Source Button/Analogue Audio Connector" column of the table below). To provide you flexibility for connecting and configuring your system, we have designed the AVR so that you can assign the digital audio inputs to any of the video AVR sources. As you connect your various source components, fill out the "Source Device Connected" column in the following table it will make it easier for you to assign the digital audio input connectors and component video connector later in the setup process. AVR Source Button/ Analogue Audio Connector Video 1 Video 2 DVD CD Tape Aux AVR Source Button/ HDMI Connector HDMI 1 HDMI 2 HDMI 3 Recommended Source Device Type Cable or Satellite Tuner DVD Recorder or VCR Blu-ray Disc or DVD Player CD Player Cassette Deck or Audio Recorder Portable Media Palyer _____

_____ Source Device Connected Digital Audio Input Connector Assigned Source Device Connected Digital Audio Input Connector Assigned Connect Your Subwoofer Use a single RCA audio cable to connect the AVR's Subwoofer Pre-Out connector to your subwoofer. Consult your subwoofer's user manual for specific information about making connections to it. AVR Subwoofer Pre-Out Connector Single RCA Audio Cable (not supplied) Powered Subwoofer Input Connections and Source Buttons 13 AVR 156 HDMI devices If any of your source devices have HDMI connectors, using those connectors will provide the best possible video and audio performance quality. Since the HDMI cable carries both digital video and digital audio signals, you do not have to make any additional audio connections for devices you connect via HDMI cables, although you can assign one of the digital audio connectors to one of the HDMI inputs. AVR HDMI Connectors Optical digital audio devices Making Connections, continued If your source devices have optical digital outputs, connect them to the AVR's Optical Digital Audio connectors. NOTE: Make only one type of digital connection (HDMI, optical or coaxial) from each device. AVR Digital Audio Connectors Optical Digital Audio Cable (not supplied) HDMI Cable (not supplied) To HDMI Output Coaxial digital audio devices HDMI-Equipped Source Device Component video devices If your Blu-ray Disc or DVD player does not have an HDMI connector but does have a component video connector, using the component video connector will provide superior video performance. You will also need to make an audio connection from the player to the AVR.

AVR DVD Component Video Connectors Coaxial Digital Audio Cable (not supplied) To Optical Digital Audio Output Optical Digital-Equipped Source Device If your source devices have coaxial digital outputs, connect them to the AVR's Coaxial Digital Audio connectors. NOTE: Make only one type of digital connection (HDMI, optical or coaxial) from each device. AVR Digital Audio Connectors To Coaxial Digital Output Component Video Cable (not supplied) To Component Video Outputs Analogue audio devices Make analogue audio connections from your source devices that do not have HDMI or digital audio connectors. If you're connecting video sources to the DVD, Video 1 or Video 2 audio inputs, you must also connect the source device's composite video output to the corresponding composite video connector. AVR Analogue Audio Connectors Coaxial Digital-Equipped Source Device Component Video-Equipped Blu-ray Disc or DVD Player Composite video devices You will need to make composite video connections from your source devices that do not have HDMI or component video connectors. You will also need to connect the source device's analogue audio outputs to the AVR's corresponding analogue audio connectors. IMPORTANT: If you connected your Blu-ray Disc or DVD player to the AVR's DVD Component Video Input connectors, do not connect a source device to the AVR's DVD Composite Video Input connector. AVR Composite Video Connectors Stereo Audio Cable (not supplied) Composite Video Cable (not supplied) To Stereo Analogue Audio Output To Composite Video Output Analogue Source Device Composite Video-Equipped Source Device 14 AVR 156 Audio recorders Connect an analogue audio recorder's inputs to the AVR's analogue audio Tape Out connectors. You can record any analogue audio input signal. AVR Analogue Audio Recorder Connectors Making Connections, continued, and Set Up the Remote Control Connect the 12V Trigger Output If your system has equipment that can be controlled by a DC trigger signal, connect it to the AVR's 12V Trigger connector with a mono 1/8-inch (3.5mm) mini-plug interconnect cable. The AVR will supply a 12V DC (100mA) trigger signal at this connection whenever it is powered on. AVR Mono 1/8-inch (3.5mm) Mini-Plug Interconnect (not supplied) ENGLISH Stereo Audio Cable (not supplied) To Stereo Analogue Record Inputs Device with Trigger in Connector Analogue Recording Device Video recorders Connect an analogue video recorder's video input connector to the AVR's Video 2 Out Composite Video connector, and its audio input connectors to the AVR's Video 2 Out Analogue Audio connectors. You can record any composite video signal. AVR Analogue Video Connectors Connect to AC Power Connect the AC power cord to the AVR's AC Input connector and then to a working AC power outlet. AVR AC Input Connector AC Power Outlet Power Cord (supplied) AVR Analogue Audio Connectors Analogue Audio/Video Cable (not supplied) To Analogue Audio/ Video Record Inputs Analogue Video Recording Device Connect the Radio Aerials Connect the supplied FM aerial to the AVR's FM 75 Radio Aerial connector. For the best reception, extend the FM aerial as far as possible. Bend and fold the base of the supplied AM aerial as shown and connect the aerial wires to the AVR's AM and Gnd connectors. (You can connect either wire to either connector.) Rotate the aerial as necessary to minimise background noise. AVR Radio Aerial Connectors FM Aerial (supplied) Set Up the Remote Control Install the Batteries in the Remote Control Remove the remote control's battery cover, insert the three supplied AAA batteries as shown in the illustration, and replace the battery cover. AM Aerial (supplied) Bend and fold base NOTE: Remove the protective plastic from the AVR's front panel to keep it from reducing the remote control's effectiveness. 15 AVR 156 Program the Remote to Control Your Source Devices and TV In addition to using the remote to control the AVR itself and the AM/FM radio, you can program the remote to control up to eight additional audio/video source devices plus your TV. Once you have programmed the remote, you can switch the remote's control mode to access the functions for a particular source device by pressing the remote's Source Selector button for that device.



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To control the AVR, press the remote's AVR button. Before you begin programming the remote, review the connections you filled in on the Input Connections and Source Buttons table on page 13. The Source Selector buttons are assigned to the components that you listed in the table's "Source Device Connected" column. 1. Turn on the source device you want to program the remote to control.

2. Look up the code numbers for the device in Tables A11 A17 in the Appendix. Write all the applicable code numbers in a convenient place. 3. Press and hold the Source Selector button for that source device until the Program Indicator LED on the remote starts to flash, then release it. (This procedure places the remote in the Programming mode.) NOTE: If you're programming one of the four HDMI source buttons, after pressing the HDMI button you must also press the Source Selector button for the type of device that will be controlled: Press DVD to control a DVD player. Press VID1 to control a VCR, DVR or Harman Kardon digital media centre. Press VID2 to control a cable or satellite set-top box. 4.

Aim the remote at the source device and use the remote's Number buttons to enter a code number from Step 2, above. a) If the device turns off, press the Source Selector button again to save its code. The Source Selector button will flash, and the remote will exit the Programming mode. b) If the device does not turn off, enter another code number. c) If you run out of code numbers for a device, you can search through all of the codes in the remote's library for devices of its type by pressing the Up or Down button repeatedly until the device turns off.

When it does, press the Source Selector button to save the code. 5. Check that other functions control the device correctly. Sometimes manufacturers use the same Power code for several models, while other function codes vary. Repeat this process until you've programmed a satisfactory code set that operates most of the device's functions.

6. If you searched through the remote's code library to find the code, you can find out which code number you have programmed by pressing and holding the Source Selector button to re-enter the Programming Mode. Then press the remote's OK button, and the Program Indicator LED will flash in the code sequence. One flash represents "1," two flashes represent "2," and so forth. A series of quick flashes represents "0." Record the code number programmed for each device in Table A7 in the Appendix. Repeat Steps 3 6 for each source device you want to control with the AVR remote. In general, the label for each button on the remote describes the button's function when used to control the AVR. However, the button may perform a very different function when used to control another device. Refer to the Remote Control Function List, Table A10 in the Appendix, for each button's functions with the various product types.

You can also program the remote to perform Macros (preprogrammed code sequences that execute many code commands with a single button press) and "punch-through" programming (allowing the remote to operate a device's channel or transport controls when the remote is in another device's mode). See Advanced Remote Control Programming, on page 22, for instructions on these functions. Set Up the Remote Control, continued, and Set Up the AVR Set Up the AVR Turn On the AVR 1. Set the rear-panel Main Power switch to "On." (The front-panel Power indicator will glow amber.) 2. Press the front-panel Power button. Main Power Switch Power Button Unless you will not be using the AVR for an extended period of time, leave the Main Power switch set to "On." When the Main Power switch is turned off, any settings you have programmed will be preserved for up to four weeks. IMPORTANT NOTE: If the PROTECT message ever appears in the Message display, turn off the AVR and unplug it.

Check all speaker wires for a short circuit ("+" and "-" wires touching). @@To access the menu system, press the OSD button on the remote.

@@@@@To exit the menu system, press the OSD button. @@@@For the subwoofer, write down the transducer size. @@@@The highest notes may not be heard at all through the subwoofer.

@@@@@NOTE: The AVR will let you adjust settings only for those speaker groups you set to On in the Number of Speakers menu. For each speaker group, select one of these eight crossover frequencies: LARGE, 40Hz, 60Hz, 80Hz, 100Hz, 120Hz, 150Hz or 200Hz. If the speaker's crossover frequency is below 40Hz, select the first option, LARGE. This setting doesn't refer to the speaker's physical size but to its frequency response, which is also called "full range." Specify the size of the subwoofer's transducer as 8, 10, 12 or 15 inches.

The AVR always sets the subwoofer crossover to 100Hz but uses the transducer size for equalisation. Write down the settings in Table A6 in the Appendix.

@@Sub Mode After you return to the Speaker Setup menu, navigate to the Sub Mode line and press the OK button to display the Sub Mode menu. This setting depends upon the Crossover setting you selected for the front left and right speakers. If you set the front speakers to a numeric crossover frequency, the subwoofer setting will always be SUB. All low-frequency information will always be sent to the subwoofer. If you don't have a subwoofer, either upgrade to full-range front left and right speakers or add a subwoofer at the earliest opportunity. If you set the front speakers to LARGE, select one of the three following settings for the subwoofer: L/R+LFE: This setting sends all low-frequency information to the subwoofer, including a) information that would normally be played through the front left and right speakers and b) the special low-frequency effects (LFE) channel information. OFF: Select this setting when no subwoofer is in use. All low-frequency information will be sent to the front left and right speakers.

LFE: This setting plays low-frequency information contained in the left and right program channels through the front left and right speakers, and directs only the LFE channel information to the subwoofer. @@Set the Speaker Distances As described above in Step Two, when you measured the distances from each of your speakers to the listening position, your AVR provides an adjustment that compensates for the different distances so that the sound from each speaker will reach the listening position at the proper time. This process will improve the clarity and detail of the sound. NOTE: All of the speaker setup submenus include a "Back to..." option. To save the current settings, select the Back to...

option. For best results, adjust the submenus in this order: Number of Speakers, Crossover, Sub Mode, Distance and Level Adjust. Number of Speakers This selection lets you program the correct setting for each speaker group.



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The settings in this menu affect the remainder of the speaker-setup process and the availability of various surround modes at any time. 17 ENGLISH Select ON when the speakers are present in the system; select OFF for positions where no speakers are installed.

The Front Left & Right setting is always ON and may not be disabled. AVR 156 After you return to the Speaker Setup menu, navigate to the Distance line and press the OK button to display the Distance menu. * DISTANCE * FL CEN FR SR : : : 10FT 10FT 10FT 10FT SL : 10FT SUB : 10FT Set Up the AVR, continued Channel Reset: To reset all channel levels to their factory defaults of 0dB, select this line and press the Left/Right buttons. When you have finished adjusting the speaker levels, record the settings in Table A6 in the Appendix. Then select the Back to Speaker Setup option in the OSD.

Notes on Setting Speaker Volumes in Home Theatre Systems: While setting your system's individual speaker volume levels is ultimately up to your personal taste, here are some ideas you may find helpful: For films and video-music programs, your overall goal should be to create an enveloping, realistic sound field that draws you into the film or music program without drawing your attention away from the action on the screen.

@@@@@@@@@@@@@@@@@@@@ You can enter distances between 0 and 30 feet (9.1m). The default distance for all speakers is 10 feet (3m). The default unit of measurement is feet. @@@@@@ In a home theatre system with up to seven main channels plus a subwoofer, achieving proper imaging becomes both more critical and more complex. The goal is to ensure that each channel is heard at the listening position with equal loudness (when signals of equal loudness are played through them). After you return to the Speaker Setup menu, navigate to the Level Adjust line and press the OK button to display the Level Adjust menu. * LEVEL ADJUST * FL : CEN: FR : SR : 0dB 0dB 0dB 0dB SL : 0dB SUB: 0dB Assign the Digital Audio Connectors 1. Review the input connections you listed on the Input Connections and Source Buttons table, on page 13.

Note which source devices you connected to the digital audio connectors. (If you did not connect any source devices to the digital audio connectors, you can skip this section.) 2. Turn on your TV and select the TV input where you connected the AVR in Connect Your TV or Video Display, on page 13. 3. Press the remote control's OSD button. The AVR's on-screen display (OSD) Master Menu will appear on the TV. CHANNEL RESET: OFF TEST TONE SEQ: MANUAL TEST TONE : OFF BACK TO SPEAKER SETUP All of the system's speakers will appear with their current level settings. You can adjust each speaker's level between 10dB and +10dB in 1dB increments. While making adjustments, you can measure the channel levels in one of these ways: Preferably, use a handheld SPL metre set to the C-weighting, slow scale.

Adjust each speaker so that the metre reads 75dB when the AVR's built-in test noise is playing. By ear. Adjust the levels so that the test tone sounds equally loud to you when it plays through each speaker. To set your levels using the AVR's internal test tone, select the menu's Test Tone Seq line and use the Left/Right buttons to select between Auto and Manual. After selecting Auto or Manual, move the cursor to the Test Tone line and use the Left/Right buttons to change the setting to On.

Auto: The test tone will automatically circulate to all speakers, as indicated by the highlight bar. Use the Left/Right buttons to adjust the level for any speaker when the test tone is paused there. Use the Up/Down buttons to move the cursor to another line, and the test tone will follow the cursor. To stop the test tone, use the Up/Down buttons to move the cursor out of the screen's speaker-listings area. Manual: The test tone will stay on the current speaker until you use the Up/Down buttons to move it to another speaker.

Use the Left/Right buttons to adjust the level for the speaker through which the test tone is playing. If you are using an external source to set your output levels, set Test Tone to Off, use the Up/Down buttons to navigate to each speaker, and use the Left/Right buttons to adjust the speaker's level while the source plays. NOTE: If you are using a handheld SPL metre with external source material, such as a test disc or an audio selection, play it and adjust the AVR's master volume control until the metre measures 75dB. Then adjust the individual speaker levels. ** MASTER MENU ** INPUT SETUP SURROUND SELECT SPEAKER SETUP SYSTEM SETUP 4. Use the remote's arrow and OK buttons to select "Input Setup." The Input Setup menu will appear. * INPUT SETUP * SOURCE : TITLE: AUDIO IN : AUTO POLL : BXR : TONE : BASS : TREBLE : DVD ANALOG OFF OFF IN 0 0 BACK TO MASTER MENU 18 AVR 156 5. For each source device you connected to a digital audio input: a) Use the remote's Up and Down arrow buttons to select "Source." Use the Left and Right arrow buttons to change the listed source to one of the sources you connected to a digital audio input connector.

b) Use the remote's down arrow button to select "Audio In." Set Up the AVR, continued, and Operating Your AVR Operating Your AVR Now that you have installed your components and completed a basic configuration, you are ready to begin enjoying your home theatre system. ENGLISH Controlling the Volume Adjust the volume either by turning the front-panel Volume knob (clockwise to increase volume or counterclockwise to decrease volume) or by pressing the Volume Up/Down buttons on the remote. The volume is displayed as a negative number of decibels (dB) below the 0dB reference point. 0dB is the maximum recommended volume for your AVR. Although it's possible to turn the volume to a higher level, doing so may damage your hearing and your speakers. For certain more dynamic audio materials, even 0dB may be too high, allowing for damage to equipment. Use caution with regard to volume levels. * INPUT SETUP * SOURCE : TITLE: AUDIO IN : AUTO POLL : BXR : TONE : BASS : TREBLE : DVD OPT 1 ON OFF IN 0 0 Muting the Sound To mute all speakers and the headphones, press the Mute button on the remote. Any recording in progress will not be affected.

The MUTE message will appear in the frontpanel display as a reminder. To restore the sound, press the Mute button again, or adjust the volume. BACK TO MASTER MENU c) Use the remote's Left and Right arrow buttons to select the digital audio input where you connected the source device. Additional Input Setup Menu Items You can also adjust the following settings independently for each source: Title: You may change the display name for any source (except the radio). This feature may help you to select the correct source device even when you have forgotten which physical connections you used.

1. Move the cursor to the Title line and press the OK button.



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A block cursor will blink. 2. Use the Up/Down buttons to scroll through the alphabet in upper and lower case, the numbers and many punctuation marks. When you have selected the desired character, press the Right button to move to the next space. Press the Right button twice to leave a blank space. 3. Press the OK button when you have finished. Auto Poll: The Auto Poll feature is used when both an analogue audio and a digital audio connection have been made for one source device. If no digital signal is available, the AVR will automatically switch to the analogue input for the source. This situation can occur with some cable or satellite television broadcasts, where some channels are broadcast with digital audio and others with analogue audio, or when a DVD player is paused or stopped. For some sources such as DVD players, the Auto Poll feature is unnecessary and may be undesirable. To turn Auto Poll off, move the cursor to the Auto Poll line and press the Left/ Right buttons until Off appears. With Auto Poll turned off, the AVR will check for a signal only at the audio input assigned to the source.

The remaining Input Setup menu items adjust the AVR's audio performance for that source and may be skipped at this time. For most listening, we recommend leaving these settings at their factory defaults, allowing you to enjoy the sound mix created by your favourite movie and music artists. BXR: Enhances bass performance when playing MP3 tracks. Select On, or leave it at the default Off setting for non-MP3 audio sources. Tone: This setting determines whether the treble and bass controls are active. When this line is set to Off, the tone controls are out of the circuit, with no changes to the sound. When this line is set to On, the bass and treble frequencies are boosted or cut, depending upon the Bass and Treble settings (see below). Bass and Treble: Boost or cut the low or high frequencies by up to 10dB by using the Left/Right buttons to change the setting by 2dB at a time. When you're finished, press the remote's OSD button to turn off the on-screen menu. Listening Through Headphones Plug the 1/4-inch stereo plug on a pair of headphones into the front-panel Phones jack for private listening.

The default Headphone Bypass mode delivers a conventional 2-channel signal to the headphones. Press the Surround Modes button on the front panel or use the remote and OSD to switch to HARMAN headphone virtual surround processing, which emulates a 5.1-channel speaker system. No other surround modes are available for the headphones. Selecting a Source There are two different ways to select a source: Press the front-panel Source Select buttons.

Directly select any source by pressing its Source Selector button on the remote. The AVR selects the audio and video inputs assigned to the source and any other settings you made during setup. The source name, the audio and video inputs assigned to the source, and the surround mode will appear on the front panel. Video Troubleshooting Tips If there is no picture: Check the source selection. Check all connections for a loose or incorrect connection.

Check the video-input selection on the TV/display device. Additional Tips for Troubleshooting HDMI Connections Turn off all devices (including the TV, the AVR and any source components). Unplug the HDMI cables, starting with the cable between the AVR and the TV, and continuing with the cables between the AVR and each source device. Carefully reconnect the cables from the source devices to the AVR. Connect the cable from the AVR to the TV last. Turn on the devices in this order: TV, AVR, source devices. NOTE: Depending upon the particular components involved, the complexity of the required communication between HDMI components may cause delays of up to a minute in the completion of some actions, such as input switching or switching between SD and HD channels. 19 AVR 156 Listening to FM and AM Radio Select the AM/FM source. Use the Tuning Up/Down buttons to tune a station, which will be shown on the front-panel display and the TV screen. The AVR defaults to automatic tuning, meaning each press of the Tuning Up/Down buttons scans until a station with acceptable signal strength is found.

To switch to manual tuning, in which each press of a Tuning button steps through a single frequency increment, press the Tuning Mode button. Each press of the Tuning Mode button toggles between the automatic and manual tuning modes. Once you have tuned an FM station, toggling the Tuning Mode setting also switches the radio between stereo and monaural reception. (Mono reception may improve reception of weaker stations.) Preset Stations A total of 30 stations (AM and FM combined) may be stored as presets. When the desired station has been tuned in, press the Memory button on the remote, and two dashes will flash on the front-panel Message display. Use the Number buttons to enter the desired preset number. To tune a preset station, press the Preset Up/Down buttons or enter the preset number using the Number buttons. Operating Your AVR, continued, and Advanced Functions Movie: Select from the following when you want a surround mode for movie playback: Logic 7 Movie or Dolby Pro Logic II Movie. Music: Select from the following when you want a surround mode for music playback: Logic 7 Music or Dolby Pro Logic II Music.

The Dolby Pro Logic II Music mode provides some additional settings. See Audio Processing and Surround Sound, on this page, for more information. Video Game: Select from the following when you want a surround mode for game playback: Logic 7 Game or Dolby Pro Logic II Game. After you select the surround-mode category, the Mode menu will appear: * MODE : MUSIC * DOLBY PLII MUSIC CENTER WIDTH : 3 DIMENSION : 0 PANORAMA : Off BACK TO MASTER MENU Use the Left/Right buttons to change the surround mode. You can also select surround modes using the AVR's front-panel buttons:

1. Press the Surr Mode button. The Message display will show the surround-mode category and surround mode. 2. To change the surround mode within the surround-mode category, press the Surround Select Up/Down buttons. Each press will change to the next surround mode. 3. To change the surround-mode category, press the Surr Mode button. Each press will change to the next surround-mode category. Selecting a Surround Mode Selecting a surround mode can be as simple or sophisticated as your individual system and tastes. Feel free to experiment, and you may find a few favourites for certain sources or program types. You can find more detailed information on surround modes in Audio Processing and Surround Sound, on this page. To select a surround mode, press the OSD Button on the remote to display the Master menu: ** MASTER MENU INPUT SETUP SURROUND MODE MANUAL SETUP SYSTEM SETUP ** Advanced Functions Much of the adjusting and configuration your AVR requires is handled automatically, with little intervention required on your part. You can also customise your AVR to suit your system and your tastes.



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In this section, we will describe some of the more advanced adjustments available to you. Use the Up/Down and OK buttons to select Surround Mode.

*The Surround Mode menu will appear: * MODE : MUSIC * DOLBY PLII MUSIC CENTER WIDTH : 3 DIMENSION : 0 PANORAMA : Off BACK TO MASTER MENU Audio Processing and Surround Sound Audio signals can be encoded in a variety of formats that can affect not only the quality of the sound but also the number of speaker channels and the surround mode. You may also manually select a different surround mode, when available. Analogue Audio Signals Analogue audio signals usually consist of two channels left and right. Your AVR offers two options for analogue playback: DSP Surround Off Mode: The DSP Surround Off mode digitises the incoming signal and applies the bass-management settings, including speaker configuration, delay times and output levels. Select this mode when your front speakers are small, limited-range satellites and you are using a subwoofer. To select this mode, use a digital audio input or turn the Tone Control setting off, then select 2 CH Stereo mode. Analogue Surround Modes: Your AVR is able to process 2-channel audio signals to produce multichannel surround sound, even when no surround sound has been encoded in the recording. Among the available modes are the Dolby Pro Logic II, HARMAN virtual speaker, Logic 7 and 5 CH Stereo modes. To select one of these modes, see Selecting a Surround Mode, on this page. Digital Audio Signals Digital audio signals offer greater flexibility and capacity than analogue signals and allow the encoding of discrete channel information directly into the signal.*

The result is improved sound quality and startling directionality, since each channel's information is transmitted discretely. High-resolution recordings sound extraordinarily distortion-free, especially in the high frequencies. Use the Up/Down and OK buttons to select the desired surround-mode category. Auto Select: For a digital program, such as a movie recorded with a Dolby Digital or DTS soundtrack, the AVR will automatically use the soundtrack's native surround format. For 2-channel analogue and PCM programs, the AVR uses the Logic 7 Movie, Logic 7 Music or Logic 7 Game mode, depending on the source.

Virtual Surround: When only two main speakers are present in the system, you can use HARMAN virtual surround to create an enhanced sound field that virtualises the missing speakers. Stereo: When you want 2-channel playback, select the number of speakers you want to use for playback: "2 CH Stereo" uses two speakers. "5 CH Stereo" plays the left-channel signal through the front left and surround left speakers, the right-channel signal through the front right and surround right speakers, and a summed mono signal through the centre speaker. 20 AVR 156 Surround Modes Surround-mode selection depends upon the format of the incoming audio signal as well as your personal taste. Although there is never a time when all of the AVR's surround modes are available, there is usually a wide variety of modes available for a given input.

Table A9 in the Appendix, on page 30, offers a brief description of each mode and indicates the types of incoming signals or digital bitstreams the mode may be used with. Additional information about the Dolby and DTS modes is available on the companies' Web sites: www.dolby.com and www.dtsonline.com. When in doubt, check the jacket of your disc for more information on which surround modes are available. Usually, nonessential sections of the disc, such as trailers, extra materials or the disc menu, are available only in Dolby Digital 2.0 (2-channel) or PCM 2-channel mode. If the main title is playing and the display shows one of these surround modes, look for an audio or language setup section in the disc's menu.

Also, make sure your disc player's audio output is set to the original bitstream rather than 2-channel PCM. Stop play and check the player's output setting. The channels included in a typical 5.1-channel recording are front left, front right, centre, surround left, surround right and LFE (low-frequency effects). The LFE channel is denoted as ".1" to represent the fact that it is limited to the low frequencies. Digital formats include Dolby Digital 2.0 (two channels only), Dolby Digital 5.1, Dolby Digital EX (6.1), Dolby Digital Plus (7.

1), Dolby TrueHD (7.1), DTS-HD High-Resolution Audio (7.1), DTS-HD Master Audio (7.1), DTS 5.1, DTS 96/24 (5.

1), 2-channel PCM modes in 32kHz, 44.1kHz, 48kHz or 96kHz, and 5.1 or 7.1 multichannel PCM. (Your AVR will downmix the discrete surround back-channel information in 6.

1-channel and 7.1-channel recordings into your system's surround left and surround right channels.) When the AVR receives a digital bitstream, it detects the encoding method and the number of channels, which is displayed briefly as three numbers, separated by slashes (e.g., "3/2/.1"). The first number indicates the number of front channels in the signal: "1" represents a monophonic recording (usually an older program that has been digitally remastered or, more rarely, a modern program for which the director has chosen mono as a special effect). "2" indicates the presence of the left and right channels but no centre channel. "3" indicates that all three front channels (left, right and centre) are present. The second number indicates whether any surround channels are present: "0" indicates that no surround information is present.

"1" indicates that a matrixed surround signal is present. "2" indicates discrete surround left and right channels. (Bitstreams with discrete surround back left and right channel signals will be indicated by a "4," although the AVR downmixes the surround back-channel information into the surround left and right channels.) The third number is used for the LFE channel: "0" indicates no LFE channel. ".1" indicates that an LFE channel is present. Dolby Digital 2.0 signals may include a Dolby Surround flag indicating DS-ON or DS-OFF, depending on whether the 2-channel bitstream contains only stereo information or a downmix of a multichannel program that can be decoded by the AVR's Dolby Pro Logic decoder. By default, these signals are played in Dolby Pro Logic II Movie mode. When a PCM signal is received, the PCM message and the sampling rate (32kHz, 44.

1kHz, 48kHz or 96kHz) will appear. When only two channels left and right are present, the analogue surround modes may be used to decode the signal into multiple channels. If you would prefer a different surround format than the native signal's digital encoding, press the Surround Modes button to display the Surround Modes menu (see Selecting a Surround Mode, on page 20). The Auto Select option sets the surround mode to the native signal's digital encoding,

e.g., Dolby Digital, DTS, Dolby TrueHD or DTS-HD Master Audio.



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